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Foreword

The Annual Conference of the EuroMed Academy provides an international forum for the dissemination of high-quality research and the exchange of ideas among academics, researchers, practitioners, and policymakers. By encouraging multidisciplinary dialogue, the conference promotes the development of new theoretical perspectives, empirical insights, and managerial approaches that contribute to advancing knowledge and addressing contemporary challenges in business and management.

Since its inception, the EuroMed Academy Conference has evolved into one of the leading international conferences in its field. Its growing reputation is reflected in the quality of the research presented, the diversity of its participants, and its increasing international reach. Beyond serving as a venue for presenting research findings, the conference facilitates scholarly debate, fosters international collaboration, and promotes the development of innovative research agendas.

The 19th Annual Conference of the EuroMed Academy welcomed 350 participants from 55 countries, bringing together academics, researchers, practitioners, doctoral students, and policymakers from across the globe. The conference programme reflected a broad spectrum of contemporary research across business, management, economics, marketing, entrepreneurship, innovation, sustainability, digital transformation, and related disciplines.

Maintaining high academic standards remains a fundamental principle of the EuroMed Academy. All papers and extended abstracts included in these Proceedings underwent a rigorous double-blind peer-review process conducted by experts in the respective fields. The accepted contributions represent a diverse collection of empirical, conceptual, methodological, and review studies that advance both scholarly understanding and managerial practice.

We trust that this Book of Proceedings will serve as a valuable reference for researchers and practitioners alike, stimulating further scholarly inquiry, encouraging interdisciplinary collaboration, and contributing to the continuous advancement of business and management research.

Acknowledgements

The successful organisation of the 19th Annual Conference of the EuroMed Academy is the result of the collective efforts and commitment of many individuals and institutions.

We would like to express our sincere appreciation to the Conference Chairs, the Scientific Committee, and the Organising Committee for their dedication, professionalism, and invaluable contribution to the planning and delivery of the conference.

Our special thanks are extended to the Track Chairs and Reviewers, whose expertise and commitment ensured the quality and integrity of the scientific programme. Through a rigorous double-blind review process, they provided constructive evaluations that contributed significantly to the selection and improvement of the papers included in these Proceedings.

We also acknowledge the important contribution of the Session Chairs and Paper Discussants, whose leadership and scholarly engagement enriched the academic discussions and promoted meaningful exchange among participants throughout the conference.

Finally, we extend our sincere gratitude to all authors, presenters, keynote speakers, practitioners, and participants. Their high-quality research, active participation, and willingness to engage in constructive dialogue are the foundation of the EuroMed Academy Conference and continue to strengthen its reputation as a leading international forum for scholarly exchange.

We hope that the collaborations established and the knowledge shared during the conference will continue to generate impactful research and meaningful contributions to both academia and practice in the years ahead.

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UNDERSTANDING GENERATIVE AI ADOPTION AND ITS IMPACT IN PRIMARY EDUCATION: A MULTI-LEVEL ANALYSIS OF EDUCATORS IN CYPRUS

Maria Stylianou and Charalambos Vrasidas

Department of Education, University of Nicosia, Nicosia 2417, Cyprus

Keywords: Generative Artificial Intelligence; Primary Education; Teachers; Technology Acceptance Model; Professional Learning; Educational Technology; Qualitative Case Study

Abstract

Introduction - Purpose and Objectives

This study examines the use, adoption, and impact of generative artificial intelligence (GenAI) in primary education, focusing on how educators integrate GenAI into their professional and pedagogical practice, the factors influencing its implementation, and its pedagogical, professional, and organisational impact within the Cypriot primary education context.

Literature Review and Theoretical Framework

Existing research on GenAI implementation in education has primarily focused on technology acceptance, functional use, and learning outcomes, with limited attention to the dynamic pedagogical, organisational, and context-dependent processes shaping meaningful integration, particularly within primary education and early-adoption education systems such as Cyprus. Furthermore, previous studies have rarely examined how individual, pedagogical, organisational, and systemic factors interact to influence educators' implementation of GenAI and their pedagogical decision-making. To address this gap, the present study adopts an expanded Technology Acceptance Model (TAM), informed by selected constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT).

Methodology and Methods

Drawing on a qualitative case study design, data were collected from fifteen primary school teachers through semi-structured interviews, concurrent think-aloud protocols, and AI-supported lesson-planning artefacts. Data were analysed using inductive thematic analysis and interpreted through an expanded Technology Acceptance Model (Davis, 1989), informed by selected constructs from the Unified Theory of Acceptance and Use of Technology (UTAUT) framework. The analysis examined the individual, organisational, and systemic factors shaping GenAI implementation, moving beyond functional accounts of technology use to provide a richer understanding of educators' professional and pedagogical practice.

Main Findings and Contribution

Findings indicate that primary school teachers integrated GenAI into professional organisation, lesson planning, instructional differentiation, assessment design, multimedia development, and self-directed professional learning. Participants perceived GenAI not as a substitute for professional judgement but as a pedagogical tool requiring continuous evaluation, adaptation, and critical mediation. Meaningful GenAI implementation emerged as a dynamic, multi-level process shaped by the interaction of individual, organisational, and systemic factors,perceived pedagogical value, AI literacy, social influence, leadership, professional learning, institutional support, available time, and broader curricular and policy conditions. Although participants demonstrated increasing professional confidence, pedagogical agency, and reflective practice, sustained implementation depended less on individual willingness than on organisational support, pedagogical guidance, leadership, professional learning opportunities, available time, and coherent institutional policies. GenAI contributed to the transformation of teaching practices by enhancing lesson design, supporting differentiated and inclusive instruction, and fostering student creativity and engagement. At the same time, the findings highlighted ethical concerns, tensions surrounding teacher autonomy and overreliance on AI, and variations in institutional readiness, demonstrating that responsible AI integration requires coherent policies, sustained professional learning, supportive leadership, and equitable access to technological resources.

Originality and Value

This study offers an original contribution by conceptualising GenAI implementation as a pedagogical, organisational, and context-sensitive process rather than merely a functional or technical form of technology acceptance. It advances an integrated conceptual understanding of GenAI implementation by

demonstrating how teacher agency, pedagogical mediation, organisational support, and systemic conditions interact to shape meaningful AI integration. The study also contributes empirical evidence from the underexplored context of Cypriot primary education, an early-adoption education system, providing insights that may inform research, policy, and educational practice in comparable contexts.

Research Limitations

The study is limited by its relatively small sample size and its focus on primary education within Cyprus, which may limit the transferability of the findings to other educational contexts. However, consistent with the qualitative case study approach, the study prioritises depth of understanding and contextual insight over statistical generalisation. Future research could explore GenAI implementation across larger and more diverse samples, different educational levels, and comparative international contexts to further examine the transferability of the proposed conceptual understanding.

Theoretical and Practical Applications/Implications

This study contributes to theory by extending existing technology acceptance research beyond functional and individualistic perspectives, proposing an integrated conceptual understanding of GenAI implementation as a dynamic, multi-level, and context-sensitive process shaped by the interaction of individual, pedagogical, organisational, and systemic factors. The findings further demonstrate that meaningful GenAI implementation depends not only on perceived usefulness and ease of use but also on teacher agency, AI literacy, pedagogical mediation, organisational support, leadership, professional learning, and coherent institutional policies. Practically, the study offers implications for education systems seeking to integrate GenAI responsibly through sustained professional development, supportive leadership, equitable technological infrastructure, and clear governance frameworks. Although grounded in the context of Cypriot primary education, the findings provide insights that may inform policy, research, and educational practice in other education systems undergoing the early stages of GenAI implementation.

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INTELLECTUAL PROPERTY RIGHTS VERSUS PLATFORM USER BASE ON METAVERSE PLATFORMS

Di Nenno, Milena[1]; Naltsidis, Minas[2]

[1]Department of Management, Entrepreneurship and Digital Business, Cyprus University of Technology, Limassol, Cyprus & INNOV-ACTS LTD, Nicosia, Cyprus

[2]Department of Management, Entrepreneurship and Digital Business, Cyprus University of Technology, Limassol, Cyprus

Keywords: Metaverse, Creator Economy, Value Creation, Platform Ecosystems

Introduction

The metaverse is developing as a set of platform ecosystems in which the platform owner integrates metaverse-enabling technologies, while the content that gives these ecosystems their value is produced by the users that the literature defines as creators (Di Nenno et al., 2026; Krüger et al., 2025; Schöbel and Leimeister, 2023). Creator marketplaces on platforms such as Roblox are already worth millions of dollars (Roblox Corporation, 2025; Schöbel and Leimeister, 2023). Evidence remains limited, however, on the conditions under which creators decide to contribute content on a metaverse platform. Previous research emphasises, but does not test, the importance for creators of having control over how their creations are used, shared, and monetised, through Intellectual Property (IP) rights (Jung et al., 2025; Zhou et al., 2018). Moreover, studies show that creators are largely interested in the size of the platform user base, as it defines the potential market for earning revenues on their creations (Jung et al., 2025; Qayyum et al., 2024).

Purpose, Aim and Objectives

Our aim for this research is to test how those two conditions that the literature highlights as important, the size of the platform user base and the strength of intellectual property (IP) rights protection, shape creators' intention to contribute content. We ask what effect user base size and IP rights protection guarantees have on metaverse creators' intention to contribute content (dependent variable, calculated through a three-item scale adapted from (Lee and Shen, 2024), and we test four hypotheses: a main effect of each condition, an interaction between the two, and a dominance effect whereby strong IP rights protection sustains the intention to contribute even when the user base is small.

Literature Review and Theoretical Framework

Metaverse ecosystems depend on creators that are platform complementors, actors who build products and services on top of the platform (Krüger et al., 2025). In traditional platform ecosystems

complementors are usually firms with the resources to build on the platform (Inoue and Tsujimoto, 2018), whereas in the metaverse they include also individual users (Beheshti et al., 2024). Their participation is essential for value creation because their content encourages other actors to join the platform (Ferrigno et al., 2023).

Research on metaverse creators reports that market attractiveness, for which user base size is the clearest indicator, is what creators weigh most when evaluating a platform, since a larger user base widens the market for their creations (Jung et al., 2025). Market potential is weighed against governance risk, because ownership of content created inside the metaverse is unsettled and creators risk seeing their work reused without attribution or appropriated by the platform owner (Zhou et al., 2018). Where complementors are unpaid, or paid less than they expected, the benefit of a large user base may not materialise at all (Boudreau and Jeppesen, 2015), which is why the two conditions have to be examined both separately and jointly.

Methodology and Methods

We conduct a 2x2 between-subjects factorial experiment contrasting user base size (large versus small) and IP rights protection (strong versus weak), because this design separates the effect of each condition from their interaction and supports causal inference. Participants are 128 metaverse creators recruited through Prolific and CloudResearch Connect and screened in a pre-study in which they described the content they produce and the tools they use, so that the survey with the experiment would be sent only to respondents matching the creator profile. The participants are randomly assigned to one condition for each experimental factor: user base size (small vs. large) and IP rights protection (strong vs. weak). We analyse the data collected through factorial ANOVA and independent samples t-tests. We also check whether participants correctly perceived the experimental manipulations, through two independent-samples t-tests on each condition.

Expected Findings and Contribution

First results indicate that creators' intention to contribute responds to IP rights protection and not to the size of the user base, and that this intention stays high under strong IP rights protection even when the user base is small. We expect the completed analysis to confirm that the two conditions do not interact, which would mean that creators assess ownership guarantees on their own rather than jointly with market size. The study contributes empirical evidence on a governance mechanism that metaverse research has discussed without testing, and it suggests to platform owners entering the market that guarantees on content ownership may do more for creator participation than investment in user acquisition.

Research Limitations

The experiment manipulates two conditions only, so it says nothing about monetisation mechanisms, developer tools or onboarding rules. The analysis addresses the aggregate effect across a sample ranging from hobbyists to professionals, so differences between creator types remain untested, and the complexity of what is created may moderate the effect of IP rights protection.

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CAN BRANDS BE TRULY FEMINIST? A CRITICAL ANALYSIS THROUGH THE LENS OF FOURTH-WAVE FEMINISM

Mouskou, Maria

Faculty of Communication and Media Studies, Cyprus University of Technology, Limassol, Cyprus

Keywords: Marketing, Feminism, Fourth-Wave Feminism, Popular Feminism, Feminist Branding, Neoliberal feminism, Poststructuralism, Feminist Critical Discourse Analysis

Abstract

After decades in which feminism was often treated as a "dirty" word, the feminist movement has gained renewed momentum, primarily fuelled by digital activism and what has been described as the fourth wave of feminism (Maclaran, 2015; Cabrera et al., 2021). Pop culture, media, and, following close behind, marketing campaigns appear to have embraced feminist values, such as empowerment, authenticity, gender equality, and more inclusive and intersectional representations of women. However, scholars have raised concerns about the rise of a feminist movement that is being increasingly popularised, commodified, depoliticised and reshaped by neoliberal values and market structures (McRobbie, 2009; Banet-Weiser, 2018; Rottenberg, 2014).

Drawing on the emergent field of fourth-wave feminism, marked by digital activism, intersectionality, and renewed attention to structural inequalities (Cochrane, 2013; Munro, 2013), this research aims to critically interrogate how brands appropriate feminist discourse and whether such appropriations can ever be considered authentic. Fourth-wave feminism offers a valuable theoretical lens for this analysis, because of its focus on inclusivity, intersectional justice and scepticism towards commercialisation (Zimmerman, 2017).

Introduction

The incorporation of feminist messaging in branding is not a new phenomenon. However, the rise of the fourth wave of feminism, alongside the proliferation of feminist discourse on digital platforms and social media, the emphasis on women's empowerment in contemporary media and popular culture, and the commercialisation of feminism calls for a renewed investigation into how marketing and branding engage with feminist values.

After decades of stigma during the postfeminist era of the 1980s through 2000s, in which feminist politics were presented as redundant and unfashionable in a supposedly egalitarian society where patriarchy was perceived as obsolete (McRobbie, 2004), feminism has finally made a comeback as women are once again seeking to challenge global injustices (Maclaran, 2015).

The emergence in the early 2010s of what is now referred to as the fourth wave of feminism, characterised by digital activism, intersectionality, and a renewed attention to structural inequalities (Cochrane, 2013; Munro, 2013), has marked a critical turn away from postfeminist complacency. Fourth-wave feminism is distinguished from previous feminist waves by its use of social media platforms to mobilise campaigns against sexual violence (#MeToo), workplace inequality, body policing, and online misogyny (Munro, 2013; Gill, 2016). In this context, the fourth wave of feminism represents a turning point: it reclaims feminism's political urgency, challenges neoliberal narratives of empowerment, and re-establishes solidarity as a central feminist value.

Although Rivers (2017) has cautioned against declaring the end of postfeminism, she nevertheless has declared the arrival of the fourth wave of feminism by saying "the voices arguing for an openly pro-feminist identity and a 'revival' of feminist politics have begun to be heard, culminating in a swell of activity that could be conceptualised as the arrival of the fourth wave" (p. 25).

This development has been mirrored by a broader embrace of feminism within popular culture and commercial practices. Celebrities such as Beyoncé, Emma Watson, Taylor Swift and

Miley Cyrus made feminism fashionable again by publicly declaring themselves as feminists (Banet-Weiser, 2018; Rivers, 2017). And as feminism gained renewed cultural visibility, brands moved swiftly to align themselves with feminist values. Campaigns such as Dove's 'Real Beauty', Always' #LikeAGirl, and Pantene's #sorrynotsorry adopted feminist branding by seeking to challenge gender stereotypes and empower women.

However, as the cultural and commercial legitimation has made feminism popular again, scholars have raised urgent concerns: Is feminist branding a genuine engagement with feminist goals, or does it represent the commodification and depoliticisation of feminism for commercial gain (Banet-Weiser, 2018)? Scholars such as McRobbie (2009) and Rottenberg (2014) argue that feminism itself has been increasingly reshaped by neoliberal values, promoting individual empowerment at the expense of collective action.

This research project seeks to build upon such critiques by examining whether contemporary branding practices perpetuate postfeminist and neoliberal ideologies, even as they outwardly claim feminist commitments. Drawing on the emergent field of fourth-wave feminism, this doctoral research proposes to critically interrogate how brands appropriate feminist discourses and whether such appropriations can ever be considered authentic.

The lens of fourth-wave feminism offers a dynamic and contemporary framework for assessing whether branded and popular culture representations truly challenge or merely reinforce systemic inequalities, given its focus on inclusivity, intersectional justice, and scepticism towards commercialisation (Zimmerman, 2017).

Research Aim and Questions

Research aim

This research aims to explore and critically assess how brands use feminist narratives for marketing purposes, understand consumer perceptions and analyse these practices in light of fourth-wave feminist theory.

As this doctoral research is in its early stages, the research questions have not yet been finalised. The research questions presented below represent the study's current conceptual direction and will be further developed and refined as the theoretical framework and empirical focus are more clearly defined.

Research questions

1. To what extent do brands include feminist values in their branding and marketing campaigns?
2. To what extent are these campaigns aligned with the principles of fourth-wave feminism?
3. How do female consumers perceive, critically interpret, negotiate and respond to feminist-oriented marketing campaigns and brand narratives?

Literature Review

The literature informing this study spans three intersecting domains: the historical and theoretical development of feminist waves, with particular attention to the emergence and defining characteristics of fourth-wave feminism; the commercialisation of feminist discourse and the rise of feminist branding; and the critical scholarly debates concerning the political consequences of branded feminism, including its relationship to neoliberal ideology, depoliticisation, and intersectional exclusion. This review gives a brief synthesis of these bodies of work.

Postfeminism

Following the suffragette movement of the first wave of feminism and the critique of the patriarchal status quo of the second wave, the third wave of feminism, also known as postfeminism, arrived in the 1990s. McRobbie (2004, 2009) argues that postfeminism neutralised the political force of the feminist movement by presenting feminism as redundant and unfashionable in a supposedly egalitarian society where patriarchy was perceived as obsolete. Postfeminism was not a feminist position but rather a cultural and ideological phenomenon characterised by the "taking into account" of feminism as a historical accomplishment that rendered ongoing feminist politics unnecessary (ibid).

Crucially, Gill (2007) insists that postfeminism is not simply anti-feminist, but operates through an “entanglement" with feminist ideas as it speaks the language of empowerment, choice, and agency but strips these concepts of any of their structural and collective dimensions.

Similarly, Rottenberg (2014) extends this analysis through the concept of ‘neoliberal feminism.’ The neoliberal feminist subject is one who accepts full personal responsibility for her own well-being and advancement, invests in herself as human capital, and understands gender inequality as a problem of individual attitude and effort rather than structural constraint.

Fourth-wave feminism

The emergence of fourth-wave feminism in the early 2010s represented a significant reassertion of feminist politics against the individualising and depoliticising tendencies of both postfeminism and neoliberal feminism. Scholars have identified several defining characteristics of the fourth wave, though, given the contested and internally diverse nature of feminist movements, there is no single authoritative account (Maclaran, 2015; Munro, 2013; Gill, 2016; Cochrane, 2013).

Perhaps online activism has been the most distinctive feature of the fourth wave. Digital spaces have acted as catalysts for the creation of virtual communities, sparking global protests of solidarity and challenging gender stereotypes (The Everyday Sexism Project), sexual violence (#MeToo, #IWillGoOut, “The Rapist is You”), inequalities of power (All Male Panels) and structural inequalities (UK Feminista) (Maclaran, 2015; Munro, 2013; Gill, 2016).

Fourth-wave feminism's embrace of intersectionality represents a significant advance over earlier waves, which were frequently critiqued for centring the experiences of white, middle-class, heterosexual women while marginalising or ignoring those of multiply oppressed groups (hooks, 2000; Crenshaw, 1991; Cochrane, 2013).

Fourth-wave feminism is also characterised by a renewed emphasis on the structural accounts of gender inequality. In explicit contrast to the neoliberal feminist subject described by Rottenberg (2014), fourth-wave feminism reasserts the collective and political dimensions of feminist struggle, seeking changes in law, institutional practice, economic organisation, and cultural norms rather than limiting feminist aspiration to individual self-improvement (Maclaran, 2015; Gill & Orgad, 2018). Hence, the fourth wave's characteristic scepticism toward the empowerment rhetoric, particularly when deployed in commercial contexts (Gill & Orgad, 2015; Rottenberg, 2014).

Popular feminism and feminist branding

As Banet-Weiser (2018) has argued, the early 2010s saw the emergence of what she terms "popular feminism": a form of feminist visibility highly compatible with media culture, celebrity, and consumer capitalism. Many celebrities made high-profile declarations of feminist identity, making feminism culturally fashionable and increasing its mainstream reach (Rivers, 2017). Popular feminism, Banet-Weiser (2018) argues, is characterised by its emphasis on visibility, representation, and inclusion and coexists comfortably with existing capitalist structures. Similarly, Gill and Orgad (2018) argue that branded feminism representations often promote a narrow, individualised form of empowerment compatible with neoliberal values.

Banet-Weiser's (2018) distinction between popular feminism and transformative feminism is central to this study's theoretical framework. Popular feminism, as Banet-Weiser defines it, operates at the level of visibility and representation, concerned with how women are seen, how they feel about themselves, and whether feminist voices are heard within mainstream culture. However, visibility does not necessarily lead to structural change. Popular feminism coexists comfortably with capitalism, because it does not challenge the economic structures within which commercial culture operates. Transformative feminism, by contrast, is oriented toward the structural change of the economic, legal, and cultural institutions that reproduce gender inequality.

Critical perspectives

The most sustained critique of feminist branding centres on its relationship to neoliberal ideology. McRobbie (2009) and Rottenberg (2014) have demonstrated that commercial feminist discourse consistently displaces the collective, political dimensions of feminism in favour of individualistic narratives of self-empowerment. The feminist subject constructed by brands is typically one that overcomes personal self-doubt, feels more empowered and confident and achieves success by adopting the right (branded) attitude and buying the right product. Structural inequalities, such as discrimination, pay gaps, institutional and sexual barriers, are largely absent from this narrative or are seen as something to individually overcome.

Rottenberg (2014) argues that this individualisation reflects an ideological transformation where the feminist subject adopts a neoliberal rationality. As such, feminist branding not only fails to strengthen feminist values, but also actively reproduces and normalises neoliberal values.

Closely related to the neoliberal critique is the argument that feminist branding systematically depoliticises feminist discourse. Gill and Orgad (2015, 2018) have developed the concept of a "confidence culture" to describe contemporary discourse, including self-help literature, media representations, corporate wellbeing programmes, and advertising, that tells women to "lean in," to be more assertive, to project confidence, to overcome imposter syndrome. The implication is that gender inequality persists not because of structural barriers but because women lack the psychological resources to succeed.

Maclaran (2015) extends this analysis to the marketing context, arguing that brands have enthusiastically adopted feminist rhetoric precisely because the individualised empowering rhetoric they present feminism to be is compatible with consumerism: buying the right product becomes an act of feminist self-expression.

Finally, as Zimmerman (2017) and Cochrane (2013) argue, branded feminist campaigns have systematically been focused on white, middle-class, heterosexual, and able-bodied women

while marginalising or ignoring women at the intersections of multiple other identities. This is not merely a representational failure, but an ideological one: by implicitly constructing white, middle-class femininity as the norm of feminist experience, feminist branding reproduces the very exclusions that fourth-wave feminism seeks to dismantle.

Methodology

In order to fully address the research questions, this research adopts a feminist post-structuralist approach in line with Maclaran's (2015) call for market and consumer research to move beyond simplistic empowerment narratives and instead engage with feminist theory as a critical and political tool that examines how feminist discourse is constructed, circulated and contested.

Feminism is approached not as a stable ideology but as a contested discourse shaped by cultural, political, and economic forces (McRobbie, 2009; Rottenberg, 2014). In line with fourth-wave feminism scholarship, particular attention is paid to intersectionality, digital mediation, and the tensions between feminist politics and neoliberal market logics (Munro, 2013; Maclaran, 2015; Banet-Weiser, 2018).

To address the research questions at multiple analytical levels, the study is structured around three interrelated methodological components: Critical Discourse Analysis, Qualitative Interviews, and Focus Groups. Together, these methods enable an examination of feminist branding as both a discursive practice and a lived, interpreted experience.

For all three methods, a purposive sampling approach is adopted as this research aims for analytical results that contribute to theory rather than statistical generalisations. As this research is qualitative and interpretive in nature, the goal is to contribute to theoretical insights rather than universal claims. As such, a purposive sampling approach, where case studies are selected based on relevance rather than statistical representation, is more appropriate.

Critical Discourse Analysis

Critical Discourse Analysis (Fairclough, 1995; Lazar, 2005) will be used to examine how gendered identities, empowerment discourses, and feminist values are constructed in selected case studies, such as advertisements, social media content and film portrayals that incorporate feminist rhetoric.

Critical Discourse Analysis (CDA) constitutes the primary analytical tool for examining how feminist values are articulated within marketing and popular culture texts. Drawing on Fairclough's (1995) understanding of discourse as both socially constitutive and ideologically loaded, the study employs Feminist Critical Discourse Analysis (FCDA) to foreground questions of gender, power, and inequality (Lazar, 2005).

This approach is particularly appropriate given feminist scholars' critiques of postfeminist and neoliberal appropriations of empowerment discourse, which often reframe structural inequalities as individual responsibilities (McRobbie, 2004; Rottenberg, 2014). FCDA allows for a systematic interrogation of how feminist language and imagery may signal progressiveness while simultaneously reproducing depoliticised or market-friendly versions of feminism (Gill, 2016; Gill & Orgad, 2018).

A purposive sample of high-visibility case studies will be selected for their explicit engagement with feminist themes and prominence in public discourse. Through this analysis, the study will assess whether branded feminist narratives meaningfully align with fourth-wave feminism principles or whether they reproduce postfeminist and neoliberal logics under the guise of empowerment rhetoric (Maclaran, 2012; Banet-Weiser, 2018).

Qualitative interviews

A number of semi-structured qualitative interviews will be conducted with self-identified women to explore how consumers interpret and respond to feminist branding at the level of individual meaning-making. This method is particularly suited to capturing the complexity, ambivalence, and reflexivity that characterise contemporary engagements with feminism (hooks, 2015; Gill, 2016).

Participants will be recruited through purposive sampling, with a primary focus on self-identified women. Interviews will invite participants to reflect on specific examples of feminist-oriented branding and media, including both globally recognisable campaigns and content encountered in their everyday lives. Key themes will include perceptions of authenticity, emotional responses, ethical concerns, feelings of inclusion or exclusion, and understandings of empowerment and solidarity. Interview data will be transcribed and analysed thematically using NVivo qualitative data analysis software.

Focus groups

A number of focus groups will be conducted to collect additional data to help answer the research questions. Focus groups will be utilised to investigate how brand narratives are collectively interpreted, negotiated, contested or legitimised through social interaction.

Participants will be organised into relatively homogeneous groups based on age or cultural context (to be determined) to facilitate open discussion. Each session will be structured around selected visual and textual prompts, such as advertisements, social media posts, or short media clips with explicit feminist messages.

While interviews explore individual experiences, focus groups enable the exploration of shared meanings, disagreement, and social norms surrounding feminist discourse (Gill & Orgad, 2018). Discussion will focus on how participants collectively evaluate feminist claims, articulate scepticism or endorsement, and negotiate tensions between feminist ideals and commercial motives. This method is particularly valuable for examining how feminist meanings circulate within popular culture and how they are reinforced or challenged through social interaction (Gill, 2016; Banet-Weiser, 2018).

The data gathered from the focus groups will be analysed thematically using NVivo qualitative data analysis software, similar to the interviews.

Expected Outcomes

This research is expected to make several contributions to feminist marketing scholarship. It aims to develop an analytical framework grounded in fourth-wave feminist theory to evaluate the authenticity of contemporary feminist branding practices. Through Critical Discourse Analysis, it aims to contribute to the debate of how brands appropriate feminist language while potentially reinforcing neoliberal ideologies of individual empowerment.

Furthermore, through the analysis of qualitative data from the interviews and focus groups, it seeks to reveal the complex ways in which women navigate, resist, or embrace commodified feminism, offering a deeper understanding of consumer agency within capitalist structures.

Ultimately, this research aims to contribute to the critical debate on the limits and possibilities of corporate feminism, offering conceptual tools to distinguish between superficial feminist appropriation and more substantive engagement with feminist values. In doing so, it will contribute to the ongoing debate between feminism and marketing on whether brands can meaningfully align themselves with feminist politics within neoliberal market structures (Maclaran, 2012; Gill & Orgad, 2018).

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BEYOND RAINBOW-WASHING: RECONCEPTUALISING AUTHENTIC BRAND ACTIVISM AND LGBTQI+ CONSUMER WELL-BEING

Georgiou, Panos

Department of Business Administration, EUC, Nicosia, Cyprus

Keywords: Rainbow-washing, CSR (Corporate Social Responsibility), CRM (Cause-related marketing), Authentic Marketing, Brand Activism, DEIB, LGBTQI+, Well-being.

Introduction

Corporate sociopolitical activism (CSA) increasingly targets LGBTQI+ communities through Pride partnerships, rainbow branding and inclusion-themed campaigns (Montecchi et al., 2024) yet rainbow-washing describes a brand's use of LGBTQI+ symbols and Pride-related imagery primarily to signal support in advertising, without matching actions or commitments to LGBTQI+ rights (Allen and Wanjugu, 2026). While brand activism has lately gained significant attention (Ahmad et al., 2024) and such initiatives are often presented as unequivocal expressions of solidarity, critics highlight how rainbow-washing allows organisations to instrumentalise LGBTQI+ symbols and identities for commercial gain while maintaining ambiguous or contradictory organisational practices (Tressoldi et al., 2024; Schulman, 2021).

Brands have responded to consumer desires by increasingly integrating pro-LGBTQI+ initiatives in branding efforts over the last decade (Allen and Wanjugu, 2026). Rather than treating these campaigns as purely exploitative, recent scholarship conceptualises them as relations of "constitutive impurity", where commercial, political and community interests are inevitably entangled, and where both harm and well-being-enhancing outcomes are possible (Christensen et al., 2025). Despite growing scholarship on rainbow-washing and brand activism, there remains limited understanding of how these impure marketing arrangements shape LGBTQI+ consumer well-being across psychological, emotional and social dimensions (Powell et al., 2024). This study addresses that gap by examining how authentic LGBTQI+-oriented cause-related marketing builds bridges of trust, recognition and future cooperation instead of scepticism and detriment.

Aim and Objectives

This research aims to critically examine the impact of rainbow-washing on LGBTQI+ consumer well-being, analysing its psychological, emotional and social effects, particularly as manifested through consumer scepticism, engagement and trust. Additionally, it examines the relational and contextual conditions under which LGBTQI+-oriented activism fosters trust, mutual learning and cooperation, and when it instead reproduces scepticism and harm. The study is guided mainly by the following objectives: to assess the emotional, psychological and social impact of rainbow-washing on LGBTQI+ consumer well-being; to analyse how rainbow-washing affects consumer scepticism, engagement, trust and brand perception within diverse LGBTQI+ communities; to investigate the ethical dimensions of rainbow-washing within the CSR context; to evaluate whether authentic marketing can serve as an ethical branding approach that enhances LGBTQI+ consumer trust, engagement, belonging and well-being; and ultimately to develop and empirically refine a conceptual framework that links rainbow-washing, authenticity, engagement, trust and well-being.

Literature Review and Theoretical Framework

Diversity-washing is a more complex and context-dependent issue than other forms of CSR-washing (Beckert and Koch, 2025). It can be defined as the act of expressing support for a sociopolitical issue either through theoretical discourse or by presenting a concrete action plan, but subsequently failing to implement that action plan or to address the same issue happening within the organisation (Ahmad et al., 2024). Diversity-washing refers to situations in which an employer presents an outward image of inclusivity, while internally lacking concrete measures, systematic engagement with equality, or tangible results (Rudžiková, 2025). Pinkwashing originated as a critique of deceptive cause-related marketing in breast-cancer campaigns (Blackmer, 2019) and has since been extended to geopolitical and policy contexts (Conway and Edenborg, 2025). Subsequently, rainbow-washing is where LGBTQI+ rights are instrumentalised to deflect criticism or legitimise contested agendas (Beckert and Koch, 2025). Such performative gaps erode consumer trust. When inconsistencies between marketing messages and actual corporate practices come to light, rainbow-washed promotions are perceived as misleading and significantly damaging brand credibility particularly amongst well-informed consumers. (Hall et al., 2024). Equipped with awareness of these practices, consumers are likely to receive woke-branded advertising with heightened suspicion and scepticism (Caruelle, 2025).

Diversity efforts may be criticised by consumers who are supportive of the cause, but question the brand's authenticity (Campbell et al., 2025). Turner *et al.*, (2024) found that LGBTQI+ audiences are particularly critical of what they perceive as rainbow-washing, emphasising the need for brands to engage in more substantive and authentic forms of activism. If the inclusivity efforts are perceived as inauthentic or opportunistic, consumers may develop a more negative attitude (Allen and Wanjugu, 2026). Perceived authenticity partially mediates the relationship between inclusivity values and trust. In other words, when consumers perceive a firm to have strong inclusivity values, consumers are also more likely to perceive high authenticity and trust the firm more and also to hold a more positive attitude toward the same (Allen and Wanjugu, 2026). All of these conditions touch elements of consumers' lives and their experiences of the marketplace. They reaffirm the importance of recognising the complexities of how gender, sex, and sexuality interrelate and inform consumer well-being, intersecting with other markers of social locations (Steinfield et al., 2024).

There are many reasons why well-being matters (Lambert et al., 2020). Consumer well-being is conceptualised as multidimensional (psychological, emotional and social) and increasingly treats it as a core ethical benchmark for marketing and CSR, particularly for marginalised groups (Powell et al., 2024). Harmful issues identified include erasure of community voices, instrumentalization of identities, diversion from accountability and socio-psychological harm (Schulman, 2021). These conditions have detrimental impacts on well-being, which are magnified for those who already face other disadvantages for example lower socioeconomic power, racial and/or disability biases and lack of citizenship status (Steinfield et al., 2024). Yet there is a lack of understanding about how damaging each one of them is (Ahmad et al., 2024). While this question has been answered by many researchers, a recap is helpful for those who remain unconvinced of its necessity as a matter of policy and global research (Lambert et al., 2020). Thus, it's becoming imperative for companies to grasp how consumers perceive and engage with diversity, whether it be in a positive or negative manner (Campbell et al., 2025).

While brand activism can entail short to medium-term financial costs, sustained and substantive engagement with ethical and moral issues over time can mitigate perceptions of hypocrisy and strengthen brand equity (Anisimova et al., 2025). In addition, future research can further deepen the use of psychological theories in consumer studies of diversity and inclusion (DEIB) thereby informing more inclusive marketing practices (Branca et al., 2024). Drawing on relational ethics of constitutive impurity (Christensen et al., 2025), pride partnerships and LGBTQI+ cause related marketing (CRM) are conceptualised as inherently hybrid

arrangements in which commercial, political and community interests are entangled, and where both harm and well-being-enhancing outcomes are possible. Consequently, authentic marketing is treated as a relational, normative orientation within these impure arrangements, grounded in accuracy, integrity, continuity and the fulfilment of brand promises (Nunes et al., 2021; Schallehn et al., 2014). On this basis, the present study adopts a constructivist grounded theory (CGT) approach that foregrounds LGBTQI+ consumers as situated, critically literate agents who interpret, negotiate and contest these impure arrangements under structural power asymmetries.

Methodology and Methods

The research employs CGT with an abductive reasoning approach, acknowledging that preliminary conceptual frameworks exist but require empirical refinement through engagement with LGBTQI+ consumer experiences. Phase one comprises a systematic literature review (SLR) conducted across Scopus and EBSCO using five main keyword clusters: (i) rainbow-washing; (ii) brand activism and CSR ; (iii) authenticity (iv) DEIB and well-being; and (v) LGBTQI+ consumer identity. Initial searches retrieved 4,100 records (Scopus) and 4,651 records (EBSCO). Applying database-specific filters, last ten years, journal articles, English language, full text and peer-reviewed, reduced the yield to 645 (Scopus) and 1,692 (EBSCO), producing a combined pool of 2,337 records. Deduplication removed 122 items, yielding a corpus of 2,215 records (Scopus: 592; EBSCO: 1,623). Title-based screening against inclusion criteria reduced this to 721 articles (Scopus: 207; EBSCO: 514); abstract-based screening against exclusion criteria further reduced the corpus to 507 records (Scopus: 141; EBSCO: 366).

The study is currently at the full-text review stage, with remaining articles being assessed for final inclusion and thematic synthesis. Phase two comprises approximately 20 in-depth semi-structured interviews (60–90 minutes) with LGBTQI+ consumers recruited via purposive, theoretical and snowball sampling to capture intersectional diversity across age, gender identity, sexual orientation, ethnicity and geography. Analysis follows CGT protocols of open, axial and selective coding, assisted by ATLAS.ti, using constant comparison, theoretical memo-writing and iterative category refinement until theoretical saturation (Charmaz and Thornberg, 2021; Sebastian, 2019; Morse et al., 2016; Goulding, 2006).

Significance and Contribution

This study advances marketing theory by apprehending how rainbow-washing and more authentic LGBTQI+ cause-related marketing shape scepticism, trust, engagement and well-being, shifting attention from firm-level outcomes to the lived experiences of marginalised consumers (Montecchi et al., 2024). It enriches LGBTQI+ marketing and consumer-well-being scholarship by centring diverse voices and clarifying when "authentic" initiatives function as ethical, well-being-enhancing bridges and when they reproduce harm (Christensen et al., 2025), while offering practitioners evidence-based guidance to distinguish substantive allyship from opportunistic campaigns in a context of heightened scrutiny and documented corporate retreat from LGBTQI+ support (Conway and Edenborg, 2025). The research is original in integrating rainbow-washing, authentic brand activism and LGBTQI+ consumer well-being within a single theoretically driven and empirically grounded model that reconceptualises brand activism through an LGBTQI+ lens, examining how cause partnerships in contested sociopolitical domains expose consumers to backlash, withdrawals of support and symbolic gestures that may harm rather than help.

Emerging Theoretical Insights and Limitations

The SLR, currently at the full-text review stage, points to several emergent theoretical positions. Organisations that engage in LGBTQI+-oriented CSA must develop meaningful, reciprocal relationships with historically marginalised communities, and authenticity is fundamental to this process (Ciszek and Lim, 2021). Critically, perceived authenticity appears to mediate the relationship between an organisation's LGBTQI+ communication and the quality of its organisation-public relationships, meaning that symmetrical communication strategies only generate trust when consumers perceive them as genuine rather than performative (Allen and Wanjugu, 2026; Ciszek and Lim, 2021). This suggests that the structural conditions of organisational practice such as inclusive recruitment, supplier diversity and internal equity policies, are not peripheral to marketing authenticity but constitutive of it (Roberson et al., 2024).

The primary limitation of this study at its current stage is that Phase one (SLR) remains incomplete, and Phase two (qualitative interviews) has not yet commenced. Theoretical propositions are therefore provisional and subject to revision following full-text synthesis and empirical engagement with LGBTQI+ consumer experiences.

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TITLE
BLOCKCHAIN TECHNOLOGY AS A STRATEGIC ENABLER OF BUYER-SUPPLIER RELATIONSHIPS IN THE FOOD SUPPLY CHAIN

El Naddaf, Sami[1]

[1]Antonine School of Business, Antonine University, Lebanon

Keywords: Blockchain Technology, Ethical Practices, Unethical Practices, Food Supply Chain, Technology, Food Fraud, Consumer Behavior.

Introduction

Blockchain technology (BCT) has emerged as a potential solution for improving transparency, traceability, security, and trust in supply chain management. Recent studies indicate that BCT can improve traceability and transparency through immutable records and secure information exchange (Ellahi et al., 2024; Karaduman and Gülhas, 2025), while also strengthening supply chain resilience and risk management (Zhou, 2024). These characteristics are particularly relevant to Lebanon, where recurring food scandals, food-safety concerns, and weaknesses in regulatory enforcement continue to affect consumer confidence.

Purpose, Aim and Objectives

The study aims to investigate the role of BCT in shaping buyer-supplier relationships in the food supply chain, with particular focus on ethical practices, transparency, and trust. It examines the impact of BCT on buyer-supplier relationships, traceability, and trust; explores its influence on consumer behaviour; develops a theoretical framework for BCT adoption in the food industry; and provides practical recommendations for enhancing ethical practices, particularly within the Lebanese context.

Literature Review and Theoretical Framework

Blockchain solutions can facilitate direct transactions between trading partners, support asset tracking, and strengthen the provenance of supply-chain data (Lacity, 2018). In the agri-food sector, BCT has also been identified as a potential sustainable business model innovation, highlighting its broader strategic relevance for supply chain management (Tiscini et al., 2020). However, the influence of BCT on the design and management of supply chains remains under-researched, particularly regarding buyer-supplier relationships and emerging economies. Earlier research also identified limited theoretical and empirical investigation of blockchain adoption in

food supply chains (Wang, 2018). The study therefore connects BCT with buyer-supplier relationships, trust, transparency, traceability, and ethical practices.

Methodology and Methods

The research focuses on the Lebanese food industry, where food-safety concerns, unethical practices, fragmented regulatory oversight, and trust-related challenges provide an appropriate context for investigating BCT. The study investigates buyer–supplier relationships and the challenges surrounding transparency, traceability, trust, and ethical behaviour.

Findings and Contribution

The study provides insights into how BCT may influence buyer–supplier relationships by improving the visibility, reliability, and traceability of information across the food supply chain. Its contribution focuses particularly on the potential of BCT to strengthen trust, enhance transparency, support ethical practices, and reduce opportunities for information manipulation and unethical behaviour.

Originality and Value

The originality of the research lies in examining BCT not only as a technological mechanism for improving efficiency and traceability, but also through its relationship with trust, ethical practices, and buyer-supplier relationships. Limited research has investigated these relational and ethical dimensions within the food industry of an emerging economy such as Lebanon.

Research Limitations

The study focuses specifically on the Lebanese food industry; therefore, economic, regulatory, cultural, and technological characteristics may limit the generalizability of its findings. Differences in technological readiness and levels of BCT adoption may also influence the applicability of the proposed framework.

Theoretical and Practical Applications and Implications

Theoretically, the study contributes to BCT and supply chain literature by integrating technology with trust, transparency, traceability, ethical practices, and buyer-supplier relationships. Practically, the findings may assist manufacturers, suppliers, buyers, policymakers, and governmental bodies in evaluating BCT as a mechanism for strengthening accountability, ethical practices, traceability, and stakeholder confidence within food supply chains.

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THE SUSTAINABILITY–RESILIENCE PARADOX IN TOURISM: A SYSTEMS-BASED SOCIOLOGICAL CONCEPTUAL FRAMEWORK

Maráková, Vanda[1]; Očkaik, Branislav[1]

[1]Department of Tourism, Faculty of Economics, Matej Bel University in Banská Bystrica, Banská Bystrica, Slovakia

Keywords: Tourism Resilience, Sustainable Tourism, Systems Theory, Consumer Behaviour, Structuration Theory, Social Capital, Sustainability Paradox, Tourism Systems.

Introduction

Tourism systems increasingly experience environmental, economic and global uncertainties (Hall, Prayag and Amore, 2018; Wang et al., 2025). Therefore, resilience is a major area of interest in research and policy (Farsari, 2021). The primary assumption is that the promotion of sustainable behaviours among visitors will contribute to resilient tourism systems (Mandic et al., 2025). Despite increased awareness about sustainability issues in tourism, however, structural vulnerabilities (such as overtourism, and environmental pressures) still exist (Hartman, 2023; Sebastian Raimondo, Biondani and Giupponi, 2026). This means there is an imbalance between interventions focused on changing the behaviour of visitors and the desired system level results. This study conceptualizes this imbalance as the sustainability-resilience paradox. The sustainability-resilience paradox illustrates the conflict between the need to encourage behaviour change and the limited ability of behaviour change to produce resilience.

Purpose, Aim and Objectives

The study builds on the premise that resilient tourism destinations require sustainable visitor behaviour, which can only be achieved when tourism systems provide the structural, institutional, and social conditions that enable such behaviour. Accordingly, the study examines the relationship between visitor behaviour and tourism resilience to explain why behavioural change alone rarely produces resilient tourism systems. The purpose is to (1) reconceptualise resilience as an emergent system property, (2) position visitor behaviour within a complex tourism system, and (3) explain how system interactions condition the effectiveness of sustainable visitor behaviour.

Literature Review and Theoretical Background

Research on sustainable tourism has predominantly focused on promoting behavioural change, while studies on the attitudinal–behavioural gap demonstrate that pro-environmental values do not consistently translate into sustainable practices (Huang and Wang, 2024; Mandic et al., 2025). These perspectives primarily examine individual behaviour and provide limited explanation of the systemic conditions under which such behaviour contributes to tourism resilience. To address this gap, the present study integrates systems theory, Giddens' structuration theory, and Bourdieu's concept of social capital (Whittington, 2015; Pimentel, 2017). Systems theory conceptualises tourism as a complex adaptive system in which resilience emerges from interactions among interconnected subsystems (Hall, 2018; Farsari, 2021; Wang et al., 2025). Structuration theory explains how individual behaviour is simultaneously enabled and constrained by structural and institutional conditions, while social capital highlights the role of trust, networks, and social norms in supporting collective adaptation. Together, these perspectives provide the theoretical basis for the concept of system alignment, through which sustainable visitor behaviour can contribute to tourism resilience.

Methodology and Methods

The study adopts a conceptual research design based on an interdisciplinary qualitative synthesis of tourism resilience, systems theory, and sociological literature. The purposive literature search was conducted using the Web of Science and Scopus databases, with Google Scholar used to identify additional peripheral and seminal works. Only peer-reviewed journal articles were considered, except for foundational theoretical contributions where original books or book chapters constituted the primary source. The synthesis identifies recurring theoretical relationships concerning resilience, visitor behaviour, and systemic conditions to develop an integrated conceptual framework. This allowed the development of a systems-based conceptual framework introducing system alignment as the condition under which sustainable visitor behaviour contributes to tourism resilience. The study therefore aims to advance theory and provide a foundation for future empirical testing.

Results and Originality

The study proposes a systems-based framework in which tourism resilience emerges from the interactions among economic, infrastructure, governance, social, and demand subsystems. Within this framework, visitor behaviour is recognised as a necessary but conditional contributor to resilience. The study introduces system alignment as a multidimensional construct comprising structural (e.g., accessibility, pricing), institutional (e.g., governance,

policy), and social (e.g., norms, social capital) conditions that enable or constrain sustainable behaviour. When system alignment is weak, sustainable visitor behaviour is unlikely to translate into resilient tourism outcomes, giving rise to the sustainability–resilience paradox. Accordingly, behavioural change alone is insufficient, as resilience depends on the alignment of interacting tourism subsystems.

Value Added and Originality

The study provides new information by introducing the concept of sustainability-resilience paradox and by defining system alignment as a condition for the effectiveness of behaviour. The study contributes to the research field by moving from the analysis of determinants of behaviour to the analysis of the conditions under which behaviour affects resilience.

Limitations of the Study

The study is conceptual. There is no empirical verification of the conclusions presented. The conclusions are based on a synthesis of literature. Literature synthesis has a risk of being subjective. The generalization of the findings of the study is therefore limited.

Implications of the Study

The study conceptualises resilience as a system property that is dependent on multiple alignments. The study recommends that the implementation of coordinated interventions across structural, institutional and social dimensions are required for the establishment of the resilience of tourism. The study supports the idea that behavioural change remains relevant. However, it is only effective in a system where the behaviour of visitors is aligned.

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AI-MEDIATED ETHICAL LEADERSHIP IN SERVICE ECOSYSTEMS: H2H MARKETING, TRUST, BRANDING AND THE HUMAN FILTER

Katsamba, Katerina[1]; Pfoertsch, Waldemar[1]

[1]CIIM Business School, University of Limassol, Limassol, Cyprus

Keywords: Human-centred AI; H2H Marketing; ethical leadership; service ecosystems; branding; trust; Human Filter; AI-mediated decision-making.

Introduction

Artificial intelligence is increasingly embedded in service ecosystems, where it filters attention, frames choices, recommends actions and participates in the construction of value, trust and legitimacy. Yet AI can mediate influence in ways that weaken human judgement, brand authenticity and ethical responsibility. Existing AI ethics frameworks do not fully explain how AI influence should be interpreted, governed and ethically filtered in service and brand contexts (Floridi and Cowls, 2019). Human oversight may remain nominal — a human may be formally in the loop while failing to exercise meaningful judgement (Elish, 2019). This paper argues that service ecosystems require a deeper form of ethical leadership: the Human Filter.

Purpose, Aim and Objectives

This paper develops the concept of AI-mediated ethical leadership by integrating Human-to-Human (H2H) Marketing (Kotler, Pfoertsch and Sponholz, 2021), service-dominant logic (Vargo and Lusch, 2016), ethical leadership and AI trust scholarship. It proposes the AAA framework — Attunement, Alignment and Ascendence — and positions the Human Filter as the unifying leadership capacity that interprets, questions and ethically evaluates AI outputs before these become service decisions, brand actions or institutional messages. A critical empirical gap is identified: limited research examines how leaders exercise ethically loaded service and brand judgement in the presence of AI systems.

Literature Review, Theoretical Framework and Conceptual Model

H2H Marketing places human beings, trust and value co-creation at the centre of marketing activity. In AI-mediated service ecosystems, however, AI systems act as mediating actors — structuring what becomes visible, which options appear relevant and which decisions seem

legitimate — without bearing moral responsibility for those effects. This causal-moral asymmetry is the paper's central problem.

The AAA framework addresses it through three mechanisms. Attunement: the capacity to recognise ethically and relationally salient information beyond predictive data — perceiving what AI misses when customers seek human accountability (Crolic et al., 2022). Alignment: governance boundaries ensuring AI influence remains consistent with organisational values and stakeholder dignity; mandated oversight without cultivated capacity produces moral crumple zones rather than genuine accountability (Elish, 2019). Ascendence: the ability to engage AI outputs reflectively, so that AI prompts better judgement rather than passive dependence.

The Human Filter unifies these mechanisms as the H2H Mindset enacted as interpretive leadership and distributed organisational capability: the capacity to question, contextualise and ethically evaluate AI-generated outputs before they become service decisions, brand actions or institutional messages.

Methodology and Methods

A phased strategy is proposed: qualitative interviews with service and brand leaders; survey research measuring AAA constructs using adapted scales from ethical leadership (Brown and Treviño, 2006) and AI trust scholarship; and scenario-based experiments varying AI output framing, transparency and ethical salience.

Main Findings, Originality and Value

Five propositions are advanced: Attunement predicts ethical awareness; Alignment predicts brand trust; reflective AI prompts increase willingness to challenge outputs; Human Filter capacity predicts stakeholder confidence; and psychological safety strengthens responsible AI use. Contributions span H2H Marketing theory, service-dominant logic, ethical leadership and branding — positioning the Human Filter as a measurable and trainable capability for responsible service innovation.

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AI CHATBOTS IN CUSTOMER COMMUNICATION: A SYSTEMATIC LITERATURE REVIEW

Valová Henrieta[1]; Táborecká Janka[2]

[1]Faculty of Economics, Matej Bel University in Banská Bystrica, Slovakia

[2]Faculty of Economics, Matej Bel University in Banská Bystrica, Slovakia

Keywords: Artificial Intelligence, Chatbots, Customer Communication, User Experience, Technology Acceptance, AI Adoption

Introduction

Artificial intelligence is increasingly transforming customer communication by enabling companies to automate service processes, provide real-time responses and personalize interactions through chatbots, voice assistants and generative language models. At the same time, their implementation raises challenges related to trust, ethical issues and user acceptance. Existing research remains fragmented, with individual aspects of human-chatbot interaction frequently examined in isolation (Rapp et al., 2021).

Purpose, Aim and Objectives

The aim of this literature review is to systematically map existing knowledge on the use of AI and chatbots in customer communication and to identify the main thematic directions, theoretical approaches, methodological trends and research gaps shaping the field. Particular attention is paid to technology acceptance, customer experience, satisfaction, trust, anthropomorphism and human-AI interaction.

Literature Review and Theoretical Framework

Prior research commonly draws on established technology acceptance models, especially TAM and UTAUT, to explain users' behavioral responses and chatbot adoption. Perceived usefulness, ease of use and trust are repeatedly identified as important determinants of adoption (Pillai & Sivathanu, 2020). More recent studies increasingly emphasize customer experience, satisfaction and continued chatbot use, indicating a shift toward broader interactional and psychological perspectives (Nguyen & Le, 2025).

Methodology and Methods

Scopus served as the primary database, while Web of Science and ResearchGate were used as supplementary sources. Searches combined keywords related to AI, chatbots, customer communication, customer experience, technology acceptance, trust, personalization and automation. Approximately 1,100 records were initially identified. After title and abstract screening and the exclusion of studies not directly related to AI and chatbots in customer communication, 122 scientific articles published within the last five years were retained. References were managed in Zotero. Keyword co-occurrence analysis was conducted in VOSviewer, followed by content analysis to refine the thematic categorization.

Findings and Contribution

The VOSviewer analysis identified six interconnected clusters, which were subsequently refined into seven thematic categories. The greatest research attention was devoted to user experience, satisfaction and trust (21.31%), followed by anthropomorphism and human-AI interaction (18.85%), technology acceptance factors and intention to use AI tools (18.03%), and technological development and AI models (17.21%). Additional categories included automation of customer communication using AI (12.30%), chatbots in marketing communication and customer engagement (9.02%), and ethical, security and privacy aspects of AI use (3.28%).

Methodologically, prior research strongly favors quantitative, model-driven designs. Survey-based studies are most common, while qualitative and mixed-method approaches remain comparatively underrepresented. SEM and PLS-SEM are the most frequently applied analytical techniques. The synthesis shows that technological and adoption-related aspects are well developed, but customer perspectives are often examined in a partial and static manner. Relationships among user experience, satisfaction and trust, the effects of repeated chatbot use, the boundary between beneficial and counterproductive anthropomorphism, and the integration of ethical and privacy concerns remain insufficiently explored.

Originality And Value

The review integrates thematic and methodological perspectives to provide a structured overview of current AI chatbot research in customer communication. It also identifies a significant geographical gap, as research is concentrated mainly in Asia and the United States, while evidence from Central Europe and Slovakia remains limited.

Research Limitations

The scope of the review is defined by the selected databases and by its focus on studies published within the last five years.

Theoretical and Practical Applications and Implications

The findings provide a theoretical foundation for more comprehensive empirical research integrating technological, interactional and user-centered dimensions of chatbot use. They also highlight the need for context-specific research on customer perceptions, experiences and attitudes toward AI chatbots, particularly in underrepresented settings such as Slovakia.

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ACCEPTANCE OF METAVERSE TECHNOLOGY ALONG THE TOURIST JOURNEY

Vaneková, Beáta; Gajdošík, Tomáš
Faculty of Economics, Matej Bel University, Banská Bystrica, Slovakia

Keywords: Metaverse, Tourism, Purchasing Behavior, Virtual Reality, Visitor Experience, Digital Technology, Immersion, Visitor Journey

Introduction

The rapid development of immersive digital technologies, especially the metaverse, is creating new opportunities for transforming decision-making processes and visitor experiences in tourism (Kılıçarslan et al., 2024). The metaverse enables interactive virtual environments based on virtual reality, augmented reality and artificial intelligence technologies that connect the physical and digital worlds (Lee et al., 2021). Despite the growing interest in the potential of the metaverse in tourism in the academic literature, there is still a lack of empirical research focused on its acceptance in the individual phases of the tourist journey (Sánchez-Amboage et al., 2024).

Purpose, Aim and Objectives

The aim of this paper is to examine the acceptance of metaverse technology in tourism from the perspective of the individual phases of tourist journey. Attention is focused on the perception of the metaverse on pre-travel decision-making, its role in shaping on-site experiences and its impact on post-visit reflection and willingness to recommend, while also identifying practical opportunities for its effective use throughout the visitor journey. The research is based on the Technology Acceptance Model (TAM) (Davis, 1989) and flow theory (Csikszentmihalyi et al., 2014), reflecting the different information needs, expectations and experiential mechanisms of visitors in the individual phases of purchasing behavior. The paper responds to the identified research gap by analyzing the acceptance of metaverse technology in tourism from the perspective of the individual phases of tourist journey and evaluating the metaverse as a tool for presenting tourist attractions and destinations. Within the TAM framework, the study focused primarily on perceived usefulness and perceived ease of use of metaverse technologies, while flow theory was reflected through the concepts of immersion and experiential engagement during the virtual experience.

Literature Review and Theoretical Framework

The empirical part is based on a quantitatively oriented experimental design, supplemented by observation. The research sample consisted of 90 respondents who participated in an experiment comparing traditional printed information materials with an immersive presentation of the same tourist attraction in a metaverse environment. Respondents first worked with printed materials and then took a virtual tour using Meta Quest 3S and Meta Quest 3 VR headsets. The length of the virtual experience ranged from 10 to 20 minutes, depending on the individual interest of the participants. To minimize contextual differences, all respondents were exposed to the same attraction content in both formats. Participants' previous experiences with VR technology were also captured in the survey as another descriptor of participants.

Methodology and Methods

Data collection was conducted using structured questionnaire to collect data, which consisted mainly of closed questions rated on a five-point Likert scale, supplemented by selected open questions, focusing on perceived informativeness, trustworthiness, usefulness, degree of immersion, intuitiveness of control and willingness to recommend the presented attraction. The data was processed using IBM SPSS Statistics. The Wilcoxon signed-rank test, Fisher's exact test, Mann–Whitney U test, and Spearman's correlation coefficient were used to test the hypotheses, with a significance level set at $\alpha = 0.05$.

Findings and Contribution

The results of the research showed that the metaverse presentation was rated significantly more positively than printed materials in all phases of the visitor journey. The most significant difference was in the pre-travel phase, where respondents perceived the metaverse as more trustworthy, informative and useful in planning and selecting a destination for their future vacation. During the stay, the metaverse presentation was associated with a higher degree of immersion in the atmosphere of the place and a better understanding of its historical and contextual background. In the post-travel phase, there was a higher willingness to recommend the attraction presented through the metaverse. The results correspond with previous studies emphasizing the ability of VR technologies to support destination marketing and pre-travel decision-making.

Originality And Value

Further analyses confirmed a strong positive correlation between the degree of immersion and willingness to recommend, as well as the important role of perceived usefulness and ease of use of the technology, in line with the assumptions of the TAM model. These findings support the principles of Marketing 6.0, according to which advanced technologies create value especially when they enhance the authentic experience, emotional engagement and sense of control on the part of the customer.

Research Limitations

The study is limited by its experimental design and reliance on subjective self-reported perceptions rather than actual visitor behavior in real tourism settings. In addition, the findings are based on a specific metaverse application and may not be fully generalizable to all tourism contexts.

Theoretical and Practical Applications and Implications

The paper contributes to the expansion of theoretical knowledge about the acceptance of the metaverse in tourism by systematically placing it within the framework of visitor journey phases and current marketing concepts such as Marketing 6.0 (Kotler et al., 2024). From a practical point of view, it highlights the potential of the metaverse as a complementary tool for marketing communication, heritage interpretation and visitor experience management. The metaverse does not appear to be a substitute for physical travel, but rather a technology that connects the informational and experiential levels throughout the visitor journey process.

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NAVIGATING THE TRIPLE CHALLENGE: HOW BUSINESS ECOSYSTEM GOVERNANCE POSITIONS ENERGY FIRMS FOR DIGITAL, SUSTAINABLE AND REGULATORY SUCCESS

Mastropetrou, Margaret[1]; Papamichos, Orestis[2]; Kutsikos, Konstadinos[3]

[1]The Wave.Ahead Center for Growth Transformation, Business School, University of the Aegean, Chios, Greece

[2]Public Power Corporation Greece

[3]The Wave.Ahead Center for Growth Transformation, Business School, University of the Aegean, Chios, Greece

Keywords: Digital Transformation, Sustainability, Regulatory Compliance, Energy, Business Ecosystems, Innovation, Strategy

Abstract: The energy sector is undergoing a tremendous transition driven by digital transformation, sustainability and regulatory compliance. While each of these forces has received scholarly attention on its own, their interaction and effect on organizational strategy is underexplored. This study examines how energy firms might best position themselves to deal with these convergent pressures, guided by the hypothesis that an ecosystem-level governance provides a more resilient, innovation-oriented and effective response than firm-level measures. The main research question asks how these forces shape the internal dynamics and coordination challenges within energy business ecosystems. The paper is based on a systematic mapping study, which highlights a significant gap: previous studies have mostly viewed digital transformation, sustainability and regulatory compliance as independent forces rather than as concurrent ones. Building on this gap, a comparison of two significant European energy companies, is carried out, evaluating their different strategic approaches to handling these pressures. The findings verify that addressing the three factors as interdependent is better from a strategic and analytical standpoint. The analysis shows that an ecosystem governance approach facilitates coordination, accelerates innovation and enhances regulatory responsiveness. Future research could extend this analysis by investigating how transitional utilities can develop and coordinate competitive business ecosystems in order to derive practical strategies for attracting and retaining the right stakeholders.

Introduction

The global energy industry is undergoing a tremendous and inevitable transformation. Due to the convergence of digital technology, environmental requirements and changing regulatory frameworks, energy firms are becoming active players of complex, data- driven ecosystems, rather than just power producers and distributors. This change goes far beyond the adoption of new tools; it entails a fundamental restructuring of how value is created, exchanged and governed across the entire energy value chain (Mastropetrou et al., 2019; Kutsikos and Kontos, 2011). The systemic integration of technologies like blockchain, cloud computing, artificial intelligence (AI), and the Internet of Things (IoT), which together allow for real-time data collection, predictive analytics, and the automation of crucial energy processes, is at the core of this change (IEA, 2020). The rise of smart grids, virtual power plants (VPPs) and prosumer models shows a clear shift from the centralized, linear energy systems of the past to decentralized, interconnected and intelligent networks, where information is just as important as energy itself (Nazari and Musilek, 2023). At the same time, digital transformation and sustainability strategy are inextricably linked due to the demand to fulfill climate neutrality targets and adhere to institutional frameworks (Makridou et al., 2024). Despite considerable technological maturity, the disparity between digital intent and digital capabilities persist. The full potential of digital transformation is still limited by organizational fragmentation, a lack of interoperability standards, regulatory ambiguity, and human resistance. At the level of energy business ecosystems these tensions are particularly noticeable because governance structures struggle to keep up with the quickly changing institutional and technological realities (Chatzinikolaou et al., 2025). This paper examines the governance of energy business ecosystems at the intersection of digital transformation, sustainability and regulatory compliance. It claims that in order to advance a systemic and institutionally grounded knowledge of the energy transition, it is crucial to comprehend how ecosystem actors co-evolve and coordinate rather than concentrating on specific technologies or businesses in isolation. By doing this, it fills a gap in the literature for studies that integrate strategy, technology, and institutions into a logical analytical framework.

Aims and Objectives

The primary aim of this study is to show that energy companies that adopt a cooperative ecosystems strategy are better equipped to navigate the challenges of the energy transition than those who attempt to compete in isolation. As digital transformation, sustainability challenges

and regulatory requirements converge, no single firm has the complete collection of skills, data assets and institutional connections needed to successfully adapt. This paper makes the case that ecosystem involvement, which is defined by co-evolution, resource sharing, and cooperative governance, is a strategic requirement as opposed to an optional organizational paradigm. In order to accomplish this, the study pursues two interrelated goals. First, a Systematic Mapping Study (SMS) is first carried out, in order to compile the body of knowledge on digital transformation, sustainability, regulatory compliance, and energy business ecosystems. The SMS is employed to map the present level of knowledge, identify ongoing research gaps, and outline the main obstacles that energy companies encounter when trying to manage the transition on their own or in the absence of ecosystem governance frameworks. By systematically examining the range of available data, the SMS offers the empirical and theoretical framework upon which the study's arguments are developed. Second, to demonstrate the real-world effects of adopting an ecosystem strategy, the study compares two significant European energy firms, Public Power Corporation (PPC, Greece) and Enel (Italy). Enel, which has followed an explicitly ecosystem-oriented strategy through digital platforms, sustainability integration, and cross-sector partnerships, is contrasted with PPC, which operates mostly within a national setting with a more conventional organizational structure. By demonstrating how ecosystem orientation translates into quantifiable differences in flexibility, resilience, and strategic positioning during the energy transition, this comparison helps to root the theoretical argument in observable organizational reality.

Literature Review

Underpinning these objectives is a body of literature that links digital transformation, sustainability and ecosystem governance as interconnected processes restructuring the energy industry. According to Nazari and Musilek (2023), digital transformation in the energy sector is defined as the systemic integration of technologies, data, and processes that fundamentally alters value creation mechanisms, shifting energy systems from centralized, linear models to decentralized, interconnected, and smart networks. Real-time data collection and exploitation throughout the energy chain is made possible by the deployment of IoT, AI, cloud computing, and blockchain. The most notable examples of this change are smart grids and virtual power plants, which enable dynamic supply and demand management and turn passive consumers into active prosumers (Chatzinikolaou et al., 2025). Guo, Chen and Chen (2025), drawing on panel data from listed energy companies, demonstrate empirically that digital transformation significantly enhances sustainable development performance, though its benefits remain

unevenly distributed across firm size and value chain position — reinforcing the need for coordinated governance rather than firm-level technological adoption alone. With the energy trilemma of security, environmental performance, and equity taking on new dimensions through digital tools, sustainability serves as a strategic catalyst within this transition (Ojukwu et al., 2024; Hashim and Ojekemi 2026). At the institutional level, Environmental, Social and Governace (ESG) frameworks and regulatory compliance-based on tools like the Corporate Sustainability Reporting Directive (CSRD) and EU Taxonomy- have evolved from defensive mechanisms into strategic pillars that influence investor confidence, competitive differentiation, and access to green finance (Makridou et al., 2024). Kim and Yang (2025), through a systematic review, address the period of 2020 to 2024 as one of regulatory transition, in which ESG became from an optional corporate strategy, a fundamental governance expectation- a transformation that directly affects how energy firms manage compliance, reporting and stakeholder alignment. By facilitating structured sustainability reporting and boosting institutional legitimacy, digital ESG platforms further bridge compliance and transformation (Sharma et al., 2023). Energy business ecosystems constitute the organizational framework within which these perspectives converge, characterized as dynamic networks of interdependent actors- producers, consumers, regulators and technology providers- that co-evolve across macro, meso and micro levels and co-create value through the exchange of tangible and intangible resources (Kutsikos et al., 2014; Chatzinikolaou et al., 2025). Shahzad et al. (2025), in their digital mediation in energy communities study, find that energy ecosystems in their initial stage are defined by loosely attached stakeholder ecologies rather than fully mature governance frameworks, and that platform integration and coordinated governance are prerequisites for their maturation- an outcome that drives the current study's focus on meso-level coordination. According to the Co-Evolutionary Business Ecosystem Perspective (CEBEP), business model innovations result from actors working together with their institutional context and aligning around common resources to create sustainable value propositions (Zapata-Riveros et al., 2024). Although the concept of business ecosystem has seen great development in high-tech industries, where platform strategies have established new patterns of collaboration and competition (Giannaraki and Koutsikos, 2021), in the energy sector, relevant research remains limited and largely fragmented (Mastropetrou et al., 2025).

Methodology

Systematic mapping study is the best methodological approach for the current study, whose goal is to develop a comprehensive and evidence-based framework of how digital transformation, sustainability and regulatory compliance interact with energy business ecosystems, a field characterized by heterogeneity and where empirical data is varied and fragmented. In contrast to systematic literature review, which aims to answer a specific research question through synthesizing results, systematic mapping study focuses on categorizing and describing the available literature, identifying trends and research gaps (Vanhala et al., 2022). The application of this methodology is further justified by the specific elements of this field. Energy business ecosystems combine technological, environmental and regulatory dimensions withstanding deduction to a single disciplinary lens. Systematic mapping enables the analysis of this multi-layered reality through an objective, transparent and repeatable process, and with clear inclusion criteria of the selected studies, while producing a conceptual "map" of the research area that illustrates the concentration or lack of scientific data around critical fields, thus functioning as an orientation tool for future research (Oakley et al., 2015). Overall, systematic mapping combines rigor and flexibility, allowing for the construction of a coherent picture of the state of knowledge in a constantly evolving and complex field, like that of modern energy business ecosystems. The steps of the methodology include: planning, conducting the search and presenting the results.

Plan: Based on a first- level broad literature review and on parallel research efforts by the authors on business ecosystems, the main research question was formulated: How do digital transformation, sustainability, and regulatory frameworks shape the internal dynamics and coordination challenges within energy business ecosystems?

Conduct search: The initial search was conducted using search strings in scientific databases (Google Scholar and Science Direct) by reading through journal publications. The sets of keywords were subsequently developed based on the main concepts of digital transformation, sustainability, regulatory compliance and the energy sector. During the initial search, a key hypothesis was developed that directed the use of employed research methodology: The more digital, sustainability, and regulatory logics are integrated through an ecosystem-level governance model, the more resilient, innovation-oriented, and effective the energy business ecosystem becomes. The specific steps for searching are the following: As Kitchenham and Charters propose (2007), the hypothesis is divided into distinct aspects (i.e. population,

outcomes); a list of synonyms is created; search terms are identified; to get a comprehensive list of research objects, a backward and forward search is conducted; several inclusion and exclusion criteria were applied during the search. The key search strings that were used during the search are highlighted in table 1.

"digital transformation" or "sustainability" and "energy sector" "digital transformation" and "energy business ecosystems"	"sustainability" and "energy sector" "sustainability" and "energy business ecosystems"	"regulatory compliance" and "energy sector" "regulatory compliance" and "energy business ecosystems"

Table 1: List of search strings

The previous stage produced a large number of papers (132), which were then filtered according to titles, abstracts, and full text reading, as recommended by Petersen et al. (2015). Table 3 displays the pertinent inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Books or book chapters that provide information on digital transformation, sustainability or regulatory compliance in the energy sector.	Studies without empirical findings
Empirical studies with results based on observed and measured phenomena Derived knowledge from actual experience rather than from theory or beliefs.	Duplicates
Papers that provide scientific findings or reviews of research on the topic of digital transformation, sustainability, regulations or energy business ecosystems (opinion papers, validation papers, evaluation papers, case studies).	Studies not available in full text
Industry reports and thought leadership articles from top management consultancies (McKinsey, Bain, BCG).	Papers not written in English
Time frame: 2018- 2025: according to a number of research papers, the interest on the sustainability and digital transition started on 2018 (Rosario and Dias, 2022; Abelaira et al., 2025).	

Table 2: Inclusion- Exclusion Criteria

The result of the application of the inclusion/exclusion criteria was a pool of 78 papers. A classification step followed, based on a topic-related classification scheme, as proposed by Petersen et al. (2015). Initially, keywords and concepts suggesting a paper's contribution and context were found by analyzing and examining the abstracts of these papers. Keywords from several papers were then combined to provide a thorough grasp of the various topics covered. The authors chose to go deeper into the introduction and/or conclusion sections of the corresponding papers when abstracts were insufficient. 70 papers were chosen from the previously indicated pool of papers. The articles were arranged in this methodology phase using

the strategy created in the preceding step. The data extraction procedure was documented using a table that included all of the classification scheme's categories. A brief justification for each paper's placement in a particular category was provided. The data extracted from each study were as follows: title, author, publication date, main topic area, source (journal/conference, etc.). The retrieved data were then depicted using systematic maps to identify trends, concentrations and gaps in the literature.

Findings

Several insights on the study effort's premise were revealed by the examination of the selected body of scholarly and industry research material. The first mapping (temporal evolution) demonstrates a notable acceleration in publications after 2020, due to the COVID-19 pandemic's digital push (Mazza and Frantzi, 2021) and growing political pressure for climate action (Gazmarian et al., 2025). This attests to the topic's current relevance as well as its entry into a stage of scientific development (table 4).

Year of publication	Number of studies
2018- 2021	26
2022-2025	44

Table 3: Number of studies published throughout the years

The second mapping (thematic distribution) identifies five research clusters: (a) digital transformation, (b) sustainability, (c) regulatory compliance, (d) energy ecosystems and (e) their intersections. However it reveals a critical flaw: the three main dimensions are typically handled separately. Holistic frameworks integrating digital, sustainable and regulatory logics remain rare, indicating a topic fragmentation in the literature (table 5).

Research clusters	Number of studies
Digital transformation	38
Sustainability	15
Regulations	11
Energy ecosystems	6
All- encompassing	3

Table 4: Thematic distribution of selected studies

The third mapping (levels of analysis) reveals a concentration of research at the macro-level (policy, regulation) and micro-level (firms, technologies), while the meso-level- where inter-organizational coordination and ecosystem governance actually take place- is substantially under-researched (table 6).

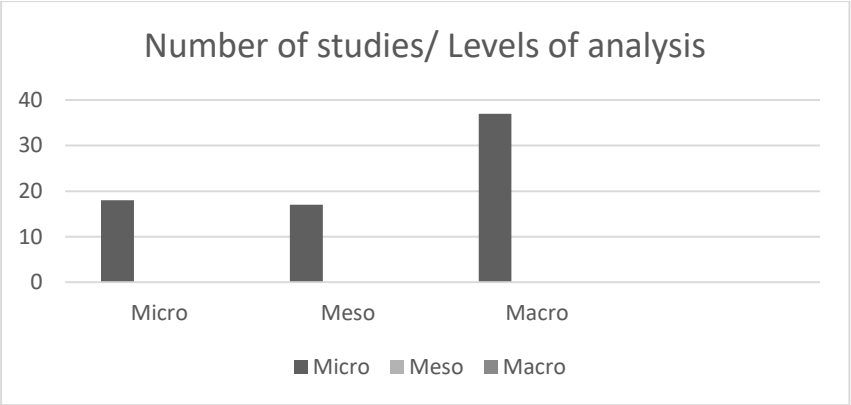


Table 5: Levels of analysis

Beyond the structural gaps, the mapping also examines a set of key challenges that energy firms face in their attempt to simultaneously incorporate the principles of digital transformation, sustainability and regulatory compliance. These challenges often interact: technological complexity and lack of skills limit the return on investment in smart infrastructure, while regulatory ambiguity hampers long-term strategic planning. The issue is therefore not just about technological solutions, but also about the institutional and organizational capacity to integrate the three dimensions of transformation (table 7).

Key challenges	Number of studies
Outdated/ incompatible systems	10
Lack of integrated systems	8
Cybersecurity/ data privacy	9
Lack of interoperability & standardization	5
Technological readiness	6
Environmental/ energy cost	12
Lack of digital culture	6
Misalignment of technological changes and regulatory adaptation	18
Complexity of operations	15
High investment- implementation cost/ risk	19

Table 6: Key challenges for the energy sector

When combined, the four mappings reveal a structural misalignment between the way academia has addressed these issues and how they actually appear in real-world situations. Research continues to approach digital transformation, sustainability requirements, and regulatory complexity as distinct domains and ignores the governance layer where their effects intersect, despite the fact that energy ecosystems are concurrently managing these challenges. Therefore it is both conceptually and empirically justified to close this twofold gap (thematic

fragmentation and level misalignment) by implementing an integrated governance framework that integrates digital, sustainability and regulatory logics simultaneously, specifically at the meso-level of energy business ecosystems.

Discussion

This section interprets the findings of the systematic mapping, by studying how digital transformation, sustainability and regulatory compliance converge in practice. Two European energy corporations- PPC and Enel- are used as illustrative cases to bridge the gap identified in the mapping with empirical understanding. Three factors led to the selection of PPC and Enel: (1) they both operate under the same EU regulatory frameworks (CSRD, SFDR, EU Taxonomy, European Green Deal) while navigating different national contexts, allowing for a comparison of how regulatory constraints translate into coordination mechanisms; (2) they represent different stages of transformation maturity—Enel as a proactive ecosystem orchestrator, PPC as a legacy utility in reactive transition; and (3) they both publish comprehensive sustainability reports, digital roadmaps, and ESG disclosures, allowing for systematic secondary-source analysis. PPC, the biggest energy provider in Greece and a former state monopoly is undertaking organizational and digital transformation under its “PPC Blue” strategic plan, with the goal of de-lignitization by 2026 (PPC Group, 2025). With its "Open Power" concept, Enel, which has operations in more than 30 countries, is regarded as a pioneer in smart technology, sustainable practices, and open ecosystem governance (Enel Group, 2024). While network modernization, ESG compliance, and adapting to quickly changing regulations are comparable concerns, their strategic approaches and ecosystem maturity are very different (Papamichos, 2025).

Parameter	PPC	Enel
Digital transformation	Smart grids, FTH FiberGrid, AI, data governance (PPC Group, 2025)	Smart grids, AI forecasting, digital platforms (Enel Group 2024)
Sustainability/ ESG	“PPC Blue”, delignitization target by 2026; ESG ratings (PPC Group, 2025)	Enel Green Power, Sustainable Development Goals (SDG) integration, circular economy, full ESG integration (S&P Global, 2025)
Regulatory compliance	Alignment with CSRD, EU Taxonomy; European Sustainability Reporting Standards (ESRS) data governance guidelines (PPC Group, 2025)	Advanced compliance framework; active role in European initiatives (OECD, 2023)

Ecosystem approach	Gradual expansion of partnerships with technology providers; more closed operating model	"Open Power" model with participation of regulators, start-ups and communities (Enel Group, 2024)
Key challenges	Digital divide, organizational inertia, transformation financing	International portfolio complexity, cybersecurity (S&P Global, 2025)
Overall path	Transitional stage of digital and ESG modernization (PPC Group, 2025)	Mature stage of digital and sustainable integration; good practice (Enel Group, 2024)

Table 7: Comparative analysis of PPC- Enel

Two essentially distinct models of ecosystem coordination are revealed by the comparison. PPC exemplifies a fragmented compliance-driven paradigm in which sustainability stays inward-looking (focused on own emissions rather than distributed networks), digital transformation acts reactively, and regulatory compliance serves as an external restriction rather than a coordination mechanism. The three logics persist in parallel without converging into a shared governance logic, which limits cooperative innovation and stakeholder alignment (PPC Group, 2025). Enel, on the other hand, is an example of a purpose-driven adaptive ecosystem. The "Open Power" model combines sustainability, digital transformation, and regulatory compliance into a cohesive strategy: sustainability serves as a partner-selection and alignment mechanism through SDG integration; digital platforms facilitate real-time data exchange and co-creation; and regulatory compliance is actively shaped through cooperation with EU institutions and the Organisation for Economic Co-operation and Development (OECD), acting as an institutional coordinator rather than a constraint (Enel Group, 2024; OECD, 2023; S&P Global, 2025). The case comparison confirms the critical gap identified in the mapping: most research handle digital transformation, sustainability, and regulatory compliance in isolation, failing to recognize that energy transformation occurs through networks of interdependent actors that co-evolve and co-create value. The identified challenges- lack of interoperability and technological readiness, regulatory ambiguity, organizational inertia- cannot be overcome by unilateral interventions; they require collective coordination and institutional alignment among energy firms, technology providers, regulators, prosumers and social actors (Mastropetrou et al, 2025). Each dimension plays a distinct, but interdependent role within the ecosystem: (1) Digital transformation reshapes structural and functional dynamics. While smart grids, AI and data-sharing platforms increase connectivity and enable adaptive coordination, they also create new frictions (interoperability gaps, governance deficits) that technology cannot fix on its own (Vrontis et al., 2022; Chatzinikolaou et al., 2025); (2) Sustainability serves as a regulatory compass acting as a guiding force and a source of institutional legitimacy; it

redefines value creation around long-term socio-environmental effect, draws in aligned players, and weeds out those who cannot adapt (Zapata-Riveros et al., 2024); (3) Regulatory frameworks provide the institutional scaffolding. ESG principles create common standards that promote cooperation, trust, and transparency, but they run the risk of becoming a source of institutional rigidity if compliance takes the place of shared purpose as the binding force (Makridou et al., 2024; Truong et al., 2025).

To fully answer the research question, it is crucial to emphasize that the three forces are co-shaping the internal dynamics of energy business ecosystems through a triadic articulation: digital transformation operationalizes sustainability by transforming abstract roles into measurable practices through data transparency and emissions monitoring (Ojukwu et al., 2024); sustainability gives digital transformation direction and legitimacy, transforming it from a technocratic intervention into an institutionally legitimated process (Sharma et al., 2023); regulatory frameworks mediate and stabilize their interaction by ensuring accountability and allowing heterogeneous actors to cooperate under common rules (Zatonatska et al., 2024). When these three forces work synergistically, they create resilient, innovative, and adaptive ecosystems. When they remain fragmented, they lead to institutional rigidity, technological underutilization, and failure to achieve sustainability goals- the dynamic that Mastropetrou et al (2025) identify as a barrier to ecosystem participation and maturation. The comparative analysis partially validates the hypothesis: the more an energy company integrates the logics of digital transformation, sustainability and regulatory compliance into a common ecosystem governance model, the more effectively it coordinates inter-organizational relationships and the more resilient and innovation-oriented the ecosystem becomes. This limited validation is itself theoretically noteworthy: it implies that integration is not linear but gradual, developing concurrently across organizational, institutional and technological aspects. This is demonstrated by Enel's sophisticated integration, which creates a self-reinforcing cycle that promotes innovation, resilience, and social legitimacy: digital platforms act as coordination infrastructure, sustainability offers regulatory orientation, and compliance guarantees institutional stability (Enel Group, 2024). The consequences of partial integration are evident in PPC's transitional trajectory, where the three logics function in parallel rather than synergistically: underutilized digital investments, limited collaborative innovation, and challenges in attracting and aligning external partners around a common sustainability vision (PPC Group, 2025). The theoretical implication is obvious: governance architecture- the extent to which digital, sustainability and regulatory reasoning are structurally aligned within the

ecosystem- determines the coordination capability, resilience and long-term competitiveness. The practical implication is similarly evident: transitional utilities cannot bridge this gap through partial compliance or standalone digital initiatives; what is necessary is a conscious structural design towards open, integrated ecosystem governance.

Conclusions and Future Work

This analysis confirms that energy business ecosystems are the essential organizational structure needed for a successful and sustainable energy transition, rather than just an alternate analytical framework. The level of integration of the three dimensions directly influences the internal coherence, adaptability and collaborative dynamics of energy ecosystems- making the ecosystem approach both a conceptual requirement and a strategic imperative (Papamichos, 2025). Ultimately, it is through this convergence of digital competence, sustainable orientation and institutional alignment that energy ecosystems can grow from fragmented groups of actors into cohesive, resilient and innovation-driven systems that can handle the complexity of the energy transition. Following these findings, our future work will shift focus towards the practical challenge of competitive positioning and ecosystem building. It will specifically look at how transitional utilities like PPC may build the collaborative capacity required to compete with established orchestrators like Enel by deliberately developing and orchestrating their own business ecosystems. Central to this effort will be the question how can companies at an earlier level of ecosystem maturity can attract, interact with and retain the right players within their ecosystems. This work expands on our earlier research on the motivations that drive organizations to join business ecosystems (Mastropetrou et al., 2021), translating these theoretical underpinnings into practical governance solutions for ecosystem builders in the energy industry.

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MANAGEMENT MODEL FOR A UNIVERSITY SOCIAL RESPONSIBILITY PROGRAMME FOR A BUSINESS SCHOOL IN LATIN AMERICA

Ramírez-Lozano, Julianna Paola[1]

[1] Pontificia Universidad Católica del Perú, Lima, Perú.

CENTRUM Católica Graduate Business School, Lima, Perú

Keywords: Business School, Social Responsibility, Sustainability, SDGs, SME

Abstract

This study aims to describe a practical and successful application of a university social responsibility and sustainability programme management model, run by a business school in partnership with public-private financial institutions, that positively impacts women microentrepreneurial leaders in small and medium-sized enterprises. This research describes, analyses, and demonstrates the positive impact of the "Mujer, tu negocio crezca más" programme, highlighting the value of social intervention programmes and applied research in response to the implementation of a business school's social responsibility and sustainability model in a public-private partnership. The research was conducted through qualitative research, involving in-depth interviews with company executives and focus groups with women microentrepreneurs participating in the programme.

Introduction

This study analysed the design and implementation of a university social responsibility programme based on applied research and social intervention. The objective was to provide business training by volunteer professors from the Business School.

Female entrepreneurship plays an important role in economic and social development by fostering innovation, creating jobs, and reducing gender inequality (Campos et al., 2020). Despite these contributions, challenges such as limited access to financial resources and support networks persist, hindering women from competing on equal terms with men (Showkat et al., 2025).

The practical analysis of this experience made it possible to understand the concept of shared value and the positive impact it generates for all stakeholders involved in the programme. The programme was also related to the Sustainable Development Goals (SDGs).

Theoretical Framework

Microenterprises in Peru

The microenterprise sector is key to economic, social and regional development in developing countries, particularly in rural areas (Zamora-Pucha, 2020). Microenterprises are the source of a significant number of jobs and contribute to regional economic growth (Rodríguez Arrieta et al., 2019).

In Peru, microenterprises are defined as businesses with fewer than 10 employees and annual sales not exceeding 150 Applicable Tax Units (S/742,500 soles) (Ministerio de Trabajo y Promoción del Empleo, 2023). According to the Ministry of Production (Ministerio de la Producción, 2022), more than 2.1 million formal MSMEs were operating in 2021, of which 95.6% were microenterprises.

Microenterprises typically operate with simplified systems of production, administration, marketing, and/or finance, often managed by an individual with previous experience in the relevant field of work (Amorós et al., 2022). Recent research points to lower levels of productivity and low investment in technology and worker development, resulting in poor working conditions for employees (Lust, 2021). This has limited the improvement of working conditions and has perpetuated a situation in which precarious working conditions are seen as a source of profit (Lust, 2021).

Recent data show that 97% of microenterprises have not grown in the last 10 years. This provides evidence of the structural challenges they face on their path to growth and expansion (PQS, 2023).

Women microentrepreneurs: challenges and difficulties

Women's leadership in the approximately 1.4 million enterprises in this sector should be highlighted (Rincón, 2021). In particular, women show a remarkable entrepreneurship rate of 22.5%, surpassing the rate for men, which is 21.5% (Rincón, 2021). Approximately 33.8% of formal microenterprises are owned by women, corresponding to about 555 thousand microenterprises. Thus, entrepreneurship has a significant impact on personal recognition, autonomy in decision-making, and participation in business management and household decisions (Campos et al., 2020). Showkat et al. (2025) found a strong association between financial inclusion and women's economic empowerment.

Despite these advantages, women entrepreneurs face a number of difficulties due to their gender (Ruiz et al., 2023). These difficulties include the need to reconcile family and professional responsibilities, which hinders the development of their activities and the

performance of their businesses (Jaén et al., 2023). This puts women at a disadvantage and leads to higher levels of indebtedness (Velásquez and Portocarrero, 2019). Specifically, those competencies may play a crucial role in fostering an entrepreneurial culture, helping to enhance awareness of business opportunities, especially when women are driven by the desire to improve their autonomy and income (Llados-Masllorens and Ruiz-Dotras, 2022).

In terms of access to financial instruments, the lack of property in women's names or credit history can make it difficult to obtain credit from financial institutions or suppliers to start a business (Orihuela-Ríos, 2022).

Overall, women are less likely than men to start their own businesses, and this disparity tends to increase as a country's economic development progresses, which underscores the importance of examining women's entrepreneurship in conjunction with the level of economic development (Mouazen and Hernández-Lara, 2023).

Business education for women microentrepreneurs

Previous research has confirmed the critical importance of educational support and specific business education for the viability and sustainability of women-owned businesses (Nani and Mathwasa, 2023). Business education is essential for women microentrepreneurs, as several studies have shown that education levels have a positive impact on the performance of women-owned businesses (Serio, 2022).

The literature also shows a positive and significant impact of education on the overall performance of women-owned businesses, with a direct correlation to higher productivity and more efficient management (Serio, 2022). Limited availability of finance is one of the main barriers to business success for women entrepreneurs (Gutiérrez Cruz et al., 2021). These initiatives not only promote the success of women-owned enterprises but also play a critical role in closing persistent gender gaps in the entrepreneurial ecosystem (Carvallo Monsalve et al., 2023). In conclusion, business education emerges as a fundamental pillar in promoting women's entrepreneurship in Peru.

Municipal savings and credit banks

Their primary objective is to serve populations that are not reached by the formal banking system (Peruvian Federation of Municipal Savings and Credit Banks [FEPCMAC], 2022). They are owned by municipalities or local authorities, and their primary function is to encourage savings and offer financial services at the local level (Mayer et al., 2021). In the Peruvian financial system, municipal savings and credit banks have assumed responsibility for

servicing a significant portion of loans to micro and small enterprises, underscoring their importance in supporting this sector of the economy (Valverde and Ortiz, 2022).

Currently, 12 of these entities operate in Peru and 11 of them are grouped under the Peruvian Federation of Municipal Savings and Credit Banks (FEPCMAC) (Table 1). These entities were found to have managed a significant portion of the loans to this business segment in the Peruvian financial system (Gómez et al., 2018).

In light of this information, this study emphasises the importance of municipal savings and credit banks beyond their role as financial intermediaries.

Municipal Savings and Credit Bank (CMAC)	Established in	Member of the FEPCMAC
CMAC Arequipa	1985	Yes
CMAC Cusco	1980	Yes
CMAC Del Santa	1986	Yes
CMAC Huancayo	1988	Yes
CMAC Ica	1989	Yes
CMAC Maynas	1987	Yes
CMAC Paita	1989	Yes
CMAC Piura	1982	Yes
CMAC Sullana	1986	Yes
CMAC Tacna	1992	Yes
CMAC Trujillo	1982	Yes
CMCP Lima	1947	No

Table 1: Municipal Savings and Credit Banks

Source: Author's own creation based on the information from the Superintendency of Banking and Insurance (https://www.sbs.gob.pe/supervisados-y-registros/empresas-supervisadas/directorio-del-sistema-financiero/cajas-municipales)

University social responsibility

University Social Responsibility (USR) is an approach in which higher education institutions recognise their obligation to society and strive to contribute to the well-being of the community

in which they operate (Vallaeys, 2021). A fundamental part of the USR is the integration of social responsibility values and principles into the university's mission and vision (Ramirez Lozano et al., 2023). It becomes a central component of the institution's identity and purpose (Larrán Jorge, 2016).

The USR is an approach to university management that is gaining relevance worldwide, including in Latin America, as a response to the organisational and academic impact of universities (Vallaeys, 2014). Studies have shown that USR can influence the positioning of universities and their interaction with the community (Cruz-Arango et al., 2022).

Taking into account these characteristics of university social responsibility, a model was proposed (Figure 1) in which it was possible to train women microentrepreneurs in collaboration with the Municipal Savings and Credit Banks.

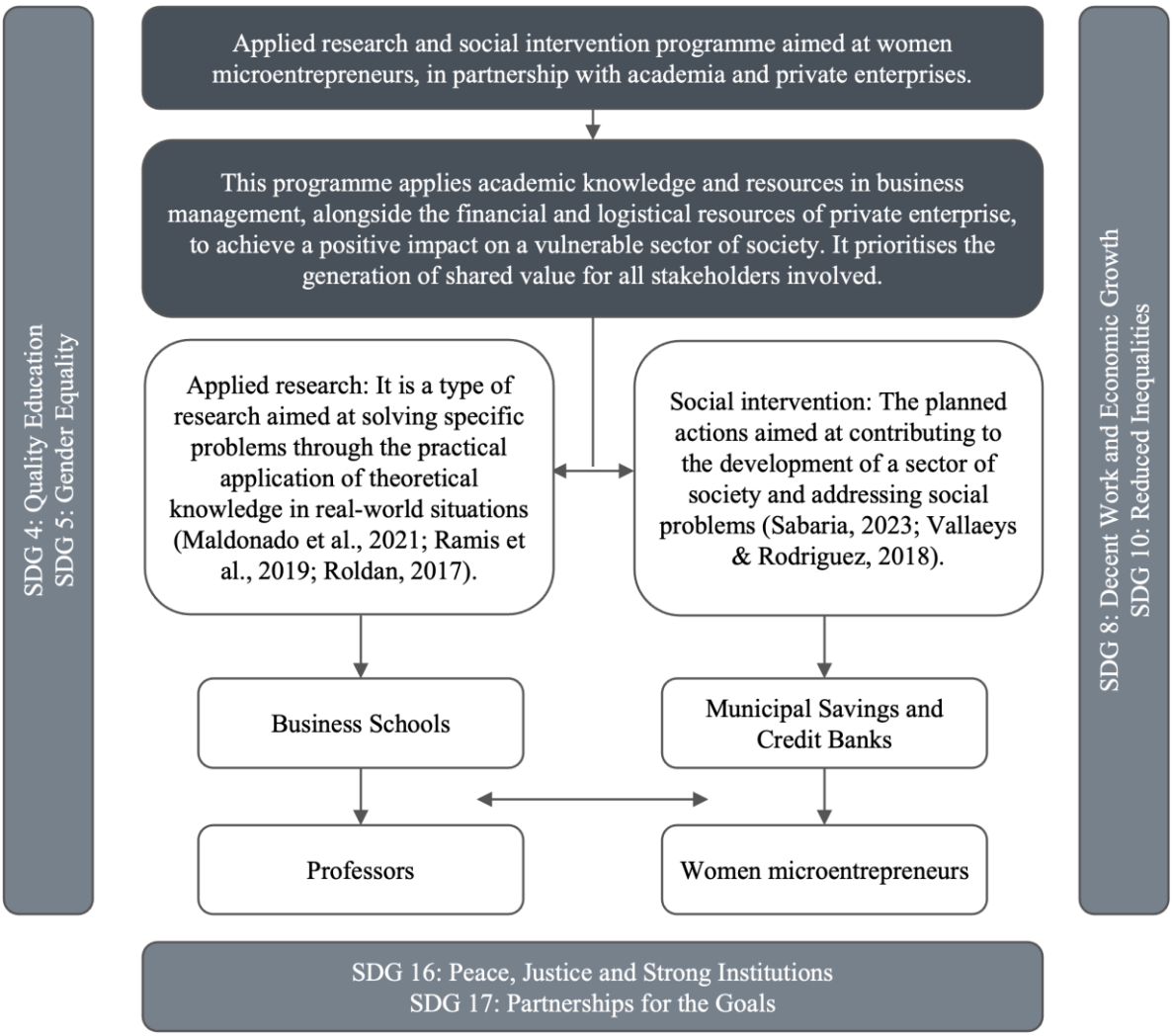


Figure 1: Theoretical Model of the Leadership and Business Training Programme for Women Microentrepreneurs

Source: Author's own creation

Methodology

Study approach

This qualitative study used in-depth interviews and focus groups as the main methods for data collection and analysis (Bansal and Corley, 2011).

The methodology proposed by Krueger (1991) and Hays and Singh (2011) was used to collect the data. The focus groups were conducted in person and led by the researcher. The data collected were analysed using thematic content analysis (Hays and Singh, 2011), which allowed for the identification of patterns and categories in participants' responses and a detailed understanding of their experiences and perspectives.

Programme description

The "Mujer, que tu negocio crezca más" (Woman, make your business grow) programme was developed as an applied research and social intervention initiative by a Peruvian Business School and Peruvian Municipal Savings and Credit Banks, institutions well-versed in the microenterprise ecosystem within the country.

The main objective was to provide a two-pillar programme: leadership training and business empowerment and improvement.

The objectives of the programme were as follows:

- Contribute to the co-creation of projects to improve the business of micro and small entrepreneurs.
- Provide two winners with a seed fund of S/4000 and S/2000.
- Contribute to the positioning of the participating companies as companies committed to the empowerment and growth of Peruvian women entrepreneurs.
- Conduct applied academic research on the business ecosystem of micro and small entrepreneurs.

During the first year (2023) of this programme, three editions were held in the cities of Cusco, Ica and Arequipa, each with the strategic support of the Municipal Savings and Credit Banks of Cusco, Ica and Arequipa, respectively. The programme was supported by 12 volunteer professors from the business school who also conducted applied research on lived reality.

In the third phase of the programme, participants had the opportunity to apply for a Seed Fund of $1200 for the first-place winner and $700 for the second-place winner based on their business improvement proposals. In the fourth phase of the programme, volunteer professors from the Business School conducted applied research focused on studying and analysing the ecosystem of microentrepreneurs in Peru.

Results

Profile of the participating microentrepreneurs

The average age of the participants was 36 years, with participants from Ica being the youngest with an average of 31 years, in contrast to those from Cusco and Arequipa who had an average age of 38 years. In addition, 7.36% had incomplete university education and 11.04% had incomplete technical education. Only 14.11% had completed secondary education.

> "To me, a woman should never neglect her responsibilities, she should find time for everything: for work, for the children, and for the family" (Participant from Ica)

Regarding the participants' businesses, the majority indicated that they had been operating between 1 and 5 years (60.11%), 25.14% had been operating for more than 6 years, and 14.75% had been operating for less than one year.

Gender gaps

One of the recurring themes in the focus groups was the balance between time devoted to family and time devoted to professional or entrepreneurial activities.

> "I worked in a company and had just had my baby. When she was three months old, I was supposed to leave her with someone and go back to work all day, but I decided not to. I had been through this situation with my son. So, I decided not to do the same thing this time. I started my own business, but with my daughter by my side." (Participant from Cusco)
>
> "I'm brave, as you say. I survived a year of the pandemic with a newborn. I'm a professional administrator, but I stopped working for my baby. However, my savings were running out, so I decided to risk the little money I had by starting a business and gradually making it grow. To be honest, I feel quite satisfied with everything I have achieved so far, and I will continue to move forward for my children" (Participant from Ica).
>
> " Being self-employed allows us to spend more time with our children, which we cannot do as employees, and as women we value that. We value time with our children" (Participant from Cusco)

In this sense, entrepreneurship is seen as an opportunity to continue to generate income for the household, while at the same time allowing them to manage their schedules to care for their children and spend more time with them in the early stages of life.

> "I believe in resilience. I also want to move forward and grow to give the best to my family, especially my daughters" (Participant from Ica)

> “I want to leave my children a legacy. Something they will enjoy and that will support them in the future." (Participant from Ica)

Therefore, motherhood remains a recurring theme among women microentrepreneurs.

Impact of the programme on microentrepreneurs

Among them, the workshop entitled "How to manage my business" received the highest satisfaction percentage (56.25%) of participants who indicated that their opinion of the workshop was "very good".

Satisfaction	Very good	Good	Fair	Poor	Did not attend	Total
Leadership and business empowerment	48.44%	39.06%	4.69%	0.00%	7.81%	100%
Workshop on Applied Research Methodology I	47.62%	36.51%	9.52%	1.59%	4.76%	100%
Management of your company's finances	45.31%	37.50%	7.81%	1.56%	7.81%	100%
Digital marketing and sales	57.81%	34.38%	6.25%	0.00%	1.56%	100%
Workshop on Applied Research Methodology II	54.10%	36.07%	6.56%	1.64%	1.64%	100%
How to manage my business	56.25%	34.38%	7.81%	0.00%	1.56%	100%
Workshop on Applied Research Methodology III	52.46%	36.07%	6.56%	1.64%	3.28%	100%
Sustainable Businesses	53.13%	34.38%	7.81%	0.00%	4.69%	100%
Average	51.89%	36.04%	7.13%	0.80%	4.14%	100%

Table 2: Satisfaction with the Programme Workshops

Source: Author's own elaboration

The average percentage of participants who reported a high or very high increase in the knowledge acquired in each programme workshop was 77.32%.

> "I feel very satisfied with everything I have learned and also for having established commercial ties with all the women entrepreneurs from Cusco. Thank you very much" (Participant from Cusco).

The results showed that 40.74% perceived a high level of income, 42.59% a medium level of income, 5.56% a very high level of income, and 11.11% perceived no change in their income. In addition, sustainable business training was included as part of the workshops.

> "My favourite course was the last one. Through this course, I learned that my customer really needs to take care of the environment. I don't use Styrofoam anymore and I try not to deliver my products in plastic bags" (Participant from Cusco).

Besides the workshops, two participants per region were selected to receive a seed fund based on their participation in the programme and their business improvement proposal. In general, the programme was well received by the participants, who rated it positively.

Impact on research professors

The professors who volunteered to assist in the workshops also found in this programme an opportunity to conduct applied academic research on the business ecosystem of women who own micro or small enterprises. As a result, five applied research projects were presented with information gathered from the participants and/or during the workshops.

- Studies on leadership and empowerment of women microentrepreneurs in emerging markets. The Peruvian case
- Reasons for the creation of women's microenterprises, capital structure, and the evolution of Peruvian women's entrepreneurship.
- Speeches about women microentrepreneurs and conversations among them about behaviours and attitudes for starting a business in Peru.
- Women microentrepreneurs in emerging economies: Impact of a training programme on their business environment, their customers, and the SDGs.
- The role of sustainable leadership training for women entrepreneurs.

The results of this research will contribute to the knowledge of the entrepreneurial ecosystem in the Peruvian market.

Impact on business school

The Business School strengthened its leadership as a business school committed to small businesses and entrepreneurs. Its contribution helped to generate indicators related to the Positive Impact Model that are supported by the four international accreditors: BGA, EQUIS, AACSB and BGA. As a result, it has become a national leader in sustainability and social responsibility. At the regional level, it is also recognised for its positive impact and contribution to the achievement of the SDGs and the 2030 Agenda.

The research conducted by CENTRUM PUCP's volunteer professors has helped position the institution as a leader in applied research on the microenterprise ecosystem and female entrepreneurship. In addition, the partnership between CENTRUM PUCP and the Municipal Savings and Credit Banks of Cusco, Ica and Arequipa was strengthened, laying the groundwork for future joint projects. Both institutions have experienced an improvement in their institutional image due to the positive reception of the programme and the campaign conducted

through the social media channels of CENTRUM PUCP and the three financial institutions, which together have more than 650,000 followers.

Impact on municipal savings and credit banks

The Municipal Savings and Credit Banks achieved improved positioning as companies committed to the training and continued growth of their female microentrepreneur clients. In addition, establishing alliances with one of the top business schools in Latin America provides an opportunity to stand out as socially responsible companies that contribute to development and support academia in generating new knowledge.

The programme had a positive impact on Sustainable Development Goals 4, 5, 8, 10 and 17 by providing women microentrepreneurs with access to business training from experts at a leading national business school.

Stakeholder	Impacts
Microentrepreneurs	• Women's empowerment, personal and business growth. • Access to a seed fund that will allow them to grow their businesses. • Building a stronger relationship of trust with the Municipal Savings and Credit Banks. • Receive training from volunteer professors from the best business school in Peru. • Participate in face-to-face workshops to develop key issues for their business development and personal growth.
Municipal Savings and Credit Banks	• Positioning as a company committed to the training and personal growth of women microentrepreneurs. • Positioning and improving the image of the company by valuing the development of its microentrepreneur clients. • Customer loyalty to the savings banks. • Attraction of new clients interested in the training offered by the PUCP Center and the possibility of winning the seed capital to improve their businesses. • Recognition as a socially responsible company. • Establish alliances with one of the business schools in Latin America.
Centrum PUCP	• Contribute to the fulfilment of its purpose as a business school that promotes good business. • Establish alliances with the most important Municipal Savings and Credit Banks in Peru. • Developing applied research based on the management of the mentoring and business training project for women micro-entrepreneurs from different regions of the country. • Being a reference in applied academic research in the study of the microenterprise ecosystem with the support of the Municipal Savings and Credit Banks.
Research professors	• Development of applied research relevant to the generation of knowledge about the microenterprise ecosystem and gender gaps in this sector.

Table 3: Impacts on Alliance Partners and Their Stakeholders

Source: Author's own creation

Discussion and Conclusions

The research shows that university social responsibility programmes developed from a social intervention and applied research approach are of great value in fulfilling the purpose of a business school, which is to contribute to quality education (SDG 4) for vulnerable populations, such as, in this case, Peruvian women microentrepreneurs.

The experience of this programme under the shared value creation approach (Porter and Kramer, 2011) in the framework of university social responsibility shows that business schools and universities in general in Latin America have an important role to play in society by generating shared value for all their stakeholders.

The study also identified areas for improvement, such as the management of schedules by volunteer teachers and the flexibility that should be granted to participants, since in addition to running their businesses, most of them are mothers and perform domestic tasks at home.

In terms of theoretical implications, this opens up further lines of research that will seek to study and understand the relationships between university social responsibility management and its links to the Millennium Development Goals, the Principles for Responsible Education, and social responsibility indicators.

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GOVERNMENTAL ASSISTANCE PROGRAMS FOR INDUSTRY-UNIVERSITY COLLABORATION: A COMPARATIVE PERSPECTIVE

Alkwifi, Osama; Al-Maadeed Abdulla, Sara
Department of Management and Marketing, College of Business
Qatar University, Qatar

Keywords: Industry-University Collaboration, Governmental Assistance, Triple Helix framework, Qatar, Innovation,

Introduction

University–industry cooperation is an important driver of innovation, research commercialization, and knowledge-based economic development. Governments play a central role in enabling this cooperation by providing funding, policy incentives, regulatory support, and institutional platforms that connect universities with industry. This study examines how governmental support influences university–industry cooperation and how policy design affects innovation outcomes. It focuses on support instruments such as research grants, co-financing schemes, innovation programs, technology transfer initiatives, and regulatory arrangements. The study is particularly relevant to Qatar, where strengthening the innovation ecosystem and linking academic research with industrial development are important national priorities.

Purpose, Aim and Objectives

The purpose of this study is to analyze how governmental support mechanisms encourage university–industry cooperation and contribute to innovation outcomes. The main aim is to develop a comparative understanding of policy instruments used in Qatar and to identify lessons that can help strengthen Qatar's innovation ecosystem.

Literature Review and Theoretical Framework

The literature on innovation systems emphasizes that innovation depends on interaction among universities, industries, governments, and other institutional actors. Universities contribute knowledge, research expertise, and skilled graduates, while firms contribute market knowledge, practical needs, and commercialization capacity. Government provides the policy environment that enables these actors to work together. University–industry cooperation can take several forms, including joint research, contract

research, consultancy, technology transfer, internships, commercialization, patents, spin-offs, and shared research centers. However, collaboration is often limited by differences in goals, timeframes, incentives, and expectations between universities and firms. This study will use the Triple Helix framework, which explains innovation through the interaction of university, industry, and government. The framework is suitable because it highlights the role of government in shaping collaboration through funding, regulation, incentives, and strategic policy design.

Methodology and Methods

The study will adopt direct interviews supported by secondary data. This approach is appropriate because the study focuses on analyzing policy instruments, institutional arrangements, and innovation-related outcomes across countries.

Findings and Contribution

The study is expected to identify important differences in how governments support university–industry cooperation. Some countries may rely on direct funding, while others may emphasize matching grants, innovation agencies, or public–private research centers. The findings are expected to show how policy design affects the depth and quality of collaboration. For example, programs that require joint university–industry applications or co-financing may encourage stronger industry commitment than programs with limited collaboration requirements.

Originality and Value

The originality of this study lies in its focus on the design of governmental support instruments rather than only the general importance of university–industry cooperation. It examines how policy structure, funding intensity, implementation, and collaboration requirements affect innovation outcomes. The study is valuable because it provides a comparative and evidence-based understanding of how governments can strengthen university–industry cooperation. For Qatar, it can help identify policy gaps and recommend improvements that better connect academic research with industrial and national development needs.

Theoretical and Practical Applications and Implications

Theoretically, the study contributes to the Triple Helix and innovation systems literature by showing how government policy design shapes the relationship between universities and industry. It highlights government's role not only as a funder, but also as a coordinator, regulator, and strategic enabler of innovation. Practically, the study can support policymakers in designing more effective collaboration

programs. Recommendations may include stronger co-financing mechanisms, clearer collaboration requirements, better intellectual property arrangements, and improved evaluation of policy outcomes.

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EXPLORING THE TWIN TRANSITION: EVIDENCE FROM ITALIAN MSMEs

Bocchini, Martina[1]; Capasso, Arturo[2]; Rossi, Matteo[3]

[1]Department of Law, Economics, Management and Quantitative Methods, University of Sannio, Benevento, Italy

[2]Department of Law, Economics, Management and Quantitative Methods, University of Sannio, Benevento, Italy

[3]Department of Law, Economics, Management and Quantitative Methods, University of Sannio, Benevento, Italy

Keywords: Twin Transition, Digitalization, Sustainability, ESG Performance, MSMEs.

Introduction

The twin transition, understood as the integrated pursuit of digital and sustainable transformation, has emerged as a central topic in European academic, policy, and managerial debates (Trevisan et al., 2024). Although research shows the potential of digital technologies to enhance environmental and energy efficiency and governance transparency (Tabares et al., 2025), empirical evidence remains limited. The literature has emphasized macro-level or policy-driven analyses (Trevisan et al., 2024), while firm-level dynamics remain underexplored (Renn et al., 2021).

Purpose, Aim and Objectives

The purpose of this study is to examine how digitalization influences sustainability performance within Italian micro, small, and medium-sized enterprises (MSMEs). Specifically, the study aims to explore the relationship between digitalization and ESG performance (including its pillars). The objectives of the study are to assess whether digitalization and sustainability are correlated, examine how financial fragility shapes their relationship, and evaluate whether this relationship differs between agri-food and non-agri-food firms.

Literature Review and Theoretical Framework

The Resource-Based View (Barney, 1991) and the dynamic capabilities framework provide an interpretative lens for understanding the digitalization-sustainability relationship, as financial and managerial constraints may limit MSMEs' ability to develop and reconfigure the resources required for both transformations. Consistently, Renn et al. (2021) suggest that digital investments not aligned with sustainability objectives may compete with sustainability goals, while Lan and Zhou (2024) show that this relationship weakens under resource constraints. These challenges may be relevant in the agri-food sector, characterized by lower technological maturity (Annosi et al., 2023).

Methodology and Methods

The empirical analysis was conducted on a sample of 786 active Italian MSMEs (63 agri-food and 723 non-agri-food) and 110 MSMEs which declared bankruptcy after 2021. The relationship between digitalization and sustainability was examined over the period 2021-2023, and for each year four OLS regression models were estimated using the overall ESG score and its pillars.

Findings and Contribution

The results indicate that the impact of digitalization on sustainability is weak and context dependent. Among active MSMEs, no stable relationship emerges over 2021-2023, and the sectoral comparison reveals no systematic differences between agri-food and other firms. Digital investments do not automatically translate into improved ESG performance and may even be associated with lower sustainability outcomes in firms in financial distress, highlighting the role of resource constraints and managerial capabilities.

Originality and Value

This study provides firm-level quantitative evidence on the twin transition in Italian MSMEs, extending a literature largely focused on macro-level analyses. By comparing financially active and distressed firms, it shows how resource constraints shape the digitalization-sustainability relationship. In addition, the comparison between agri-food and other MSMEs explores the role of sector-specific characteristics.

Research Limitations

The study is limited using a proxy for digitalization, which may not fully capture the complexity of digital transformation, and by sample heterogeneity, which may have weakened the statistical robustness of the results.

Theoretical and Practical Implications

Digitalization should be interpreted as an enabling condition for ESG performance, rather than an automatic driver. Digital investments may generate sustainability benefits only when embedded within a sustainability strategy. Policies promoting twin transitions should consider MSMEs' actual capabilities, complementing technological incentives with support for managerial capabilities and skills.

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PARTICIPATORY FORESIGHT FOR SOCIETAL ENGAGEMENT IN THE STRATEGIC MANAGEMENT PROCESS

Vaiginiene, Erika[1]; Paliokaite, Agne[2]; Gaizauskiene, Dovile[3]; Elenske, Aurinta[4]

[1]Faculty of Economics and Business Administration, Vilnius University, VU, Vilnius, Lithuania

[2] Visionary Analytics, Vilnius, Lithuania

[3] Kaunas University of Technology, Kaunas, Lithuania

[4] Visionary Analytics, Vilnius, Lithuania

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Keywords: Participatory Strategic Foresight, impact assessment; governance; immediate impact; intermediate impact

Strategic management has traditionally privileged managerial and expert-led processes of analysis, choice and implementation. Increasingly complex and uncertain environments require strategic processes that incorporate distributed knowledge, alternative perspectives, and longer-term societal concerns. Participatory foresight offers such an approach by combining futures-oriented inquiry with structured stakeholder engagement. Rather than treating participation as consultation around an already defined strategy, participatory foresight involves stakeholders in exploring uncertainty, constructing alternative futures and shaping shared strategic directions. This study examines whether such engagement generates effects beyond the strategic document and contributes to the strategic management process.

Purpose. The paper assesses the perceived impacts of societal engagement in participatory foresight and its contribution to co-created strategic management. It connects foresight impact research with strategy-as-practice, which conceptualises strategy as something actors do through situated practices and interactions (Jarzabkowski, 2005; Whittington, 2006). Building on foresight evaluation literature (Amanatidou, 2014, 2017; Harper, 2013), the study distinguishes immediate and intermediate effects across four domains: future awareness raising, learning, facilitating and embedding. The central argument is that participatory foresight can transform strategic management from expert-led planning into a process in which diverse actors jointly interpret uncertainty, develop shared future orientations and acquire ownership of implementation.

Methodology. The empirical setting is Lithuania 2050, a national participatory foresight and visioning process implemented between 2021 and 2023, involving more than 2,500 citizens, experts, policymakers, business representatives, academics, and civil society actors. An online survey was conducted in September–October 2024 among registered co-creators. Fifty-nine valid responses were retained. Immediate and intermediate impacts were measured using a six-point Likert scale and a previously validated multidimensional framework (Paliokaitė et al., 2025). Exploratory factor analysis used principal component extraction with Varimax rotation and Kaiser normalisation, applying a .70 factor-loading threshold. Reliability was assessed using Cronbach's alpha. Descriptive statistics, one-way ANOVA and, where appropriate, Mann–Whitney U and

Kruskal–Wallis H tests examined differences across demographic, professional and engagement characteristics.

Findings. Participants evaluated the effects of engagement positively across all measured dimensions. The strongest immediate outcomes were individual capacity to shape the future (M = 5.22, SD = 0.87) and time-distance awareness (M = 5.13, SD = 0.70). Among intermediate outcomes, shared implementation commitment was particularly strong (M = 4.94, SD = 0.94), followed by future engagement intent (M = 4.79, SD = 0.89) and enhanced long-term strategic orientation (M = 4.69, SD = 1.03). Participants' professional roles, represented institutions, sex and most demographic characteristics did not significantly differentiate perceived impacts, suggesting broadly shared and role-neutral effects. First-time involvement was associated with stronger individual empowerment ($p = .003$, $\eta^2 = .19$), while repeated participation showed near-significant associations with perceived knowledge creation ($p = .066$) and enhanced participatory inclusiveness ($p = .053$). Descriptive patterns further suggested that deeper and more interactive participation was associated with stronger trust, commitment and long-term orientation.

Originality. The study contributes to strategic management by showing that the value of participatory foresight lies not only in producing scenarios, visions or roadmaps, but also in changing the social conditions under which strategy is formed and implemented. The findings indicate that well-designed foresight can democratise strategic engagement while strengthening collective agency, strategic ownership and implementation responsibility.

Research Limitations. The study relies on self-reported perceptions, a relatively small sample, and a single national case; therefore, causal inference and broad generalisation are limited.

Theoretical and Practical Implications. Theoretically, the findings connect foresight impacts with participatory strategising by demonstrating how cognitive, behavioural, relational and institutional effects become part of the strategy process. In practice, they indicate that professional facilitation, iterative participation, attention to power asymmetries, and transparent feedback mechanisms are critical for converting societal engagement into strategic ownership and implementation commitment.

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GENERATIVE AI IN GLOBAL MARKETING FOR SUSTAINABILITY: A SYSTEMATIC REVIEW OF CREATIVITY, CULTURAL ADAPTATION, AND GOVERNANCE

Nassar, Mohamed[1]; ElAlfy, Amr[1]; Al-kwifi, Osama Sam[2]

[1]School of Environment, Enterprise and Development (SEED), University of Waterloo, Waterloo, Canada

[2]Department of Management and Marketing, College of Business and Economics, Qatar University, Doha, Qatar

Keywords: Generative AI, Global Marketing, Sustainability, Greenwashing, Cultural Adaptation, SDG Engagement, Systematic Literature Review, PRISMA 2020.

Introduction

Generative AI (GenAI) has moved rapidly into mainstream marketing practice, generating advertising content, personalising communication, and drafting ESG disclosures, just as organisations face intensifying pressure to align with the United Nations Sustainable Development Goals (SDGs). The convergence is not benign: the same capability that audits ESG statements can also fabricate CSR testimonials and scale persuasion across cultural markets, making the challenge structural and institutional rather than transient.

Purpose, Aim and Objectives

This systematic review synthesises peer-reviewed evidence at the intersection of GenAI, marketing, and sustainability, asking under what institutional conditions GenAI supports credible sustainability outcomes in global marketing. Three research questions address how GenAI use is governed for sustainability (RQ1), how it is integrated into marketing operations (RQ2), and how cultural context shapes GenAI-enabled sustainable marketing (RQ3).

Literature Review and Theoretical Framework

Prior reviews address adjacent territory but not the three-way intersection: Yadav and Sondhi (2023) map AI in sustainable marketing pre-ChatGPT; Al Lawati and Al Busaidi (2025) examine AI and green marketing with GenAI as one component; Cerchione et al. (2025) adopt a knowledge-management lens; and Israfilzade and Sadili (2025) review GenAI in e-

commerce. None maps this interaction as its primary focus; theoretical orientation is instead coded as a characteristic of the corpus itself.

Methodology and Methods

The review follows the PRISMA 2020 protocol (Page et al., 2021). Searches in Scopus, Web of Science, EBSCO, ProQuest and Emerald covered English-language publications from January 2020 to May 2026. From 1,330 records identified, 77 studies met the eligibility threshold. Studies were coded for integration pattern, evidence strength, GenAI specificity, geographic context, and SDG engagement through a novel three-tier scheme; a second reviewer audited full-text decisions (95.9% agreement).

Main Findings and Contribution

First, the GenAI–greenwashing paradox is structural: nine studies demonstrate GenAI as anti-greenwashing infrastructure while seven demonstrate it enabling greenwashing, the same capability driving both. Second, the field is strongest in operational integration (50 studies), developed in governance (32), and weakest in cultural adaptation (7); Sub-Saharan African contexts are absent. Third, SDG engagement is paradoxical: 77% of the corpus engages SDG-relevant themes, yet only 10% explicitly identifies specific SDGs. Fourth, five inductively derived integration patterns expose saturated clusters and underdeveloped intersections across six dimensions.

Originality and Value

The review introduces a three-tier SDG coding scheme; reframes the GenAI–greenwashing tension as a structural property of the technology rather than a governance failure; develops a six-dimension integration-pattern framework; and synthesises early causal evidence that GenAI can measurably shift sustainability outcomes when properly configured.

Research Limitations

The corpus captures a snapshot of a rapidly evolving field and will require updating. Restriction to English-language peer-reviewed publications likely contributes to the under-representation of Sub-Saharan African and Latin American contexts. Future work could extend the synthesis through bibliometric methods and cross-cultural primary research.

Theoretical and Practical Applications and Implications

The review repositions the question from whether GenAI is good or bad to the institutional conditions under which it tilts either way. Marketers should embed disclosure, audit, and verification capacity into GenAI workflows; ESG officers should incorporate the carbon footprint of GenAI inference into sustainability accounting; policymakers should pair disclosure with substantive content standards; and multinational organisations should validate GenAI-generated insights locally before scaling.

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MAPPING THE FAMILY SMEs EXPORTING FIELD: A REVIEW AND A RESEARCH AGENDA

Kampouri, Katerina[1]; Sklavounos, Nikolaos[2]; Simoglou, Efterpi[2]; Hajidimitriou, Yannis[2]

[1]School of Economics, Aristotle University of Thessaloniki, Thessaloniki

[2]Department of Business Administration, University of Macedonia, Thessaloniki, Greece

Keywords: family SMEs, family SME internationalisation, non-equity modes, exporting

Introduction

The internationalisation of family Small and Medium Enterprises (SMEs) has attracted considerable scholarly attention due to their distinctive internationalisation behaviour (Berrone et al., 2012). Despite this growing interest, existing reviews provide only a limited understanding of the key themes shaping research on family SME exporting (Arregle et al., 2021; Debellis et al., 2021), even though exporting constitutes the most common internationalisation mode for family SMEs, requiring lower resource commitment and offering greater flexibility than equity-based modes (Kuiken et al., 2024).

Purpose, Aims and Research Questions

Given that research on family SME exporting remains fragmented and lacks a synthesis of existing knowledge, the purpose of this study is to provide a foundation for the further development of this sub-field of inquiry. Specifically, this study aims to explore how exporting has been conceptualised and explored in the family SMEs internationalisation literature. We address two research questions: (i) What themes drive academic research on family SMEs' exporting? And (ii) What emerging key themes are likely to shape future inquiry in the family SMEs' exporting literature?

Methodology

To address the research questions, the study analyses and critically synthesizes empirical and conceptual studies published in peer-reviewed journals, following recommendations by methodological experts in review articles (e.g., Paul and Criado, 2020).

Findings and Contribution

The articles included in the data pool (n = 67) were published in 44 different academic journals between 1999 and 2025, with publication activity peaking in 2023. The majority of studies were published in the Journal of Family Business Strategy (six articles), followed by the Family Business Review (four articles), while the International Business Review and Journal of Management and Governance each published three articles. All of the studies, but one, were empirical (n= 66).

In organizing the literature on family SME internationalization, we identified two thematic categories i.e., (i) antecedents of exporting in family versus non-family SMEs and (ii) the role of socio-emotional wealth in the exporting behaviour of family SMEs. By critically assessing the findings in each thematic category, the study elaborates on the theoretical and the methodological approaches used and discusses key findings and promising areas for future research.

Originality/value

The study provides a comprehensive map of family SMEs' exporting research and enables a coherent understanding of the factors shaping family SMEs' exporting decisions. It also proposes exemplary research questions to support future research.

Research Limitations

The main limitation of this study is that it focuses exclusively on exporting, excluding other non-equity entry modes used by family SMEs.

Theoretical and Practical Applications and Implications

The findings may assist family managers and practitioners in better understanding the contextual factors shaping exporting decisions. The study may also contribute to theoretical discussions relating to family SMEs internationalisation by providing an understanding of the mechanisms underlying family SMEs' decisions to continue, discontinue, or progress beyond exporting towards more committed entry modes.

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DIGITALIZATION, EMERGING TECHNOLOGIES, AND SMES INTERNATIONALIZATION: A SYSTEMATIC LITERATURE REVIEW

Tchuinou Tchouwo [1]; Ben Selma Majdi[2]; Chebbi Hela[3]

[1,2,3] University du Quebec in Montréal (ESG UQAM), Montréal, Canada

Keywords: digital transformation, international business, blockchain, artificial intelligence

Introduction, Purpose and Aim

The internationalization of small and medium-sized enterprises (SMEs) has long been explained by models based on the gradual accumulation of resources and knowledge. However, the rapid spread of digital technologies has profoundly transformed these trajectories, reducing barriers to entry into foreign markets and changing modes of access, learning, and value creation. Recent literature emphasizes that digitalization is no longer just a tool to support internationalization, but a strategic lever that shapes the international trajectories of SMEs (Westerlund, 2020).

This systematic review aims to analyze the role of digitalization and emerging technologies in the internationalization of SMEs by synthesizing the contributions, trends, and gaps identified in two complementary series of scientific articles.

Methodology

To conduct the systematic literature review, we used three categories of keywords relating to digital technologies, the internationalization process, and the SME context. These keywords were combined to obtain the following string of characters: (ICT OR “big data” OR iot OR “digital transformation” OR “digital technologies” OR blockchain OR “social media” OR cyberspace OR “artificial intelligence” OR “virtual reality” OR digital* OR “disruptive technologies” OR “Industry 4.0” OR “information technologies” OR e-commerce OR “digital economy” OR e-business) AND (internationali* OR “international growth” OR “international expansion” OR “international business” OR “international entrepreneurship” OR “international expansion” OR “global business”) AND (sme*)

The searches were conducted in the title, abstract, and keywords within three main academic databases: Scopus, ABI Inform Global, and Web of Science. The selected articles had to be

peer-reviewed academic publications explicitly addressing the role of Industry 4.0 technologies in the internationalization process of SMEs. The articles from the various databases were then imported into Covidence software to facilitate collaborative work.

A total of 461 articles were included in the initial Covidence database. After removing 174 duplicates, 287 articles were selected for the first stage of screening. The initial screening consisted of checking the inclusion criteria based on the article title and abstract. At the end of this stage, 164 references were deemed irrelevant and excluded, while 123 articles were retained for the next stage.

Main Findings and Contributions

A first set of studies highlights the central role of digital technologies in identifying and seizing opportunities for internationalization. Digital capabilities, combined with organizational agility, strengthen SMEs' ability to identify opportunities in uncertain environments (Omri, Yezza & Bécuwe, 2023). However, several studies emphasize that the adoption of digital technologies does not have a direct effect on internationalization, but rather that their impact depends on their integration into organizational processes, internal skills, and managerial practices (Cassetta et al., 2020). Critically, these dynamics are shaped by SME-specific characteristics that distinguish them from larger firms.

Resource constraints limit the scope and pace of digital adoption, while the central role of the owner-manager means that individual digital literacy and strategic vision disproportionately influence technology integration decisions. Moreover, the liability of smallness reflected in limited financial slack, reduced bargaining power, and narrower human capital bases conditions how SMEs translate digital capabilities into international performance. The heterogeneity across SME types (family firms, micro-enterprises, high-growth ventures) further complicates generalizations, calling for more fine-grained theorization grounded in SME-specific frameworks.

Furthermore, the literature highlights the growing importance of digital platforms, social networks, and websites as virtual gateways to international markets. These tools promote the international orientation of SMEs, facilitate learning about foreign markets, and reduce costs associated with geographical distance (Lee et al., 2022). Digital platforms also appear to accelerate the speed and scope of internationalization, although their effects remain heterogeneous across sectors and institutional contexts (Da Rocha et al, 2024).

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GRIT IN VIRTUAL TEAMS: A TWO-STAGE MODEL

Márki, Gábor[1]; Alon, Ilan[1,2]*; Taras, Vas[3]*; Levy, Shalom[1]

[1]Department of Economics and Business Administration, Ariel University, Ariel, Israel

[2]Institute of Strategy and Management, Department of Strategic Management, Corvinus University, Budapest, Hungary

[3]Department of Management, University of North Carolina at Greensboro, USA

*(Corresponding Author)

Keywords: Grit, Self-Efficacy, Machine Learning, Virtual Teams, AI, Future of Work.

Introduction

Global virtual teams (GVTs) are the norm in international business (IB), prompting a rethinking of the role of perseverance (Bernardy & Antoni, 2021; Duckworth et al., 2007) as a driver of success. Geographic dispersion, digital reliance, and cultural diversity affect performance (Hofstede, 1980). The "friction paradox" explores whether automation reduces external friction while impacting internal resilience.

Purpose, Aim, and Objectives

The study explores how functional capabilities shape a digital transition cohort facing "cognitive debt" from technology dependence (Kasneci et al., 2023) and whether internal agency predicts grit better than external structure. It analyzes grit antecedents (Perseverance of Effort, PE; Consistency of Interest, CI) through Social Cognitive (H1), Cultural Dimension (H2), and Cognitive Load (H3) models to assess psychological and situational factors (Sweller, 1988).

Literature Review and Theoretical Framework

Although grit is important for adaptive performance, its distinction from conscientiousness and self-control remains debated (Credé et al., 2017). We define grit as flexible agentic control (Bandura, 1986). Effective grit ($Grit_e$) is expressed as:

$$Grit_e = Grit_i + (M \times SE) / CF$$

Here, $Grit_i$ represents intrinsic grit, *M* motivation (Dweck, 1986), *SE* self-efficacy, and *CF* contextual friction. First-language complexity (L_1C) (Brosa Rodríguez et al., 2024) can support mental resistance and grit development. Thus, grit is a dynamic behavioural expression shaped by motivation and context, rather than a fixed trait.

Methodology and Methods

A quantitative, cross-sectional design using X-Culture data [N = 11,761] from 100+ countries (Taras et al., 2025) analysed 64 indicators across psychological, cultural, linguistic, and macroeconomic domains. Automated machine learning (Alon et al., 2023) identified nonlinear patterns using a Light Gradient Boosted Trees model, validated by OLS regression for robustness.

Main/Expected Findings and Contribution

Results reflect relative predictive relationships rather than direct causal pathways and identify a two-stage asymmetric hierarchy. Stage 1 (Core-Periphery Split) confirms the Agentic Core's dominance. Motivation (LGO) is a precondition (Dweck, 1986). *SE* acts as a force multiplier, transforming this stock into performance. Stage 2 (Peripheral Drag) shows how *CF* (via Linguo-cultural Distance) influences core efficiency. Internal agency exerts a multi-fold predictive influence over external factors.

Originality and Value

We identify a friction paradox in which a lack of resistance stalls or drifts consistency, shifting grit's focus from outcomes to antecedents. Agency prevents digital efficiency from undermining resilience.

Research Limitations

This design provides a snapshot, limiting causal claims. High-dimensional data and structural nuance partially mitigate potential self-report bias; however, replication in professional GVT settings and longitudinal designs would strengthen causal inference.

Theoretical and Practical Applications/Implications

This study makes three contributions. First, it clarifies effective grit´s antecedents, showing self-efficacy and learning goal orientation as dominant predictors. Second, it distinguishes internal agency from contextual friction, revealing that psychological core drivers remain resilient despite environmental drag. Third, it demonstrates how AML complements theory by identifying the relative predictive importance of psychological, cultural, linguistic, and demographic predictors. These findings suggest that AI should serve as a tutor rather than an answer engine; friction-reducing automation may lower intrinsic motivation, requiring deliberate task design in MNEs. Structured difficulty is essential for building grit; removing challenges may inadvertently stunt perseverance.

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EMERGENT STRATEGY AND STRATEGIC CHANGE IN PRACTICE: EVIDENCE FROM CASES IN THE AGRIFOOD AND WINE INDUSTRIES

Mybes, Katharina[1]; Hanf, Jon H.[1]

[1]Institute for Wine and Beverage Business / Economics, Hochschule Geisenheim University, Geisenheim, Germany

Keywords: Emergent strategy, change, disruption, case examples, wine industry

The agricultural sector, including the wine industry, currently experiences a multitude of impacts at once which disrupt the market environment: disrupted value chains due to geopolitical instabilities, imposed tariffs and increased production prices, changing consumer preferences paired with overproduction have caused prices to plummet, forcing numerous smaller players out of the market. Traditional markets are saturated and new outlets more difficult to access. Climate extremes and natural disasters aggravate working conditions. The global pandemic has shown that firms need to be able to react to even unforeseeable circumstances to ensure survival. These developments impact the agricultural sector, particularly traditional organizations like the wine industry (Henchion et al., 2024).

Anticipating this changing world, the concept of emergent strategy is an evolutionary process that responds to internal and external factors (Lynch, 2009; Mintzberg et al., 2009). It offers a more realistic perspective on strategizing in dynamic environments than static or linear strategizing. Strategic problems are inherently complex and multifaceted, which makes it impossible to fully analyze (Wit and Meyer, 2010). While strategic research is extensive, “neither theory nor practice of strategy has kept pace with the realities of today’s relatively boundaryless and barrier-free markets” (Kinni, 2014).

As a “means by which deliberate strategies change”, emergent strategy describes unintended patterns or consistencies in organizational behavior over time (Mintzberg and Waters, 1985). These patterns are implemented in the realized strategy of a firm and are integrated into the overall organizational strategy by retrospect sense-making (ibid, 1985).

They often are found in organizations responding directly or indirectly to change in their internal and external environment. Underlying organizational structures and characteristics are important to determine the organization's ability to identify threats or opportunities and its response (Mybes and Hanf, 2025; Adner and Helfat, 2003).

While the theoretical basis has been developed over 50 years ago, it proves more relevant today in this dynamic market environment than ever before. The drawback of Mintzberg's abstract theoretical construct of emergent strategy is that it remained mostly theoretical, lacking an extensive portfolio of empirical research and operationalization, making it "hard to grasp". As a consequence, popularity remained limited and existing empirical research focuses on specific types of organizations and sectors. Hence there are limited advancements of the theoretical concept. In order to derive strategic implications and recommendations for organizations, the individual components of the concept must be investigated for a better understanding of impact and interplay. This gap shall be closed with this paper, translating the abstract theoretical construct into concrete organizational practice. By providing different case examples and analyzing their individual components, key levers and their impact are identified. It makes the theoretical basis of emergent strategy more accessible and provides a foundation for further research.

The breakdown into the core components aims to help practitioners better identify such events in their internal and external environment. By doing so, they can improve recognition and integration of new strategic responses into their overall strategy.

Furthermore, the cases show that "deliberate and emergent strategies may be conceived as two ends of a continuum along which real-world strategies lie" (Mintzberg and Waters, 1985). Highlighting this continuum is a more realistic representation of organizational strategizing, further reducing the abstract nature of the theoretical concept. Different case examples of emergent strategy in the agri-food industry show steps leading to survival during crises, new business ventures, fundamentally shaping their unique strategic positioning and differentiation, or improving their portfolio. The responses lead to market creation, differentiation, increased customer engagement, and a sustained competitive advantage.

In a step-wise approach, 8 international cases were identified based on primary and secondary research. Three cases were dropped due to insufficient information. The remaining 5 cases include four winery-related cases and one farming case. 5 cases cover current events, one case is based on

a well-documented historic event. Followed up by additional secondary research and in-depth semi-structured interviews, details were obtained on preceding events, key components, internal antecedents and individual strategic decision-making. The individual parts of the overall strategy process (based on Mintzberg and Waters, 1985) were analyzed and evaluated. A step-by-step account leading up to the response and strategic integration is presented. A comparison of the cases and case components highlight that emergent strategic components will present themselves differently in different firms and organizational structures. This awareness makes the theoretical concept more palpable, approachable and highlights its relevance for organizational responses to today's disruptive market environments.

The main contribution is to provide a comprehensive account of emergent strategy examples – a theoretical construct which has been commonly neglected or insufficiently addressed due to its abstract nature. This is highly relevant for both scholars and practitioners, as it demystifies the process and provides a grounded account of how emergent strategies arise, enabling organizations to identify and adapt key factors to enhance their capacity to respond to technological change, innovation, and disruption. Providing examples from the agri-food sector adds to the field of research, as it has not been subject to research in this context.

As a conceptual study, it does not allow or aim for generalization. Future research could employ this study's components for a coherent analysis when designing a quantifiable, statistically significant research setting for broader generalization.

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A POINT-OF-SALE EXPERIMENT ON THE INFLUENCE OF THE REGION OF ORIGIN ON THE CHOICE OF ORGANIC WINE

Salvador, Pedro[1,2]; Casais, Beatriz[1,2]; Pinto, Lígia[1,2]

[1] School of Economics, Management and Political Sciences, University of Minho, Braga, Portugal

[2] iBMS – Centre for Research in Business, Markets & Society, University of Minho, Braga, Portugal

Keywords: organic wine; region of origin; willingness to pay; sensory evaluation; certification; point-of-sale experiment

Introduction

Increasing consumer concern for sustainability, health, and ethical production practices (Apaolaza et al., 2017; Delmas and Grant, 2014) has fostered the development of organic wine markets. Prior research identifies certification, price premiums, sensory expectations, naturalness perceptions, and sustainability-related information as key drivers of organic and sustainable wine choice (Apaolaza et al., 2017; Bazzani et al., 2024; Borrello et al., 2024; Delmas and Grant, 2014; Modica et al., 2025). Recent evidence further suggests that consumers' willingness to pay depends not only on sustainability attributes but also on their interaction with region-of-origin information, territorial reputation, trust, and other extrinsic quality cues (Dominici et al., 2025; Gastaldello et al., 2025; Larvoe and Kallas, 2025).

Portugal provides a distinctive context because organic wine remains a relatively underdeveloped market segment, while region of origin has long served as a dominant signal of wine quality and authenticity (Ferreira, Lourenço-Gomes and Pinto, 2021). This setting enables examination of whether sustainability-related attributes can modify established evaluation patterns or whether traditional regional cues continue to dominate consumer valuation. Although previous research shows that region-of-origin information influences both sensory evaluations and willingness to pay (Ferreira, Lourenço-Gomes and Pinto, 2021), relatively few studies have examined sequential revisions of willingness to

pay following blind tasting and subsequent region-of-origin disclosure in real point-of-sale environments using incentive-compatible valuation mechanisms (Ferreira, Costa Pinto and Lourenço-Gomes, 2021).

Purpose, Aim and Objectives

This study examines how consumers evaluate organic wine in a real point-of-sale environment in Portugal by integrating sensory experience, extrinsic information cues, and incentive-compatible economic valuation. Specifically, it analyses: (i) the relative importance of organic production compared with other wine attributes; (ii) the role of sensory evaluation in shaping initial willingness to pay (WTP) under blind tasting conditions; (iii) the effect of region-of-origin disclosure on WTP; and (iv) patterns of WTP revision following information disclosure. The study therefore examines how sustainability attributes interact with traditional quality cues in shaping consumer valuation.

Literature Review and Theoretical Framework

The study draws on Cue Utilization Theory, Signaling Theory, and Credence Goods Theory to explain how consumers rely on extrinsic quality signals such as certification and region of origin when intrinsic quality cannot be fully assessed before purchase (Darby and Karni, 1973; Spence, 1973; Steenkamp, 1990). In organic wine markets, sustainability claims and certification function as credence cues, while recent evidence shows that consumer preferences and willingness to pay are shaped by their interaction with trust, sensory expectations, naturalness perceptions, and territorial reputation (Apaolaza et al., 2017; Bazzani et al., 2024; Borrello et al., 2024; Delmas and Grant, 2014; Dominici et al., 2025; Larvoe and Kallas, 2025; Modica et al., 2025). This theoretical perspective supports the study's sequential valuation approach, whereby consumers first evaluate wines under blind tasting conditions and subsequently revise their willingness to pay following region-of-origin disclosure.

Methodology and Methods

An experimental point-of-sale study was conducted with 49 participants in a specialised organic wine retail store in Braga, Portugal. Participants evaluated three organic wines

from established Portuguese wine regions and stated their initial willingness to pay (WTP) under blind tasting conditions. Region-of-origin information was subsequently disclosed, after which participants revised their WTP. An incentive-compatible Becker–DeGroot–Marschak mechanism elicited economically meaningful valuations. A post-tasting questionnaire collected socio-demographic data and measures of wine preferences, sustainability perceptions, trust in certification, self-assessed wine knowledge, social interaction, and price sensitivity. Data were analysed using descriptive statistics and paired comparisons.

Main Findings and Contribution

Individual sensory attributes are not significantly correlated with initial willingness to pay (WTP), whereas overall satisfaction shows a strong positive association, suggesting that consumers rely on holistic evaluations rather than isolated sensory characteristics. Region-of-origin disclosure produces a statistically significant increase in WTP overall, with significant effects for Douro and Dão wines, while only percentage increases are observed for Alentejo. Most participants do not revise their WTP after information disclosure; however, when revisions occur, they are predominantly upward. WTP appears bounded, with a median increase of approximately 13%, suggesting that sustainability attributes create economic value primarily when reinforced by established regional quality cues. The study therefore extends cue-based explanations of organic wine choice by demonstrating the complementary role of sustainability and region-of-origin information in consumer valuation.

Research Limitations

The findings are exploratory and context-specific to a specialised retail setting, limiting generalizability.

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STRATEGIC MOTIVATIONS FOR ADOPTING CRYPTOCURRENCIES IN THE WINE INDUSTRY

Kramer, Michael Paul[1]; Hanf, Jon H.[1]

[1]Professorship of International Marketing Management, Hochschule Geisenheim University, Geisenheim, Germany

Keywords: cryptocurrencies, technology adoption, value creation, dynamic capabilities, wine industry

Introduction

This study explores why firms in the wine industry adopt cryptocurrencies as payment instruments and how they expect this adoption may contribute to strategic value creation. Cryptocurrency is a decentralized digital asset utilizing cryptography to secure transactions, manage issuance of new units, and verify asset transfer independently of a central authority (Nakamoto, 2008). It operates on a distributed ledger such as blockchain, Holochain, Hashgraph, or Directed Acyclic Graphs, which ensures transparency and immutability. This study empirically focuses on Bitcoin and examines managerial intentions in an industry characterized by cautious and uneven digital innovation adoption and only moderate digital maturity (International Organisation of Vine and Wine, 2021; Knitsch and Weltz, 2021; Loose, 2024). In contrast to this conservative setting, Bitcoin is a decentralized electronic payment system, enabling peer-to-peer transactions and replacing trust in third parties by cryptographic proof (Nakamoto, 2008). It operates on blockchain, a distributed ledger technology (DLT) (Kramer et al., 2021) where transactions are grouped into data blocks. These blocks are verified and added to the blockchain approximately every 10 minutes through Proof of Work (PoW) consensus mechanism, with each block cryptographically linked to the preceding one, to ensure an immutable ledger.

While the industry remains cautious about digital transformation, consumer engagement with digital assets has increased. By 2024, more than 10% of adults in most European countries held crypto assets (European Central Bank, 2025). Industry reports indicate that customers paying with cryptocurrencies generate higher order values and that a substantial share are new customers (Capital One, 2025; Forrester Consulting, 2025). While trust in cryptocurrency payments influences consumer willingness to interact with firms offering such options (Mutambik et al., 2024), evidence from other industries report mixed adoption effects (Eshghi and Farivar, 2025; Bahmani, 2025), highlighting the need to examine an-

ticipated value creation at the firm level. In the wine industry, previous research has primarily focused on blockchain applications for traceability and fraud prevention rather than payment adoption (International Organisation of Vine and Wine, 2021; Parry et al., 2024; Kramer et al., 2024). Given the wine industry's cautious approach to digital innovations this study asks:

> *What motivates firms in the wine industry to integrate cryptocurrencies as payment instruments and which strategic outcomes do they associate with this adoption?*

This study extends research on blockchain and cryptocurrency adoption in the wine industry by conceptualizing cryptocurrencies beyond their role as payment instruments as part of sensing capabilities of wineries. Theoretically, it extends dynamic capability theory to cryptocurrency payment adoption and by integrating signaling theory conceptualizes cryptocurrency payments as a combined sensing and signaling mechanism through which wineries examine market reactions, attract digitally oriented customer segments, and signal innovativeness. The study aims to provide empirical evidence on motivations and perceived strategic outcomes of cryptocurrency adoption in an industry characterized by credence signals.

Theoretical Framing

Dynamic capability theory provides the primary interpretive lens (Teece et al., 1997). Under this lens, adopting payment innovations can be conceptualized as a sensing activity through which wineries test market receptiveness, engage digitally oriented customer segments, and potentially signal innovativeness and future readiness (Spence, 1973).

Methodology

The study adopts an exploratory qualitative design based on semi-structured interviews with owners and managers of wine firms worldwide that have adopted cryptocurrencies. Interviews address motivations for adoption and anticipated benefits and value creation mechanisms. Data are analyzed inductively following the Gioia methodology (Gioia et al., 2013).

Expected Findings

The study is expected to show that cryptocurrency adoption is primarily motivated by strategic considerations such as innovation signaling, brand positioning, customer engagement, and experimentation rather than operational necessity.

Conclusions and Implications

This ongoing study is expected to contribute to digital transformation research in the wine sector by framing cryptocurrency adoption as a strategic rather than purely technical decision. Building on dynamic capability theory it anticipates conceptualizing adoption as a sensing activity. From a managerial perspective, it is expected to indicate that cryptocurrencies can serve as tools for strategic positioning and customer engagement.

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A DELPHI-ANP-ADAM FRAMEWORK FOR ASSESSING THE SUSTAINABILITY PERFORMANCES OF WINERIES

Miglietta, Pier Paolo[1]; Agnusdei, Leonardo[2], De Bernardi, Paola[3]; Agnusdei, Giulio Paolo[4]

[1]Department of Biological and Environmental Sciences and Technologies, University of Salento, Lecce, Italy
[2]Department of Engineering, Pegaso University, Naples, Italy
[3]Department of Management "Valter Cantino", University of Turin, Turin, Italy
[4]Department of Psychology and Health Sciences, Pegaso University, Naples, Italy

Keywords: Sustainability assessment, Delphi method, Multi-criteria decision-making (MCDM), Wine sector, Synthetic index

Introduction

Sustainability has become a central paradigm for agri-food systems, driven by global initiatives such as the Sustainable Development Goals (SDGs), the European Green Deal and the Farm to Fork Strategy (Guerrieri et al., 2025). From a theoretical perspective, the Natural Resource-Based View suggests that sustainability-oriented practices can generate competitive advantage and foster green innovation (Martínez-Falcó et al., 2024, 2025), while Stakeholder Theory highlights the need for firms to respond to the growing environmental and social expectations of stakeholders through transparent ESG practices (Martínez-Falcó et al., 2025). At the firm level, the Environmental, Social and Governance (ESG) framework provides a structured standard for embedding sustainability principles into corporate strategies and decision-making processes. The wine sector, while economically and culturally significant, is highly exposed to climate change and market pressures, as reflected in the recent decline in global vineyard area and wine production. However, sustainability assessment remains methodologically challenging due to subjectivity in indicator selection, weighting and aggregation (Opon & Henry, 2020). To address these limitations, this study proposes an integrated multi-criteria framework combining the Analytic Network Process (ANP) and the Axial Distance-based Aggregated Measurement (ADAM) method to provide a multidimensional evaluation of sustainability performance in Italian wine companies.

Methodology

This study adopts an integrated and sequential methodological framework combining Delphi, ANP and ADAM to assess sustainability performance in wine growers and wineries (Figure 1).

The process starts with the Delphi method, used to identify and validate a set of sustainability indicators through structured expert consultation.

Starting from the ESG4AGRI questionnaire, an initial set of indicators grouped into four ESG criteria was submitted to a multidisciplinary expert panel, made up of 15 academics, 15 specialists in corporate sustainability and ESG reporting and 10 professional practitioners from the agricultural sector. Through iterative rounds and a predefined consensus threshold, the most relevant indicators were selected for subsequent analysis.

The Analytic Network Process (ANP) is then applied to structure the decision problem and model interdependencies among criteria and sub-criteria (indicators). Pairwise comparisons are conducted to obtain a limited supermatrix, in which the relative weights of criteria and sub-criteria are provided.

Finally, the ADAM method, a geometry-based multi-criteria decision-making technique, was adopted to aggregate weighted indicators into a synthetic sustainability score. At this stage, different companies represent the alternatives and are evaluated using empirical indicator values corresponding to the criteria and sub-criteria previously weighted through the ANP. These values are normalized on a nine-point scale to ensure comparability across indicators and consistency with the weighting structure derived from the pairwise comparison process. The method then assesses each company by calculating the volume of a polyhedron built within a three-dimensional coordinate system. The maximum volume is considered as the ideal condition (score equals to 100), whereas the minimum corresponds to the anti-ideal condition (score equals to 0), and the sustainability score for each company is obtained through linear normalization within this range.

The framework was tested on 32 wineries located in two wine-growing regions of southern Italy, that are Salento (Apulia) and Irpinia (Campania).

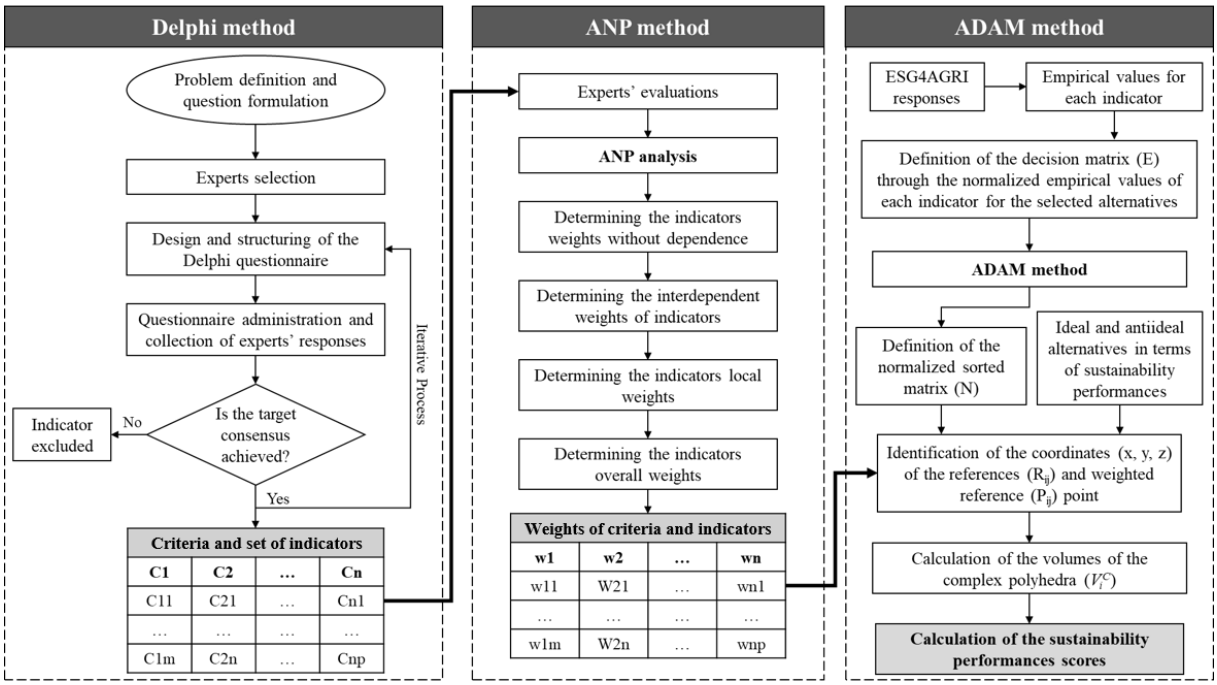


Figure 1: Methodological framework

Results and discussion

After three iterative rounds of expert consultation, the Delphi process resulted in the selection of 13 sustainability indicators. Indicators achieving the predefined consensus threshold were retained, ensuring both scientific robustness and sectoral relevance.

The ANP analysis was subsequently applied to determine the relative importance of criteria and indicators, considering the interdependence among them. Results indicate that Criterion 2 received the highest overall weight (0.486), followed by Criterion 1 (0.200), Criterion 3 (0.197) and Criterion 4 (0.117).

Criteria	Weights	Indicators	Weights
Criterion 1: Products and strategies contributing to healthy and sustainable dietary patterns	0.200	Percentage of products displaying sustainability information certified or verified by third-party organizations	0.057
		Number of initiatives promoting sustainable consumption of products, beyond those mandated by law	0.119
		Product safety: Number of food safety analyses conducted in addition to those required by law	0.023
Criterion 2: Social and environmental sustainability of operations and internal processes	0.486	Training hours per employee	0.104
		Percentage of women out of total employees	0.100
		Percentage of employees out of total workers	0.175
		Electricity consumption per revenue	0.017
		GHG emissions per revenue	0.061
		Water consumption per revenue	0.029
Criterion 3: Corporate commitment to promoting and fostering a sustainable supply and value chain	0.197	Percentage of expenditure on local suppliers out of total supplier expenditure	0.197
Criterion 4: Corporate citizenship	0.117	Percentage Number of main activities or projects carried out in support of the local community	0.036

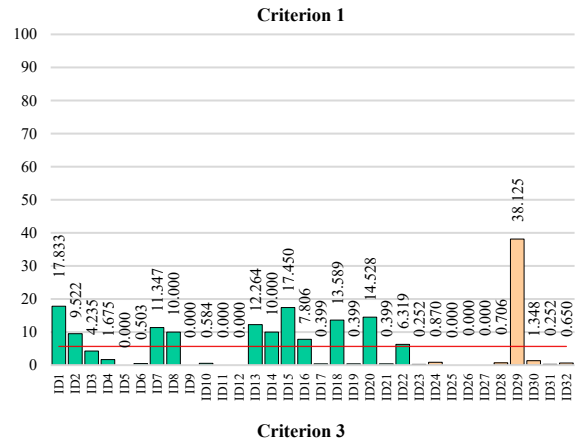
		Number of stakeholder engagement initiatives	0.069
		Percentage of women in governance positions	0.012

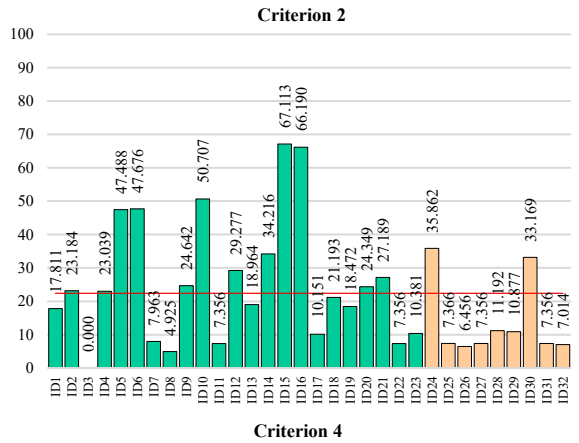
Table 1: Weights for criteria and indicators calculated through ANP

The ADAM method highlights different sustainability patterns across the four criteria. Consistent with the ANP weighting structure, the highest performance levels are observed in Criterion 2, confirming the strategic centrality of internal management practices. Criterion 3 also displays relatively strong results, suggesting that reliance on local suppliers and short supply chains represents a consolidated dimension within the sector.

On the other hand, product-related strategies and corporate citizenship emerge as comparatively weaker areas. The limited performance in these criteria indicates that external communication, stakeholder engagement and community-oriented initiatives remain underdeveloped relative to internal processes.

The overall distribution of composite sustainability scores is moderately concentrated in the lower-to-mid performance range, with few firms reaching advanced levels. This configuration suggests an intermediate stage of sustainability maturity, characterized by heterogeneous progress and incremental adaptation rather than systemic transformation (de Almeida Santos et al., 2020). Regional comparison further indicates that contextual factors (such as market exposure, structural conditions, and innovation ecosystems) shape both variability and performance trajectories across enterprises.





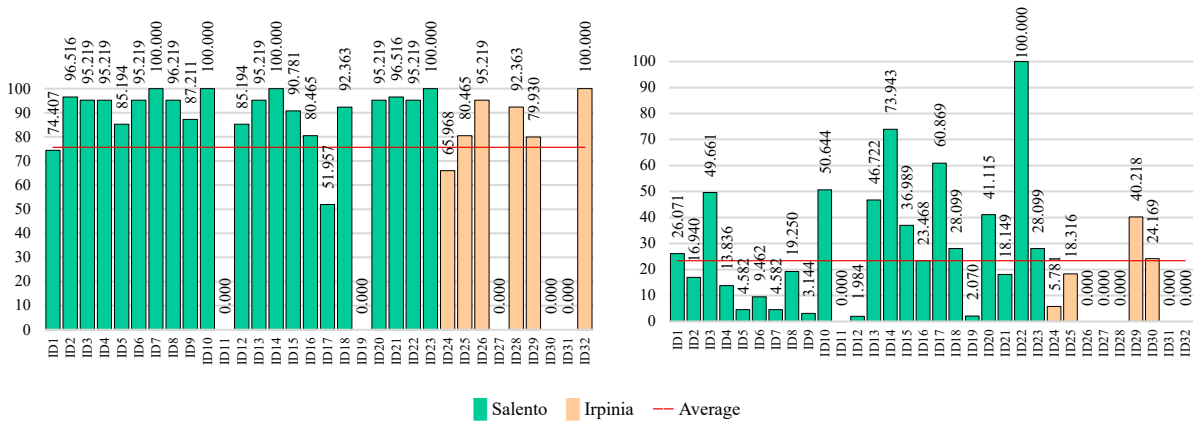


Figure 2: Criterion scores calculated through ADAM

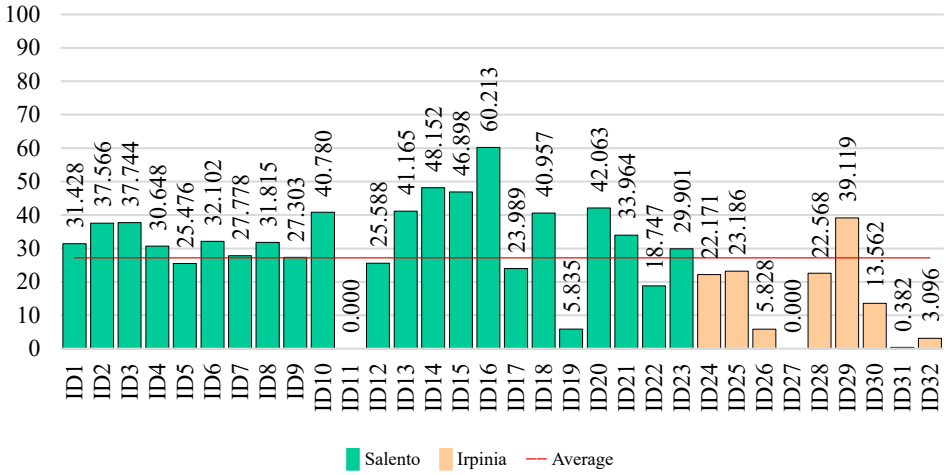


Figure 3: Overall sustainability scores calculated through ADAM

Conclusions

This study demonstrates the analytical robustness and practical applicability of the integrated Delphi–ANP–ADAM framework for assessing sustainability performance in the wine sector. By combining expert-based indicator selection, systemic weighting and geometric aggregation, the approach enhances transparency and comparability in multidimensional evaluation. However, several limitations must be acknowledged. The analysis is restricted to a relatively small sample of wineries located in two regions of southern Italy, limiting external generalizability. The cross-sectional design does not capture dynamic sustainability trajectories over time and reliance on expert judgment may introduce residual subjectivity.

Future research should expand the sample size, incorporate longitudinal data and test the framework across diverse agricultural contexts to strengthen empirical validation and scalability.

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COLLABORATIVE STRATEGIES IN PORT-BASED FREE ZONES: STRATEGIC INTEGRATION WITH THE PORT OF LUANDA FOR AGRIFOOD VALUE CHAIN DEVELOPMENT

Chkoniya, Valentina[1]; Bengue, Alberto Antonio[2]

[1]Polytechnic University of Coimbra, Coimbra, Portugal

[2]University of Aveiro, Aveiro, Portugal

Keywords: Agrifood Business; Free Zones; Port Strategy; Collaboration; Value Chains; Logistics Integration; Angola; Port of Luanda

Introduction

The increasing complexity of global agrifood systems has intensified the need for integrated logistics, efficient distribution networks and cross-sector collaboration, particularly in emerging economies. Port-based free zones can facilitate trade, investment, and value chain development. The Port of Luanda represents a critical gateway for Angola's agrifood sector; however, limited integration between free-zone activities and port operations constrains logistics efficiency, value creation and regional competitiveness.

Purpose, Aim and Objectives

This study examines how collaborative strategies can strengthen the integration of port-oriented free zones with the Port of Luanda and support agrifood value-chain development. It aims to identify mechanisms to improve coordination among port authorities, logistics providers, agrifood firms, and policymakers. The objectives are to examine collaboration mechanisms, identify institutional and operational barriers, and explore strategies to improve information sharing, logistics, and value-added activities.

Literature Review and Theoretical Framework

The study draws on cluster development, supply chain integration, and inter-organisational collaboration theories. Port governance research highlights the importance of institutional

coordination and context-specific implementation (Sabbagh *et al*., 2024). Free zones are conceptualised as collaborative ecosystems where public and private actors can co-create value. Dynamic capabilities and organisational coordination can strengthen competitiveness (Chaudhuri *et al.*, 2025), while applied data science can support information-based coordination (Chkoniya, 2021). Agrifood supply-chain optimisation further emphasises coordinated value creation (Fiore *et al.*, 2018).

Methodology and Methods

A qualitative case study focused on the Port of Luanda and connected free-zone activities. Semi-structured interviews were conducted with port administrators, agrifood operators, logistics providers and government representatives. Documentary analysis complemented the interviews through policy, infrastructure and trade documents. Thematic analysis identified patterns concerning collaboration, governance, information sharing, regulatory coordination and operational integration (Doppen *et al.*, 2025).

Findings and Contribution

Findings indicate fragmented stakeholder collaboration, institutional misalignment, regulatory inconsistencies and limited information sharing. Infrastructure and logistical bottlenecks particularly constrain perishable agrifood products requiring timely handling and cold-chain logistics. Nevertheless, public-private partnerships, integrated logistics platforms, joint planning, shared digital information systems, and trust-based relationships provide opportunities for stronger coordination. Integration could also enable processing, packaging and quality certification within free zones (Fiore *et al.*, 2018).

Originality and Value

The study extends cluster and supply-chain perspectives to port-based free zones in an emerging economy. Its originality lies in conceptualising the port–free-zone relationship as a collaborative ecosystem rather than solely as transport infrastructure. It identifies governance and coordination mechanisms that link logistics integration to agrifood value creation and competitiveness.

Research Limitations

The qualitative single-case design limits statistical generalisation. Findings also reflect selected stakeholder perspectives and the institutional context of Luanda. Comparative research across emerging-market ports could extend the findings.

Theoretical and Practical Applications and Implications

The study demonstrates the relevance of collaborative governance, supply chain integration, and cluster perspectives for port-centred agrifood ecosystems. Managers should participate actively in collaborative networks, while policymakers should align infrastructure investment, regulatory coordination and digital information systems. Stronger integration of the Port of Luanda free zone could support Angola's agrifood competitiveness, regional trade, and economic diversification (World Bank, 2025).

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EVALUATING THE IMPLEMENTATION OF GREEN ENERGY PRINCIPLES IN LITHUANIA: INSIGHTS FROM LMDI DECOMPOSITION AND REGRESSION ANALYSIS

Gindrutė Kasnauskienė[1]; Evelina Akinytė[2]; Saulius Preidys[3];Viktorija Cohen[4]; Neringa Ramanauskė[5]

[1]Department of Quantitative Methods and Modelling, Vilnius University, Vilnius, Lithuania

[2]Department of Quantitative Methods and Modelling, Vilnius University, Vilnius, Lithuania

[3]Department of Organizational Information and Communication Research, Vilnius University, Vilnius, Lithuania

[4]Department of Economic Policy, Vilnius University, Vilnius, Lithuania

[5]Department of Department of Theoretical Economics, Vilnius University, Vilnius, Lithuania

Keywords: Green energy, Lithuania, LMDI decomposition, CO_2 emissions, energy efficiency, OLS regression

Introduction

The global shift towards a low-carbon economy has evolved from an environmental niche concern into a fundamental pillar of national economic strategy. For Lithuania, this transition is inextricably linked to the European Union Green Deal (European Commission, 2019), which requires a thorough transformation of energy systems in order to achieve climate neutrality (LR Žemės Ūkio ministerija, 2021). This study is significant because Lithuania is striving for total energy independence from fossil fuels, while also navigating the financial and technological constraints that are inherent in a smaller economy (Li et al., 2015). As the country integrates into the EU's green energy infrastructure, it is vital to evaluate the efficacy of these strategic principles to ensure sustainable economic growth and national security.

Purpose, Aim and Objectives

The primary aim of this research is to evaluate the practical implementation of green energy principles in Lithuania using a rigorous quantitative approach, moving beyond policy rhetoric to empirical verification. The study is guided by four key objectives: (1) synthesising existing literature on green energy dimensions; (2) curating and visualising multi-decade Lithuanian energy datasets; (3) executing a Logarithmic Mean Divisia Index (LMDI) decomposition

alongside an Ordinary Least Squares (OLS) regression to map causal drivers; and (4) formulating evidence-based policy recommendations to optimise the transition path.

Literature Review

In the field of energy economics, theoretical frameworks are employed to categorise green principles into four distinct dimensions: decarbonisation, energy efficiency, technological advancement and energy security. While the European Union provides a unified policy umbrella and has experienced a surge in renewable integration, scientific literature highlights that smaller developing markets often encounter 'green bottlenecks' — institutional and financial barriers that impede the scaling of clean technology (Herce et al., 2024). The transition mechanisms that are effective in mature economies do not invariably exhibit linear scalability in smaller, rapidly developing markets such as Lithuania. Despite its rapid growth, Lithuania still faces significant infrastructure modernisation challenges compared to leaders such as Germany and Sweden (Landes, 2025; OECD, 2025). The research gap pertains to the contextual efficacy of green principles within "fast followers" developing markets, in accordance with the energy economics framework and the specific context that has been provided.

Methodology and Methods

The research employs a sophisticated, two-tiered quantitative methodology designed to move beyond the limitations of existing qualitative literature. Adopting a strictly empirical approach ensures analytical transparency and international comparability, providing a rigorous assessment of the drivers behind Lithuania's energy transition. Firstly, the Logarithmic Mean Divisia Index (LMDI) additive decomposition is utilised to disaggregate changes in energy consumption into activity, structural and intensity effects. The selection of this method is predicated on its path-independent properties and its capacity to manage zero values in datasets. Secondly, in order to complement the structural insights of the LMDI, an ordinary least squares (OLS) regression model has been developed in an attempt to identify the determinants of CO2 emissions. This model assesses the strength and direction of relationships between green energy indicators, such as security, innovation, and fossil fuel reduction, and broader environmental outcomes. The majority of extant empirical studies on Lithuania's energy sector were confined to data that ended in 2009. This study extends the analysis significantly by utilising annual data from 1995–2023 for LMDI decomposition. The regression analysis was conducted using quarterly data from 2010 Q1 to 2024 Q3. In order to guarantee the highest attainable level of

statistical integrity, the methodology incorporates a rigorous battery of diagnostic tests. The augmented Dickey–Fuller (ADF) test was employed to ascertain stationarity, whilst the Breusch–Pagan test was used to identify heteroscedasticity. Finally, the Shapiro–Wilk test was implemented to evaluate the normality of the residuals.

Main Findings and Contribution

The empirical results offer a nuanced perspective on Lithuania's energy trajectory. LMDI analysis shows that robust economic growth continues to push energy demand upwards, but the intensity effect, driven by significant improvements in energy efficiency, has been the main mitigating factor. The structural effect reveals a gradual shift towards less energy-intensive sectors. The empirical results provide a nuanced perspective on Lithuania's energy trajectory. LMDI analysis demonstrates that sustained robust economic growth continues to propel increasing energy demand; however, the intensity effect, driven by substantial advancements in energy efficiency, has emerged as the predominant mitigating factor. The structural effect demonstrates a gradual shift towards less energy-intensive sectors. Furthermore, the OLS regression analysis corroborates the notion that renewable energy production is a statistically significant driver of decarbonisation, with a negative coefficient ($\beta = -0.065$, $p = 0.025$). While Foreign Direct Investment (FDI) is also statistically significant ($\beta = -0.164$, $p < 0.001$), the relatively small magnitude of its coefficient suggests a limited quantitative impact, indicating a secondary rather than decisive role. Conversely, market price signals exhibit a substantially more pronounced efficiency-enhancing effect (energy price index: $\beta = -0.386$, $p < 0.001$), thereby emphasising their pivotal role in incentivising emissions reductions. Nevertheless, the study concludes that, despite the adoption of 'green' principles, their impact is not yet significant enough to fully decouple economic growth from emissions.

Originality and Value

This research provides a pioneering, dual-layer, empirical assessment of the Lithuanian energy sector. The study offers policymakers a comprehensive diagnostic tool by distinguishing between long-term structural evolutions (via LMDI) and short-term causal drivers (via regression analysis). The study's unique value lies in its identification of 'untapped potential' in market integration and innovation. It seeks to demonstrate how the work under discussion successfully bridges the so-called "gap" between the theoretical principles of green thinking and the practical "bottlenecks" faced by a developing market. It is argued that the work under

discussion offers a clear roadmap for directing public and private capital to maximize both environmental and economic returns.

Research Limitations

The findings are currently limited by the use of aggregate national-level data, which may hide variations specific to certain sectors (e.g. the transport sector's slower transition compared to industry). Furthermore, the relatively recent adoption of certain EU Green Deal policies means that the long-term structural shifts predicted by the model are still in their early stages of manifestation.

Theoretical and Practical Implications

The adoption of green energy principles in Lithuania signifies a multifaceted transition encompassing decarbonisation, efficiency, innovation, and energy security. The transition is constituted by institutional restructuring that enhances energy sovereignty. LMDI results confirm relative decoupling, while the emerging structural effect signals movement towards an "Electricity Economy", consistent with Sustainability Transitions Theory. The findings of the regression analysis provide substantiation for the roles of renewables, price signals, and FDI, thereby validating the Pollution Halo mechanism and indicating active green technology transfer.

In practice, the combined LMDI-regression framework facilitates precise differentiation between structural and short-term decarbonisation effects, thereby informing Lithuania's strategic energy planning. The results of the study identify domains of efficiency that are not performing well and guide targeted investment in sectors such as transport and buildings, while refining support for offshore wind and green hydrogen. The study's findings contribute to the enhancement of the European Green Deal's implementation by offering insights into the policy implications for CO_2 emissions. The research further supports the balanced management of sustainability, competitiveness, and affordability, a principle that aligns with the Continental European Network.

For future research, the following recommendations are made: firstly, LMDI analysis is to be applied on a sectoral basis in order to identify unique drivers in transport and agriculture; secondly, dynamic panel models are to be utilised for the purpose of making cross-country comparisons; and thirdly, quantile regression is to be implemented in order to understand the performance of green principles during different economic cycles or emission intensity levels.

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IMPROVING SAVINGS THROUGH VISUAL FRAMING: EXPERIMENTAL INSIGHTS ON GOAL PERSONALISATION AND FLEXIBILITY

Georgiou, Victoria[1]; Themistocleous, Christos[1]

[1]Department of Communication and Marketing, Cyprus University of Technology, Limassol, Cyprus

Keywords: Experiment, Financial Goals, Saving Goals

Background

While many people are aware of the benefits of saving, inadequate saving habits remain a crucial problem for individuals and the global economy (Bialowolski et al.,2024) while insights converge on the Present Bias as the main force that hinders saving behaviour for individuals who can save, but don't.

In this paper, we triangulate these insights with Goal-Setting Theory (Locke and Latham,2002) and its specific tenet of Goal Specificity. Well-specified goals provide greater motivation than generic, do-your-best goals that lack an external referent. We identify a research gap, within the context of saving behaviour, that relates to the motivational effects of goals that are well-defined but are either self-set (internally motivated) or set by an external entity (externally motivated). Formally, our first research question is:

RQ1: *Are people who set specific goals on their own, more motivated to save money than those who are given a specific, pre-set goal?*

Another tenet of goal-setting theory relates to the level of flexibility offered during goal pursuit. A pertinent insight refers to the *What-the-Hell-Effect* where individuals who are failing to meet certain goals may experience strong demotivation and thus abandonment of effort. To examine ways of mitigation, the experiment allowed for flexibility in the goal pursuit to enforce a "get-back-on-track" behaviour without feeling failure or disappointment on saving attempts. Consequently, the second research question is:

RQ2: *Is the presence of flexibility in the pursuit of a saving goal more motivating than its absence?*

The value of this study lies in combining visual framing and goal-setting in the context of personalisation and flexibility of saving goals.

Methods

Design

The study employs a 2×2 full factorial between-subjects experiment that lasted 14 days, and manipulated two key factors: Goal Personalisation (Pre-fixed vs Personalised) and Flexibility (Rigid vs Flexible), with a pre-test and a post-test questionnaire.

Sample

The sample consisted of 58 adults aged 18-29 years. Participants were regular consumers of ready-made coffee and expressed an interest in improving their saving habits. 15 participants were assigned to Groups 1 and 3 respectively, and 14 participants were assigned to Group 2 and 4, respectively. As the targeted behaviour was the reduction of coffee spending, participants were required to consume at least five ready-made coffees per week in recent months, while having the alternative to make their own coffee at home.

Process

The first group received a simple journal with 14 rigid circles (one for each day) and a pre-set goal of €50, colouring the corresponding circle if they saved the money. A picture displaying the monetary goal was shown in the journal. The second group had exactly the same journal as the first, with the only difference being that they had three "flex days" where they could buy coffee as usual. The goal was adjusted to adhere to the two-week period of the experiment and was thus reduced to €40 to account for the flex days. The third group received a personalised journal based on a product or service they chose at around €50 (i.e. handbag). A picture of their desired product was displayed in the journal. Finally, the fourth group was identical to the third, except there were 3 flex days, so the product or service they set to acquire was around €40.

Findings and Discussions

Results show the reduction of ready-made coffee purchases across all four groups over the 14-day period. Between-group analyses indicated a significant difference in percentage coffee reduction (H=8.940, p=.030), with the personalised and flexible condition (Group 4) demonstrating the highest mean rank (MR=38.36). Significant differences were also observed in the frequency with which participants thought about the financial benefits of saving (H=10.660, p=.014). Pairwise comparisons revealed that the personalised and rigid condition (Group 3) scored significantly higher than the group with a pre-fixed goal and flexibility (Group 2) (p=.007).

Findings suggest that small, structured saving goals can promote saving behaviour. Interestingly, while significant improvements were observed within all groups, only limited between-group differences were observed, suggesting that the goal-setting component of the intervention itself may have played a more important role than the specific experimental condition assigned.

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EXPLORING DISCLOSURE PRACTICES: KEY PERFORMANCE INDICATORS IN SAAS FINANCIAL REPORTING

Domat, Carina [1]; Kraus, Patrick [1]

[1]Business School, Pforzheim University, Pforzheim, Germany

Keywords: Software-as-a-Service, SaaS, Software Industry, Financial Reporting, KPIs

Abstract

Software-as-a-Service (SaaS) is driving a fundamental shift in the software industry through cloud-based access and subscription-based business models. Unlike traditional software vendors, SaaS companies operate in a recurring revenue model that emphasizes long-term customer relationships and continuous value delivery. Consequently, their performance cannot be fully captured through conventional financial metrics. Key performance indicators (KPIs) tailored to the SaaS business model hence play a central role in management. The primary objective of this research is to investigate the disclosure practices of KPIs within the context of financial reporting of US and German software companies. The study analyses how SaaS KPIs are embedded within the broader financial reporting context using a qualitative thematic coding approach.

This study contributes to the understanding how SaaS-specific KPIs are reported in external financial communication. From both an investor and regulatory perspective, the quality of these disclosures is crucial for informed decision-making. Moreover, as SaaS companies operate globally and face different regulatory environments as well as investor expectations, their approaches to KPI disclosure may vary considerably.

Introduction

Software-as-a-Service (SaaS) is driving a fundamental shift in the software industry through cloud-based access and subscription-based business models. Users can access software over the internet, while service providers manage the infrastructure, maintenance, and updates. This may significantly reduce costs and enables scalable, usage-based pricing (Wirtz, 2024). Unlike traditional software vendors, SaaS companies operate in a recurring revenue model that emphasizes long-term customer relationships and continuous value delivery. This structural difference

fundamentally alters how performance is generated and evaluated. As a result, conventional financial metrics provide a limited view of the key value drivers behind SaaS operations. This shift has significant implications for financial and operational controlling, demanding flexible, forward-looking tools and practices (Thaler and Pierer Von Esch, 2020). Key performance indicators (KPIs) tailored to the SaaS business model now play a central role in management.

Given the growing importance of performance measurement in the SaaS sector, it is essential to understand how companies present relevant information in their external financial reporting. Annual reports increasingly combine traditional accounting figures with non-GAAP metrics, raising concerns about consistency, transparency, and comparability. From both investor and regulatory perspectives, the quality of these disclosures is crucial for supporting informed decision-making (Lessambo, 2022). The primary objective of this study is to investigate KPI disclosure practices within the context of SaaS financial reporting. As these firms increasingly rely on non-GAAP metrics to communicate business performance, there is a growing need to understand not only which indicators are disclosed but also how they are defined, calculated, and integrated into the broader performance narrative. The overarching aim is to provide a structured assessment of current SaaS KPI reporting practices and to evaluate their effectiveness in promoting comparability and supporting stakeholder understanding.

The paper is structured as follows: the subsequent section provides a brief literature review discussing relevant themes specific to the SaaS context. We then present the research design, which is followed by presenting and discussing the empirical findings. The main findings and implications are then summarized by a conclusion.

Literature Review on SaaS KPI Reporting

SaaS performance metrics

The selection and application of performance metrics are crucial for evaluating growth, efficiency, and value. Recent studies and industry benchmarks consistently identify a core set of metrics that capture the recurring nature of SaaS operations. Among the most prominent metrics are Annual Recuring Revenue (ARR) and Net Dollar Retention (NDR), which serve as indicators of revenue predictability and customer value development. A study conducted by Gupta et al. (2022) as part of Deloitte's financial benchmarking of enterprise SaaS firms shows that NDR functions as a key leading indicator of long-term growth. According to the authors, NDR cap-

tures the revenue dynamics within the existing customer base and is directly linked to ARR growth through its components: expansion, contraction, and churn. The higher the NDR, the faster ARR tends to grow. Firms with NDR rates above 120 per cent reportedly experience significantly stronger revenue growth. According to Deloitte's analysis, increasing NDR from 120 per cent to 160 per cent can more than double a company's revenue within three years (Gupta et al., 2022). These findings are supported by McKinsey analyses conducted by Roche and Tandon (2021) as well as Barsamian (2021), which describe NDR as essential to enterprise valuation and a common benchmark used by investors. Brun et al. (2024) further confirm this relationship through benchmarking data from Norwegian business-to-business (B2B) SaaS firms, illustrating NDR as a consistent driver of sustained revenue growth. Beyond financial metrics, customer-centric KPIs have gained increasing relevance in managing SaaS business models, reflecting a broader shift toward more comprehensive KPI reporting. One illustrative example is Bosch, which developed a practical framework tailored to digital business models. In addition to Monthly Recuring Revenue (MRR), this framework includes Conversion Rate, Customer Acquisition Cost (CAC), and Customer Lifetime Value (CLTV), each aligned with different phases of the SaaS lifecycle (Nasca, 2019).

Strategic drivers of disclosure

Empirical research shows that both internal motivations and external influences play a central role in shaping the scope and quality of non-GAAP reporting. The following synthesis highlights how SaaS firms use KPI disclosure as a tool for investor communication and strategic positioning. Boesso and Kumar (2007) demonstrate that internal company characteristics are key drivers of voluntary disclosure volume. In their comparative content analysis of 72 corporate reports from Italy and the United States, they find that company size, business complexity, and stakeholder orientation significantly influence the amount of disclosed information. The strategic use of KPIs as a communication tool is highlighted by Krasodomska and Zarzycka (2021), who demonstrate that KPI disclosure often serves as a signaling mechanism to build investor trust. Their regression-based study shows that companies facing higher capital market pressure tend to report more KPIs, often with the implicit goal of signaling financial health and forward-looking confidence. In this context, KPIs are carefully selected and framed to influence investor perception and strengthen market credibility. This perspective is especially relevant for SaaS companies, which often use ARR or NDR to communicate potential for future growth rather than short-term profitability. The findings imply that KPI disclosure in the SaaS sector

frequently serves a strategic purpose by aligning reported metrics with investor expectations and growth narratives. Cho and Kim (2021) investigate how voluntary disclosures influence stock liquidity outcomes. In their analysis of a large sample of 8-K filings by U.S. firms, they find that positive disclosures have a disproportionately strong impact on liquidity compared to negative ones. This asymmetry is linked to short-selling constraints, estimation risk, and differences in interpretability.

Quality and consistency of disclosure

Although identifying appropriate KPIs is crucial for effective performance communication, their impact ultimately depends on the clarity and consistency of their presentation. While these disclosures are intended to enhance transparency and foster better stakeholder understanding, empirical research reveals substantial variation in the quality of these practices. Black et al. (2017) provide evidence that non-GAAP reporting has increased significantly in recent years and is now widely used across all industries. However, concerns remain regarding the comparability and consistency of these disclosures, as companies frequently vary their non-GAAP calculations. These findings suggest that the mere presence of KPIs does not ensure informative value, unless properly defined and explained. Supporting this conclusion, Zarzycka and Krasodomska (2022) capture that high disclosure volume is not always correlated with greater transparency. In fact, companies often report many indicators without providing sufficient definitional clarity or strategic commentary. Consequently, even widely adopted SaaS metrics risk losing their decision-usefulness for investors and other stakeholders. However, firms that operate in highly regulated or capital market-oriented industries tend to provide more contextualized information.

Smith and Van Der Heijden (2017) provide evidence of how financial analysts engage with company-reported metrics. Based on a series of expert interviews, their study reveals that inconsistently defined KPIs pose a recurrent challenge for meaningful cross-company comparisons. Analysts frequently recalculate these metrics using internal models to reconstruct comparability. Black et al. (2021) show that most firms are internally consistent in calculating non-GAAP figures, significant differences remain across firms and sectors. Notably, their findings indicate that, on average, deviations from standard non-GAAP reporting practices can enhance the informativeness of earnings figures by better reflecting firms' core operational performance. However, the potential for increased informational value depends on the consistency and trans-

parency with which these metrics are applied. This supports the view that customized KPIs commonly used in SaaS reporting can be valuable tools for communicating performance, provided they are clearly explained, logically derived, and consistently used over time. Adding on this, Dechow et al. (2025) develop a quantitative rating system to assess the quality of individual non-GAAP exclusions. They conclude that low-quality disclosures reduce interpretability and are associated with increased SEC scrutiny, greater analyst forecast variation, and slower assimilation of earnings information by the market. Importantly, their findings prove that, despite notable cross-industry differences in disclosure quality, most firms apply their exclusions consistently over time. According to the authors, this criterion is regarded as a key indicator of disclosure quality. Although both Black et al. (2021) and Dechow et al. (2025) primarily focus on non-GAAP earnings adjustments, their approaches to evaluating disclosure quality are highly relevant beyond that narrow scope. In the context of SaaS firms, where key metrics fall outside formal accounting standards, these findings underscore the value of structured qualitative criteria when assessing the transparency and informativeness of voluntary disclosures.

Taken together, the literature indicates that both internal and external factors influence the disclosure of SaaS KPIs. This suggests that tailoring metrics to firm-specific contexts can enhance strategic relevance as well as communicative effectiveness. However, this level of flexibility requires clear definitions and contextualization to ensure decision usefulness. Table 1 consolidates the key findings by summarizing the most frequently cited criteria for evaluating KPI disclosure practices.

Criteria	**Description**	**Sources**
Clarity of Definitions	Are KPIs clearly defined with comprehensible terminology and calculation methods?	Zarzycka and Krasodomska (2022), Black et al. (2017)
Transparency of Disclosure	Are KPIs explained and justified in sufficient detail?	Black et al. (2017, 2021), Dechow et al. (2025)
Contextual Framing	Are KPIs embedded in a strategic or narrative context?	Smith and Van Der Heijden (2017), Black et al. (2017), Boesso and Kumar (2007)
Stakeholder Orientation	Do the KPIs reflect the information needs of external stakeholders?	Krasodomska and Zarzycka (2021), Nyahas et al. (2018), Boesso and Kumar (2007)

Consistency Over Time	Are KPIs presented consistently across periods?	Black et al. (2021), Dechow et al. (2025)
Comparability Across Firms	Do the KPIs allow benchmarking by aligning with industry standards?	Zarzycka and Krasodomska (2022), Smith and Van Der Heijden (2017), Black et al. (2021)

Table 1: Criteria for Evaluating KPI Disclosures (created by the authors)

Research Design and Method

This study employs a qualitative research design to investigate the disclosure of KPIs in SaaS financial reporting. A qualitative approach was selected due to its flexibility and ability to capture both the content and context of disclosure practices. Given the limited regulatory guidance on non-GAAP disclosures specific to SaaS business models, a qualitative methodology provides the necessary analytical depth to explore firm-level communication strategies and interpretive nuances. The study uses qualitative thematic analysis. This method is particularly suited for the systematic evaluation of text-based data and enables the identification of both explicit content (e.g., KPI definitions and calculation methods) and implicit dimensions such as narrative framing and strategic positioning. The empirical basis of this study consists of secondary data in the form of publicly available annual reports issued by listed SaaS companies. Annual reports serve as key instruments through which companies report financial performance and strategic direction to external stakeholders. These documents often combine quantitative elements, including tables and charts, with qualitative components, particularly management commentary, strategic outlooks, and explanatory narratives. A purposive sampling strategy was applied, whereby companies were deliberately selected based on their potential to provide relevant and diverse insights into SaaS-specific KPI disclosures. Purposive sampling allows for the intentional inclusion of cases that are particularly informative and theoretically meaningful (Kuckartz, 2014).

This study focuses on publicly listed German and U.S. software companies operating in the B2B SaaS segment. These two markets are considered among the most mature and globally influential in the SaaS sector. From an initial pool of twelve companies from the S&P 500 index (Information Technology) and TecDAX, eight were selected for analysis. Selection criteria included relevance to the B2B SaaS context, the availability and quality of annual reports, as well as the extent to which SaaS-specific information was disclosed. Annual reports of the fiscal

year 2024, which have been disclosed around mid 2025 have been used for the analysis. The final sample includes the companies SAP, TeamViewer, ATOSS Software, Nemetschek Group, Salesforce, Workday, Oracle, and ServiceNow. The sample ensures a balanced regional distribution, which allows potential comparisons between disclosure practices in different regulatory environments.

The data analysis is conducted using template analysis and is supported by the qualitative data analysis software ATLAS.ti, which enables systematic coding, retrieval, and comparison of text segments across documents. Following the approach outlined by King (2004), a coding template is developed and refined iteratively throughout the analysis. An initial set of themes is inductively derived from a subset of reports and guided by the research questions. The coding structure is hierarchically organized into higher-order themes, subthemes, and individual codes. Key to this process is the iterative refinement of the template, in which codes are continuously evaluated and adjusted based on empirical observations. For instance, the code "Recurring Revenue" captures various expressions of recurring income streams, including ARR, MRR, and general references to subscription or SaaS revenue. The final coding scheme is provided in Table 2. Given the scope of the paper, solely the constructs 1 and 4 will be discussed here.

	Construct (**Theme**/*Subtheme*)	**Code**
1	**Types of reported SaaS KPIs**	
	Revenue Metrics	Recurring Revenue, Cloud Revenue, Revenue Retention, Remaining Performance Obligation
	Customer Metrics	Churn Rate, Net Promoter Score, Renewal Rate, Number of Subscribers
	Efficiency Metrics	Billings, Contract Value, Rule of 40
2	**Initial Presentation of KPIs**	
	Accounting Framework	Non-GAAP Disclosure, Revenue Recognition
	Terminology & Measurement	Labelling, Definition, Calculation Method
3	**Transparency of KPI Disclosures**	
	Interpretation and Critical Reflection	Interpretation, Limitations, Influencing Factors
	Disclosure Consistency	Narrative-Quantitative Gap, Inconsistent Terminology

4	**Contextualization of KPIs**	
	Comparative Framing	Historical Comparison, Forecasting, Benchmarking
	Strategic Framing	Management Commentary, Strategy Alignment, Investor Relevance, Risk Integration

Table 2: Final Coding Scheme (created by the authors)

Findings and Discussion

Types of reported SaaS KPIs

Revenue-related KPIs serve as the core of performance reporting in SaaS companies and represent the most comprehensively covered category across the analyzed sample. All eight companies disclose revenue indicators that reflect the recurring nature of their business model, highlighting the central role of SaaS-specific KPIs in communicating financial stability and long-term value creation. Among these, Subscription Revenue, Cloud Revenue, ARR, and RPO are most prominently reported. Their widespread use highlights a shared understanding of their relevance in conveying the predictability and sustainability of SaaS business models. At the center of this group is subscription revenue, which is disclosed by all companies across the sample, either as a standalone figure or in combination with broader cloud revenue. Notably, US-based companies report subscription revenue separately, while German firms tend to aggregate it with other cloud-related income. These broader disclosures often include components such as maintenance and support revenue, which are contractually linked to software usage but may not be part of the core subscription model. While this practice may reflect differences in internal accounting practices, it can reduce transparency by blurring the distinction between recurring and non-recurring revenue.

Similarly, several companies report ARR as a separate figure to provide a more standardized and forward-looking perspective on revenue generated from active subscriptions. ARR is frequently used to signal business momentum, particularly in investor communications and strategic planning contexts. In some cases, ARR is further elaborated through supplementary disclosures, namely ARR growth rates or currency-adjusted ARR, which enhance transparency and provide more detailed insight into recurring revenue dynamics. Like that the literature identifies subscription revenue, alongside ARR and MRR, as a fundamental indicator of financial stability and long-term viability in subscription-based business models (Ebert and Schmid,

2024; Momsen, 2019). By contrast, MRR is disclosed far less frequently. Other commonly reported metrics in this category are RPO and Cloud Backlog. These figures provide important forward-looking information and help assess the predictability of future revenue streams. While U.S. companies tend to report RPO, German companies more frequently use backlog figures, including cloud order backlog or simply cloud backlog.

Customer-related KPIs represent the second major category of SaaS-specific performance indicators. While they are not universally reported across all companies in the sample, most firms (Salesforce, ATOSS, SAP, ServiceNow, TeamViewer) include at least one metric in this area. This reflects a growing awareness of the strategic relevance of customer retention, satisfaction, and engagement within subscription-based business models. Among the most frequently disclosed metrics in this category are churn rate and the NPS. Only a few (TeamViewer: number of customers; ServiceNow: number of customers with ACV greater 1 million USD, renewal rate) companies in the sample disclose further customer metrics, including the renewal rate or the number of subscribers. Their limited presence suggests that customer-related indicators have not yet been systematically integrated into corporate reporting. Compared to revenue metrics, customer KPIs exhibit greater variation in both frequency and format. Furthermore, no clear pattern emerges based on region or company size, as only a few firms report multiple customer-related indicators, while others omit them entirely. This inconsistency may result from differences in internal data availability, analytic capabilities, and the degree to which companies prioritize qualitative aspects in their external communication. Customer-related KPIs can be considered essential for measuring performance in SaaS business models, primarily due to their strong association with long-term value creation and risk management (Momsen, 2019). The observed reporting practices, however, show a clear gap between recommendations in literature and actual disclosure behavior. For instance, while academic literature frequently highlights CLTV as essential for evaluating customer profitability (Seidenstricker et al., 2025), it is largely absent from the analyzed sample. This indicates that performance measurement in practice remains focused on financial results, whereas customer dynamics, despite their strategic relevance, are often underrepresented in external reporting.

Efficiency-related KPIs form the third major category. These indicators aim to assess how effectively a company converts operational activity into sustainable growth and profitability, thereby reflecting the scalability of the business model. Efficiency metrics focus on structural

performance factors. These include how effectively a company translates operational activity into revenue, manages pricing models, and scales its cost base relative to growth. The distinction between these categories is not always clear-cut. Some indicators, such as Annual Contract Value (ACV), could also be interpreted through a customer lens. However, for the purpose of this analysis, these metrics are classified as efficiency KPIs when they primarily serve to evaluate monetization potential, pricing structures, or cost-value relationships on a strategic level. Depending on how they are framed, these indicators may serve as leading or hybrid indicators, providing early signals of commercial performance and future revenue capacity.

Within the sample, efficiency and operational metrics are disclosed infrequently. The few identified KPIs include ACV, Billings, and the Rule of 40. ACV captures the average or total value of customer contracts over a one-year period and provides insights into pricing strategy as well as sales effectiveness. Billings refer to invoiced amounts within a reporting period and may indicate short-term cash flow dynamics. In one instance, Billings are further disaggregated into Retained Billings, New Billings, and Non-recurring Billings (TeamViewer, 2024). Lastly, the Rule of 40 combines a company's revenue growth with its profit margin into a single benchmark, reflecting a balanced approach to scalable and sustainable growth. These metrics appear only in isolated cases (TeamViewer: Billings, ACV; ServiceNow: Rule of 40, ACV) and are not systematically applied across the sample. Furthermore, no regional pattern can be observed, as reporting frequency remains generally limited regardless of company characteristics. These findings align only partially with the literature. Several studies underscore the relevance of customer- and efficiency-focused metrics for steering operational decisions, identifying risks early on, and assessing long-term company value (Nasca, 2019; Ottens and Wahrlich, 2022). Suggested frameworks often refer to CLTV, CAC, and Conversion Rates as necessary complements to traditional financial indicators (Brun et al., 2024; Roche and Tandon, 2021).

The selective and inconsistent disclosure of customer and efficiency metrics indicates significant problems. While revenue metrics provide a common basis for evaluating financial performance, they offer only a partial view of the key drivers of success in subscription-based business models. The lack of transparency into customer-related outcomes and operational scalability reduces the explanatory power of financial statements. Moreover, the absence of standardized and comparable metrics complicates peer analysis, which are particularly important in the dynamic and growth-oriented SaaS environment. These findings challenge the conclusions

of Boesso and Kumar (2007), who argue that internal structural characteristics, particularly firm size and business complexity, are drivers of voluntary disclosure volume. In the present sample, Oracle, one of the largest companies analyzed, reports the fewest SaaS-specific KPIs, while ATOSS, a comparatively small provider, offers one of the most comprehensive disclosure sets.

Contextualization of KPIs

The analysis of comparative framing in KPI disclosures captures that many SaaS companies aim to enhance the interpretability of performance metrics by embedding them in internal or external reference frameworks. Across the sample, three main approaches can be identified: (i) historical comparisons, (ii) forecasting, and (iii) benchmarking. These elements are used to situate KPIs within a broader narrative and reinforce their strategic significance. As noted by Krasodomska and Zarzycka (2021), framing strengthens the signaling function of KPIs in communicating future-oriented performance and operational credibility.

Firstly, (i) historical comparisons represent the most widespread method of contextualizing KPIs. Many firms report key metrics using year-over-year (YoY) or quarter-over-quarter (QoQ) comparisons to indicate growth dynamics and reinforce perceived performance continuity. Salesforce, for instance, highlights a 17 per cent increase in its RPO compared to the previous year, signaling sustained customer demand and strengthening expectations of future revenue. For stakeholders, these comparisons enhance the transparency and credibility of KPI disclosures, as they highlight not only short-term momentum but also the longer-term direction of company performance. QoQ comparisons are less common across the sample, as these figures are typically reported in separate quarterly updates for investors. While most companies limit their comparisons to the current and prior year, German companies tend to adopt a more extended perspective in their framing. ATOSS, for instance, tracks the increase in its share of recurring revenue and explicitly presents this trend as evidence of a successful structural transformation:

> "While in 2015, 38% of our total revenue came from recurring revenue streams, this figure had increased to 46% by 2020 and has now reached 65% by 2024. […] This excellently reflects our strategy to ensure high-quality, long-term income and underlines the sustainability and profitability of our business model."
> (ATOSS, 2024 p. 47)

This long-term view reinforces the company's strategic narrative and signals the stability and maturity of its business model. Similarly, SAP and Nemetschek provide five-year comparisons of selected KPI metrics, offering stakeholders a broader view of performance evolution. While the literature does not explicitly focus on time-based comparisons as a distinct framing technique, related concepts such as the importance of consistency over time (Black et al., 2021) and contextual explanation (Smith and Van Der Heijden, 2017) point to their relevance.

Several firms integrate (ii) forecasting elements into their KPI communication. Forward-looking statements and targets serve not only to articulate strategic ambition but also to influence investor expectations. German companies, particularly SAP and Nemetschek, provide explicit medium-term goals for KPIs. SAP, for example, forecasts cloud revenue between €21.6 billion and €21.9 billion in 2025, corresponding to 26-28 per cent growth. These goals are typically aligned with strategic frameworks, reinforcing the company's long-term vision. U.S. firms, in contrast, are more cautious in their use of numerical forecasts and often restrict forward-looking disclosures to revenue outlooks or broad segment expectations. A similar pattern can be observed with (iii) benchmarking practices, which appear only rarely. When used, these comparisons are often qualitative and serve to signal market leadership rather than provide systematic peer analysis. Firms may emphasize their position through claims of industry-leading growth or customer metrics, even without disclosing specific benchmarks. For example, SAP asserts that none of its major competitors achieved comparable cloud growth. Similarly, ATOSS highlights a 1.6 per cent churn rate as "one of the best in the sector" (ATOSS, 2024, p. 55). While these references enhance perceived performance, they typically lack detailed comparative data.

Overall, while both U.S. and German companies use comparative framing to enhance KPI disclosures, notable differences emerge in scope and emphasis. U.S. firms focus more on short-term growth and market-oriented framing, suggesting a stronger orientation toward investor signaling. In contrast, German companies apply longer-term comparisons, reflecting a broader stakeholder approach. These differences support the findings of Boesso and Kumar (2007) as well as Krasodomska and Zarzycka (2021) and Zarzycka and Krasodomska (2022), who emphasize that disclosure quality is influenced by strategic intent. The observation further demonstrates that disclosure practices are shaped not only by regulatory frameworks but also by underlying assumptions regarding the purpose of performance communication. The generally

larger size and higher market exposure of U.S. firms likely reinforce this signaling orientation, as both competition and investor scrutiny tend to increase with organizational scale.

Finally, it can be explored how SaaS KPIs are strategically framed to align with broader narratives of transformation, value creation, and stakeholder engagement. A common instrument is management commentary, where executives explicitly emphasize the strategic importance of selected KPIs. Statements from executive board members or CEOs frequently highlight ARR, NRR, or Churn Rate. Table 3 presents illustrative examples from ATOSS and SAP, both of which use customer and revenue-based indicators to link financial performance to long-term business stability.

SAP (2024, p. 7)	**ATOSS (2024, p. 55)**
"Total cloud backlog […] is 40% higher than in the previous year […] and with a share of recurring revenues now accounting for 83% of our total revenue, we have very solid future prospects."	"Customers don't just stay with ATOSS - they grow with us, as our strong net revenue retention rate.

Table 3: Management Commentary on SaaS KPIs (created by the authors)

Building on this, the strategic alignment of KPIs is often closely tied to management commentary. Executives use narrative framing to position performance indicators within broader corporate objectives and transformation incentives. Rather than presenting metrics in isolation, companies link them to overarching themes, including customer loyalty, recurring revenue growth, and sustainable business development. Particularly, NRR, Churn Rate, and NPS are referenced as key indicators of progress toward these strategic goals (ATOSS, 2024; SAP, 2024; Nemetschek, 2024). Notably, German companies tend to disclose more structured strategy-KPI linkages and concrete targets, while U.S. firms typically limit themselves to broader directional statements. It is also striking that ATOSS, despite being one of the smallest companies in the sample in terms of revenue, provides particularly transparent and well-structured contextual information. This reinforces that reporting depth is not strictly tied to company size but may reflect a deliberate commitment to communicative clarity and investor orientation. While the literature broadly affirms the role of voluntary disclosure in strategic communication and stakeholder alignment (Boesso and Kumar, 2007; Krasodomska and Zarzycka, 2021).

Another dimension of framing relates to investor relevance. ServiceNow explicitly justifies the disclosure of customer metrics in terms of their usefulness for investor decision-making. This reflects a broader trend among larger, U.S.-based firms to align KPI disclosure with capital market expectations and to strengthen investor confidence through targeted transparency. By linking operational metrics directly to perceived shareholder value, these firms reinforce the financial materiality of their KPIs. In contrast, German and smaller firms tend to emphasize operational relevance and internal steering logic, often presenting KPIs in the context of business model transformation or efficiency goals rather than investor signaling. These patterns align with the findings of Nyahas et al. (2018), who argue that firms adapt disclosure based on the perceived power and urgency of stakeholder groups, placing greater emphasis on investors where capital dependency and visibility are high.

Conclusion

The analysis reveals that SaaS companies predominantly emphasize revenue-related KPIs in their financial reporting. These indicators are generally well defined and often embedded in broader performance narratives, reflecting their strategic relevance for capital market communication. In contrast, customer- and efficiency-related KPIs are less frequently reported and often lack clear definitions as well as contextual framing. These patterns suggest a gap between recommended performance measures by literature and actual industry practices. The degree to which metrics are embedded in coherent narratives and linked to strategic objectives differs considerably. U.S. companies tend to apply more standardized formats, align more closely with regulatory expectations, and offer more consistent contextual and strategic framing. In contrast, German firms often present aggregated disclosures and apply qualitative framing only selectively. These patterns suggest that disclosure practices are shaped by a combination of structural influences and firm-specific communication strategies. Ultimately, cross-company comparability is limited.

For practitioners, the study emphasizes the importance of linking internal performance management with clear and consistent external reporting. Transparent definitions, methodological clarity, and purposeful framing are key to improving comparability and building stakeholder trust. High-quality reporting is not exclusive to large firms, as smaller companies can also demonstrate credibility through clarity and coherence. As every research this study is subject to several limitations. First, the analysis draws exclusively on secondary data from publicly

available annual reports, which restricts insights into the internal decision-making and strategic motivations behind KPI disclosure. It remains largely unclear to what extent the reported metrics are used for management purposes or whether additional KPIs are tracked but not disclosed. The sample is restricted to US and German software firms. Future research could use qualitative interviews with internal stakeholders, to offer a deeper understanding of the strategic and operational rationale behind KPI disclosures.

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DOES GREENWASHING MATTERS FOR CHINESE BANK'S PERFORMANCE: THE ROLE OF GENDER DIVERSITY

Muhammad Ishfaq Ahmad[1], Ramiz Ur Rehman[1], Muhammad Akram Naseem[2], Joe Ueng[3], Niccolò *Nirino*[4]

[1]Teesside International Business School, Teesside University, Middlesbrough, UK

[2]Lahore Business School, The University of Lahore, Lahore, Pakistan

[3]Cameron School of Business, S.T Thomson University Houston, Texas, United States

[4]Department of Management, University of Turin, Turin, Italy

Keywords*:* Green-washing, Gender Diversity, Chinese Banks, Return on Assets, Return on Equity, Board Size, Board Independence, Financial Leverage

Introduction: Banks are considered as the backbone of any economy and play very important role for the development of any economy; therefore, China does not have any exception. There is strong pressure on China internally and externally to manage the environment issues. To overcome this pressure many firms they started the word around ESG but to meet the expectations of all the stakeholders they started the greenwashing, and media exposed this firms' greenwashing behaviour.

Purpose Aims and Objectives: Following the legitimacy and upper echelon theories, the study examines the role of greenwashing and Chinese banking performance and weather presence of the females in the board moderates this relationship.

Literature Review and Theoretical Framework: Existing literature on ESG adopted different theoretical framework, however majority of the studies seems to explain the different variation in ESG disclosure through legitimacy theory and Upper echelon theory framework (Baldini et al., 2018). Legitimacy theory explains the organization social acceptance for its survival. Suchman (1995) defined legitimacy as "a generalized perception or assumption that the actions of any entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs and definitions".

The study test the following hypothesis

H1: Does greenwashing have any impact on the Banks performance.

H2: Females presence in the corporate board moderates the relationship between greenwashing and banks performance.

Methodology and Methods: To test the proposed hypothesis, the study used fixed effect regression across 46 Chinese banks including Big 4. The data is taken from Refinitiv from 2015-2024. The outcome variable is return on asset (ROA) and return on Equity (ROE). Both measures are widely used as the proxy of the bank's performance (Le et al., 2023).

We employed the following econometric model to measure the role of greenwashing on the banking performance

$$ROA_{it} = \alpha + \beta_1 Gw_{it} + \beta_2 BGD_{it} + \beta_3 (BS_{it} * GW_{it}) + \beta_4 BS_{it} + \beta_5 BI_{it} + \beta_6 DE_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

$$ROE_{it} = \alpha + \beta_1 Gw_{it} + \beta_2 BGD_{it} + \beta_3 (BS_{it} * GW_{it}) + \beta_4 BS_{it} + \beta_5 BI_{it} + \beta_6 DE_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where i stands for banks and t is for time. ROA is return on Assets, GW is greenwashing, BGD is board gender diversity, BS is board size, BI is board independence, DE is total debt to equity.

Findings: The study examined the impact of greenwashing on the banking financial performance which is unexplored in the existing literature of greenwashing (Birindelli et al.., 2024) as majority of the studies on the non-financial sector (Zahid et al., 2023). The results show that greenwashing is no longer beneficial for the firms as few studies reported the positive outcomes of greenwashing (Li et al., 2023). The latest developments in the China such as the establishment of Central environmental protection inspection (CPEI) policy created the awareness among the stakeholders (Zhao and Lee, 2024) and there is no economic benefit of the greenwashing.

Originality and Value: This study is unique and original in its nature. This is first study that consider the Chinese banking and studied the greenwashing phenomena in the banking sector. Chinese banks are the pioneer in launching the green bonds and big promoters and supporters of the green initiatives; therefore, the study expose the banking sector greenwashing.

Research Limitations: Despite all this, the study has few limitations which are the opportunities for the future research. First this study considered the only Chinese banks, further studies can consider the comparative studies sample from the developing countries. This study only considered the gender diversity of the board members future studies may consider other types of diversity such as education, age and experience. The further studies may consider the role of ownership by studying the state-owned banks and non-state-owned banks.

Theoretical and Practical Implications:

The study highlighted the role of females in the banking sector to minimize the greenwashing in the financial institutions. The study supports the upper echelon theory which considers the characteristics of the higher management in the decision making. Similar to other sectors, it confirms that higher management characteristics e.g gender (Zahid et al., 2023) matters in banking sector and plays critical role to control the greenwashing.

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COUNTERFACTUAL EXPLANATIONS FOR FINANCIAL ASSET RECOMMENDATION

Dr. Carvalho, Tânia[1]; Dr. Kordia, Ali[1]; Vamvakaris, Petros[2];

Dr. Syllignakis, Manolis[2]; Prof. Cordy, Maxime[1]; and Prof. Krasonikolakis, Ioannis[2]

[1]SnT, University of Luxembourg, LU

[2]National Bank of Greece, GR

Abstract

Financial asset recommendation (FAR) is a subdomain of recommender systems that identifies suitable financial securities for investors, with the expectation that they will invest capital in the recommended assets. Effective recommendation systems rely on modelling pricing data to distinguish between high-performing and potentially undervalued assets.

In this work, we use machine learning models to predict the future profitability of financial assets and rank them as investment recommendations. However, these models are inherently opaque, providing only a score without explaining why a particular asset was selected over others. This lack of transparency makes it difficult to assess whether the model's predictions are financially meaningful and not influenced by arbitrary patterns in the training data.

Preliminary results show that counterfactuals explanations were successfully generated for all assets in two of the 61 evaluation windows. The modest improvements in predicted profitability suggest that small changes to historical price patterns are often sufficient to improve recommendations while remaining close to the factual prices.

Keywords: Financial Asset Recommendations, Explainable Artificial Intelligence, Counterfactual Explanations, FinTech

Introduction

Explainable artificial intelligence not only improves transparency but can also transform recommendation systems into decision-support tools. In particular, counterfactual explanations

provide actionable insights by identifying the minimal changes required for an asset to become a more attractive investment under alternative market conditions.

Existing applications mainly focus on credit-related tasks using binary classifiers (Černevičienė & Kabašinskas, 2024). Attention has also shifted towards time-series counterfactuals, where preserving temporal coherence is essential to ensure realistic explanations (Delaney, et al., 2021; Wang, et al., 2024).

However, counterfactual explanations remain unexplored for regression-based FAR systems that derive profitability recommendations from historical price trajectories. We address this gap by providing actionable explanations and evaluating their stability over time using an expanding window approach.

Our goal is to provide analysts and investors with actionable insights into the models' recommendations by identifying minimal price changes that would lead to higher predicted profitability.

We evaluate our approach on two expanding evaluation windows. Counterfactuals were successfully generated for 97% of assets in both windows; at the level of individual asset-day queries, 81–82% yielded a valid counterfactual. For the remaining queries, 12–13% had no admissible counterfactual within our search bounds.

In practice, small counterfactual price changes indicate recommendations that are close to changing and may require monitoring, while the absence of a feasible counterfactual suggests a more robust recommendation. This differs from feature-attribution approaches (e.g., SHAP, LIME) commonly used in FAR.

Methodology and Methods

The proposed work extends the research by (Sanz-Cruzado, et al., 2026), who adopted an expanding window evaluation strategy to model FAR. Within each window, real historical price series are converted into financial indicators such as return and volatility measures over multiple time horizons. These indicators are then used by regression models to predict asset profitability and generate recommendation rankings.

Using the FAR-Trans datasets (Sanz-Cruzado, et al., 2024), we investigate counterfactual explanations for these profitability-based recommendations. Although the underlying models operate on financial indicators, counterfactuals are generated directly over the original 21-day

price windows to produce explanations that are more intuitive and actionable for analysts and investors. Starting from each asset's price history, we employ DiCE with a genetic algorithm (Mothilal, et al., 2026) to identify alternative price patterns that would increase the asset's predicted profitability while remaining consistent with its historical price behaviour. We then assess each counterfactual in terms of how much the predicted profitability improved, the number of price shifts, and how far the alternative trajectory deviated from the original.

Research limitations

Despite the promising results, this work presents a few limitations that motivate future research. First, the counterfactual objective is relatively simple, aiming only to exceed the factual profitability score while constraining the target by the asset's historical maximum profitability. While this avoids unrealistic objectives, it may restrict the search space for assets with consistently low returns.

A second limitation concerns the realism of the generated explanations. Although generated price patterns are constrained to remain within historical ranges, the optimisation process does not enforce temporal smoothness, potentially resulting in unrealistic fluctuations between consecutive observations.

Finally, the counterfactual generation is computationally demanding. Our approach relies on a genetic search which requires substantial resources, making analyses across all expanding windows challenging.

Conclusion and Expected Contributions

In this work, we investigate counterfactual explanations for profitability-based FAR by generating alternative historical price patterns that reveal the market conditions required to improve an asset's recommendation. These explanations have the potential to support more informed investment decisions. In summary, *i)* we provide counterfactualsdirectly on raw historical price data; *ii)* we perform a temporal analysis across expanding windows to study the stability of explanations under changing market conditions, including periods of high volatility; and *iii)* we identify which assets consistently have realistic and low-cost counterfactuals versus those for which no achievable alternative exists.

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THE STRATEGIC INTENT BEHIND AI-GENERATED ADVERTISING: A THEORY-DRIVEN EXPLORATION OF PERCEIVED CREATIVITY, HUMAN REPLACEMENT AND BRAND RESPONSES

Lejealle, Catherine [1] Rezaee Vessal, Saeedeh [2]; Jouny-Rivier, Elodie [3]

[1] Departement of marketing, ISC Paris, Paris, France
[2] De Vinci Higher Education, De Vinci Research Center, Paris, France
[3] Departement of Marketing, Essca, Angers, France

Keywords: Artificial intelligence, advertising effectiveness, strategic intent, bad buzz, consumer perception.

Introduction and purpose

The rapid diffusion of generative artificial intelligence (AI) in advertising is profoundly reshaping creative processes and brand-consumer relationships. While some AI campaigns receive praise, others provoke strong backlash and "bad buzz." This contrast suggests that consumer responses cannot be explained solely by intrinsic creative qualities. Moving beyond simple "human vs. machine" comparisons, this study explores a critical research gap: the shift from output-based evaluation to intent-based interpretation. We argue that consumer evaluations depend on *perceived strategic intent* — how audiences interpret a brand's underlying motives for adopting AI over human labor — viewed through the lens of reputational risk and strategic integrity.

Theoretical framework

In advertising, creativity is conceptualized as the joint presence of divergence and relevance (Smith et al., 2007). When creativity is delegated to machines, consumers shift their focus to the symbolic meaning of the brand's technological choice. To theorize these reactions, this research extends Situational Crisis Communication Theory (SCCT) (Coombs, 2017) to AI-

generated advertising, conceptualizing AI-induced "bad buzz" as a form of technology-induced reputational crisis driven by perceived corporate opportunism. This is complemented by consumer resistance and brand hate literatures, which highlight how value incongruence triggers negative behaviors (Hegner et al., 2017; Kucuk, 2008). We propose a distinction between two inferred dimensions:

1. *AI-for-efficiency:* AI is perceived as a cost-cutting tool substituting human creativity.
2. *AI-for-augmentation:* AI is seen as expanding creative possibilities while preserving human authorship.

Methodology

This study adopts a qualitative, theory-building approach based on semi-structured interviews with Generation Z consumers, selected for their technological literacy and ethical sensitivity. Participants will be exposed to contrasting AI-generated advertisements from the same brands (e.g., Coca-Cola's *Christmas* and *Masterpiece*). This comparative interpretative setup isolates how different AI applications (efficiency vs. augmentation) affect perceptions. Data will be processed using thematic coding focusing on strategic intent attribution, perceived human replacement, and affective brand responses.

Findings and contribution

Preliminary findings suggest that rejection emerges when AI use is interpreted as an efficiency-driven strategy aimed at reducing costs and bypassing human labor, triggering perceptions of opportunism and negative word-of-mouth. Conversely, when AI is perceived as augmenting human creativity, it reinforces brand innovativeness, legitimacy, and cultural relevance.

Originality, limitations and implications

The paper contributes by shifting the analysis of AI ads to consumers' interpretive processes, applying crisis theory to technological decisions, and formalizing the construct of strategic integrity. *Limitations:* Focusing exclusively on Gen Z limits generalizability to older cohorts. Additionally, qualitative data captures subjective interpretations rather than quantifiable

behavioral metrics. *Implications:* Theoretically, it shows that consumer response depends on inferred corporate motives rather than just aesthetic realism. Practically, it highlights that marketers must proactively frame AI as an augmentative tool and ensure absolute alignment between technological choices and ethical positioning.

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INTERNAL MARKETING AS A STRATEGIC MARKETING TOOL: LEVERAGING PERSONAL AND ORGANISATIONAL VALUES AND NON-FINANCIAL REWARDS TO FOSTER EMPLOYEE ENGAGEMENT

Kyriacou, Evdoxia[1]; Zarkada, Anna[2]; Papasolomou, Ioanna[3]

[1]CIIM Business School, University of Limassol, Limassol, Cyprus

[2] Department of Communication and Marketing, Cyprus University of Technology, Limassol, Cyprus

[3] School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Internal marketing, employee engagement, personal values, organisational values, Higher Education Institutions

Introduction

In the current VUCA environment, organisations increasingly need to direct marketing strategy internally as well as externally, as employee engagement (EE) can support sustainable competitive advantage (Ahmed and Rafiq, 2003; Kumar and Pansari, 2016). However, Internal Marketing (IM) remains conceptually ambiguous and inconsistently operationalised, limiting understanding of its strategic outcomes (Rafiq and Ahmed, 2000; Papasolomou et al., 2017; Kyriacou, 2024). This study therefore examines IM as a strategic, values-based system of non-financial rewards that strengthens EE through perceived organisational values while accounting for employees' personal values.

Purpose, Aim and Objectives

The purpose of this study is to examine IM as a strategic, values-based non-financial reward system that fosters EE. Specifically, it investigates the direct and indirect relationships between PIM and EE by assessing the mediating role of perceived organisational values and the moderating influence of employees' personal values.

Literature Review and Theoretical Framework

Building on evidence highlighting the fragmented conceptualisation and operationalisation of IM (Papasolomou et al., 2017; Kyriacou, 2024; Brown et al., 2025), this study conceptualises IM as a strategic organisational capability integrating internal communication, organisational culture and non-financial reward practices. Drawing on the relational perspective of IM

(Ahmed and Rafiq, 2003; Ballantyne, 2003; Lings and Greenley, 2005), the proposed framework suggests that perceived IM strengthens EE through perceived organisational values, while employees' personal values moderate these relationships.

Methodology

This paper reports the quantitative phase of a sequential mixed-methods study. Data (n = 415) were collected using a census survey of employees across Higher Education Institutions (HEIs) in an EU country. The proposed conceptual model was tested using moderated mediation analysis.

Main Findings and Contribution

The findings provide empirical support for the conceptualisation of Perceived Internal Marketing (PIM) as a coherent strategic system of non-financial rewards that is positively associated with EE ($\beta = .493$, $p < .001$). This relationship is partially mediated by Perceived Organisational Values (POV), with PIM positively predicting POV ($\beta = .498$, $p < .001$), which in turn predicts EE ($\beta = .155$, $p = .001$). Furthermore, the indirect effect of PIM on EE through POV is contingent upon employees' Personal Basic Values (PBV) (index of moderated mediation = .021, 95% CI [.008, .037]), suggesting that the effectiveness of IM depends partly on employees' underlying value orientations.

Originality and Value

This study contributes to IM theory by providing empirical support for its strategic conceptualisation as a values-based mechanism through which employee engagement is fostered via perceived organisational values while recognising the contingent influence of employees' personal values. It further extends existing evidence through sector-wide findings from a census survey across HEIs within a resource-constrained service context.

Research Limitations

The findings should be interpreted in light of the study's cross-sectional design and single-sector, single-country context, which may limit their generalisability.

Theoretical and Practical Implications

The findings highlight the importance of embedding organisational values within IM strategy and suggest that managers reinforce value-consistent internal communication, employee recognition and participation to strengthen sustainable EE (Kyriacou, Papasolomou and Zarkada, 2026).

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INTERNAL AUDIT AND FRAUD MANAGEMENT IN THE PUBLIC SECTOR. THE CASE OF GREECE.

Antonakis Nikolaos[1], Mitskinis Dimitrios[2], Lois Petros[3], Drogalas George[4]

[1] School of Business Administration, University of Macedonia, Thessaloniki, Greece

[2] School of Economics, Department of Economics, University of Western Macedonia, Kastoria, Greece

[3] School of Business, Department of Accounting, Economics and Finance, University of Nicosia, Nicosia, Cyprus

[4] School of Business Administration, University of Macedonia, Thessaloniki, Greece

Abstract

Purpose: This paper explores the role of internal audit in the management of fraud. Specifically, it seeks to examine the relationship between the organizational positioning, competencies, and activities of internal audit and the management of fraud within the public sector in Greece.

Design/methodology/approach: This study uses a sample of 108 questionnaires from public organizations in Greece. Statistical analysis was performed using the linear structural equation modeling (SEM) method.

Findings: Findings show that the internal audit organizational status and competence are significant factors of fraud management. As a result, when internal auditors hold the right level of authority and possess the necessary skills within an organization, they are more likely to carry out tasks that improve fraud management.

Originality/value: The originality of this study lies both in the fact that not enough research has been conducted that delves deeper into this subject and the method that was used for the data analysis.

Keywords: Public Organizations, Internal audit, Fraud management, Greece

Paper type: Research paper

Introduction

In recent years, the significance and attention afforded to internal auditing have notably increased in both the public and private sectors. Within the public sector, internal audit has assumed an increasingly prominent role over the past decades, as it serves to ensure the

preservation and effective utilization of public resources. The present study aims to explore the role of internal audit in the management of fraud. More specifically, it seeks to examine the relationship between the organizational positioning, competencies, and activities of internal audit and the management of fraud within the public sector in Greece.

Fraud constitutes a deliberate and deceptive act characterized by dishonesty and falsehood, perpetrated by an individual, group, or organization with the intention of obtaining undue advantage at the expense of others (Narayana and Ariyanto, 2020). Fraud management refers to the systematic process of assessing fraud risk on a regular basis, with the aim of identifying, evaluating, and responding to instances of fraud encountered by a public sector organization. It also involves the formulation and implementation of a comprehensive fraud control plan to ensure the coordination and strategic focus of anti-fraud measures within the organization. Effective fraud management is of paramount importance in the public sector, as its operations are particularly susceptible to recurrent types of fraudulent activity, including the misappropriation of raw materials or assets, embezzlement of funds, corruption/bribery, and illicit commissions.

This study is grounded in agency theory, with a particular emphasis on the role of internal audit in fraud management, examined through the lens of its organizational positioning, capabilities, and functional activities. Agency theory provides a useful framework not only for understanding the presence of internal audit functions within public sector entities, but also for interpreting specific attributes such as their hierarchical placement (including their relative size), the competencies of audit personnel, and the breadth of their operational activities (Adams, 1994). Nevertheless, the magnitude and nature of the contribution that each of these characteristics can offer remain open to empirical investigation. Chambers and Odar (2015) underscore the increasingly prominent role of internal auditors in fraud management, noting that their contribution is particularly critical when audit procedures pertain to public interest entities (Neu et al., 2013). Previous literature on the subject under examination is limited regarding the contribution of the organizational position, capabilities, and activities of internal audit to fraud management. However, more broadly, the relationship between internal audit and fraud management has been examined in several studies conducted in the United States, Australia, Malaysia, the United Kingdom, and the Netherlands (see Mihret, 2014; Law, 2011; Coram et al., 2008; Vanasco, 1998). The present research concentrates on the organizational status, capabilities, and activities of internal audit, as there is often a lack of clarity regarding whether audit practitioners hold a consistent understanding of these three dimensions.

The results of the study contribute to the expansion of the literature on the importance of internal auditing in fraud management, demonstrating that the organizational status and capability of internal audit have a positive impact on fraud management in public sector organizations. Furthermore, based on the findings, it is recommended that public service administrations and their internal auditors prioritize strengthening the organizational position and the competence of auditors before deciding on the specific activities to be undertaken. The findings have practical implications for regulatory bodies, such as the Institute of Internal Auditors and relevant ministries, in order to enhance the role of internal auditing across all public sector organizations.

The remainder of the paper is organized as follows. Section 2 reviews the literature and develops the hypotheses. This is followed by a discussion of the research methodology in Section 3. Section 4 presents and discusses the results. The final section provides the conclusions.

Literature Review and Hypotheses Development

Internal audit organizational status

Agency theory suggests that if internal auditing is part of the governance structure (see Jensen and Meckling, 1976), then, as indicated by Farber's (2005) findings, the quality of governance improves—something considered crucial in companies for combating fraud. The core activity of the internal auditor is the prevention and detection of fraud within the entity (Chambers and Odar, 2015). According to Ebaid (2011), the organizational status of internal auditing focuses both on the personal characteristics and personality of the internal auditor and on independence, objectivity, and support from management. The internal auditor should maintain direct communication with the audit committee and inform it of any irregularities or fraudulent activities identified (Drogalas et al., 2024). The effectiveness of internal auditing is directly influenced by the support it receives and the relationship it maintains with management (Mihret and Yismaw, 2007; Mitskinis et al., 2025). Management should filter the results of risk assessments and other information before these are communicated to the audit committee, regardless of the reporting process, thereby reducing personal threats from both the audit committee and management (Norman et al., 2010). Norman et al. (2010), in their research, showed that internal auditors should report to their managers when they feel threatened during the audit process, and they found that auditors feel more threatened when reporting directly to the audit committee. On the other hand, research by Khelil et al. (2016) shows that private access to the audit committee has a positive effect on the ethical courage

of the head of the audit function. Therefore, the exact influence of the organizational status of internal auditing remains inconclusive. Nevertheless, internal auditors are in a position to facilitate fraud management both as members of the organization and as providers of internal assurance (Stewart and Subramaniam, 2010). Based on the above, we conclude that the organizational status of internal auditing is vital for strengthening anti-fraud measures within the organization, and we formulate the following hypothesis.

H1: Internal audit organizational status is positively related with fraud management.

Internal audit competence

The concept of capability, according to Chambers (2014), refers to intelligence, education, and training—key elements that add value to an organization. The capability of internal auditing is the result of a long and intensive preparation process that includes formal education in the relevant subject, the development of skills and methods, and requires continuous study and updating. Furthermore, internal auditors' certification is considered part of their overall capability and serves as an indicator of a considerable level of competence necessary for advancement within internal audit departments (Gramling and Myers, 1997). In addition, essential characteristics such as education and experience are included, along with computer literacy and communication skills (Harrington, 2004). Basic skills of internal auditors include technical, analytical, evaluative, interpersonal, and organizational competencies (Seol and Sarkis, 2005), which, combined with their experience, contribute to the quality of their work (Gramling and Hermanson, 2009; Zain et al., 2006). These characteristics together form the capability of internal auditors and influence their decision-making related to fraud (Suwaidan and Qasim, 2010). Proper prioritization of the internal auditor’s main competencies is deemed necessary for the effective management of fraud within an organization (Chambers and Odar, 2015). Moreover, modern internal auditing is based on the three fundamental pillars of the three "E": effectiveness, efficiency, and economy (Ridley, 2008). Therefore, based on the above and as demonstrated by Roussy and Brivot (2016) regarding the profile of internal auditors and their defined criteria, we conclude that the capability of internal auditing is of vital importance for strengthening anti-fraud measures within the organization, and we formulate the following hypothesis.

H2: Internal audit competence is positively related with fraud management.

Internal audit activities

The core activities of internal auditing include evaluating the efficacy of an organization's internal audits and reporting to management on where and how those controls could be improved (Moyes and Baker, 1995). Internal auditing plays a significant role in the prevention and detection of organizational fraud and ensures that the internal audit program is properly designed (Perry and Bryan, 1997). Through a well-structured internal audit program, internal audit activities seek to detect potential fraud not only in financial data but also in non-financial aspects, such as the procedures of organizational units and compliance with laws and regulations, which contribute to effective fraud management (Rae and Subramaniam, 2008). Internal auditors exercise due diligence and are sensitive to fluctuations in management's performance incentives (Asare et al., 2008), which compels them to enhance fraud risk assessment activities by adapting audit plans accordingly. Therefore, based on the above, we conclude that internal audit activities are vital for strengthening anti-fraud measures within the organization, leading us to formulate the following hypothesis.

H3: Internal audit activities are positively related to fraud management

Sample and Research Methodology

Data collection, Sample and Questionnaire

The present study aims to explore fraud management through the lens of internal auditing. More specifically, it seeks to investigate the relationship between the organizational positioning, competencies, and activities of internal audit functions and the management of fraud within the Greek public sector. Data were collected through a structured questionnaire, a widely recognized instrument in qualitative research methodologies (Prickett and Rapley, 2001; Arvaiova et al., 2009). The design of the questionnaire was informed by an extensive review of the relevant literature and focuses on assessing fraud management in relation to the organizational status, skill sets, and operational practices of internal auditors (see Appendix). Prior to distribution, the questionnaire was reviewed and refined following consultations with three experienced internal auditors.

The questionnaire is composed of closed-ended questions to minimize ambiguous interpretations, facilitate the coding of responses, and streamline statistical analysis. The initial four questions constitute the first section, focusing on demographic information, while

the subsequent 14 questions employ a five-point Likert scale to capture respondents' levels of agreement or disagreement, ranging from "Strongly disagree" to "Strongly agree" The second section addresses the organizational status of internal auditing and comprises three questions. The third section includes five questions pertaining to the competence of internal auditing. The fourth section consists of three questions related to the activities performed by internal auditing. Finally, the fifth section contains three questions concerning fraud management, which represents the dependent variable of the study.

The management of fraud, which is the dependent variable, was formed using questions from Mihret (2014); Albrecht et al. (2012) and Archer (2011). The organizational status of internal audit, which constitutes the first independent variable, was formed using questions from Mihret and Yismaw (2007); Ebaid (2011) and Endaya and Hanefah (2013). The second independent variable, referring to the capability of internal audit, was formed using questions based on Ebaid (2011) and Chambers and Odar (2015). The third independent variable refers to the activities of internal audit, and the questions composing it were formed based on the studies of Coram et al. (2008) and Aksoy and Kahyaoglu (2013).

The research data was collected from public organizations in Greece, such as social insurance institutions, the Independent Authority for Public Revenue, hospitals, and municipalities. The questionnaires were addressed to internal auditors and financial department directors, who are primarily involved in fraud management. The respondents were selected based on their position and expertise (McEvily and Marcus, 2005).

A total of 135 emails were sent, and 115 responses were received. Of these, 7 were excluded due to missing essential data, resulting in 108 valid responses, corresponding to a response rate of 80%. According to the literature (Hair et al., 2017), a minimum of 10–20 observations per predictor variable is required. Given that the present study includes three independent variables, at least 60 observations are needed, making the sample size adequate. Furthermore, Bollen (1989) recommends a sample-to-parameter ratio of at least 5:1 for metric analysis. Thus, for the 14 questionnaire items, at least 70 observations are required—another criterion that is met.

Methodology analysis

The researchers examined the model using the SPSS 29 software in combination with AMOS 20. At first, scale verification was performed. The scales were verified using the Cronbach's alpha estimate of credibility. The research hypotheses were verified by structural equation modeling (SEM) using the AMOS 20 software. For the purposes of the research, three

independent variables and one dependent variable were identified. The dependent variable refers to the "fraud management" while the three independent variables representing the corresponding hypotheses refer to the "internal audit organizational status", the "internal audit competence" and the "internal audit activities".

Results

Descriptive Statistics

The descriptive statistics are provided below.

		Frequency	Percent
Age group	18 - 30	15	13.9
	31 – 50	56	51.8
	51 <	37	34.3
Education level	Bachelor's Degree	29	26.9
	Master's Degree	74	68.5
	Doctoral Degree	5	4.6
Experience	0-5 years	11	10.2
	6-10 years	27	25.0
	11-15 years	17	15.7
	16-20 years	28	25.9
	21 years or more	25	23.2
Organization size (staff)	1 – 50	8	7.4
	51 – 100	36	33.3
	101 – 200	52	48.2
	201 <	12	11.1

Table 1: Sample's descriptive statistics
(source: authors' survey, 2026)

According to Table 1, out of a total of 108 people, 68.5% of respondents hold a Master's degree. 51.8% of the sample which participated in the questionnaire belong to the age group 31-50 while 25.9% of the respondents have experience between 16 and 20 years.

Testing of Cronbach's alpha coefficient

Results of testing of Cronbach's Alpha coefficient are shown in Table 2.

No	Scales	Symbol	Number of obs. variables	Cronbach's Alpha
	Independent variables			
1	Internal audit organizational status	IAOS	3	0.748
2	Internal audit competence	IAC	5	0.878
3	Internal audit activities	IAA	3	0.715
	Dependent variables			
1	Fraud management	FM	3	0.721

Table 2: Results of testing of Cronbach's Alpha coefficient of scales

(source: authors' survey, 2026)

The results of the Cronbach's alpha tests for the ranges described in Table 2 above showed that these scales had the Cronbach coefficient of > 0.6.

Testing of model and research hypotheses

Researchers employ the Structural Equation Modeling (SEM) approach to validate existing models and research hypotheses (Hai and Tu, 2019). The reliability of the measurement model was assessed using the Comparative Fit Index (CFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA) (Zu et al., 2010; Kline, 2015). According to recommended criteria in the literature (Hu and Bentler, 1999; Byrne, 2013), all indicators fall within acceptable ranges, suggesting a good model fit. The CFI value is 0.901 — on a scale from 0 to 1, values near 0.90 or higher are considered acceptable (Bentler, 1992), with 1.0 indicating a perfect fit. The RMSEA is 0.080, which is right at the threshold; Hu and Bentler (1999) state that values below 0.080 indicate an acceptable fit. The SRMR value is 0.041, which is well below the 0.080 threshold, and values close to 0.00 reflect a near-perfect fit. Additionally, the model has 74 degrees of freedom and a p-value of 0.000 (< 0.05), indicating statistical significance (Hair et al., 2006). The Chi-square to degrees of freedom ratio (χ^2/df) is 2.043, which is below the acceptable maximum of 5.0 (Lomax and Schumacker, 2004). According to the regression

weights (Table 4), the internal audit organizational status and competence have the same significant impact on the fraud management.

The results suggest that fraud management is likely to improve when the internal audit function reports administratively to executive management and functionally to the board's audit committee. This supports the idea that the internal audit's hybrid reporting structure enhances governance quality, which is especially crucial in organizations prone to fraud (Farber, 2005), such as public organizations — making agency theory a useful lens for examining differences in how fraud is managed. The findings also indicate that management should consistently seek input from internal audit when aiming to enhance fraud management practices. In this context, the internal audit function is viewed as a collaborator with management in efforts to enhance fraud management. This aligns with Norman et al.'s (2010) finding that internal auditors might perceive a higher risk of fraud when they report to executive management instead of the audit committee.

Also, internal auditor's competence thus plays a key role in stirring entity-wide fraud awareness, fraud investigations and reporting. Especially, the sufficient continuing professional development and the skills of internal auditors play an important role in fraud management. As a result, internal audit competence enhances adherence to audit plans and improves the clarity of audit reports presented to management and the audit committee, ensuring effective communication of fraud investigation findings and appropriate action when fraud is detected.

Relationship			Estimate	S.E.	C.R.	P	Label
IAOS	<--	FM	0.805	0.102	7.922	***	H1 Accepted
IAC	<--	FM	0.933	0.104	8.950	***	H2 Accepted
IAA	<--	FM	0.071	0.056	1.275	0.202	H3 Rejected

Table 4: Results of the discriminant validity test for research concepts and of the hypotheses testing.

(source: authors' survey, 2026)

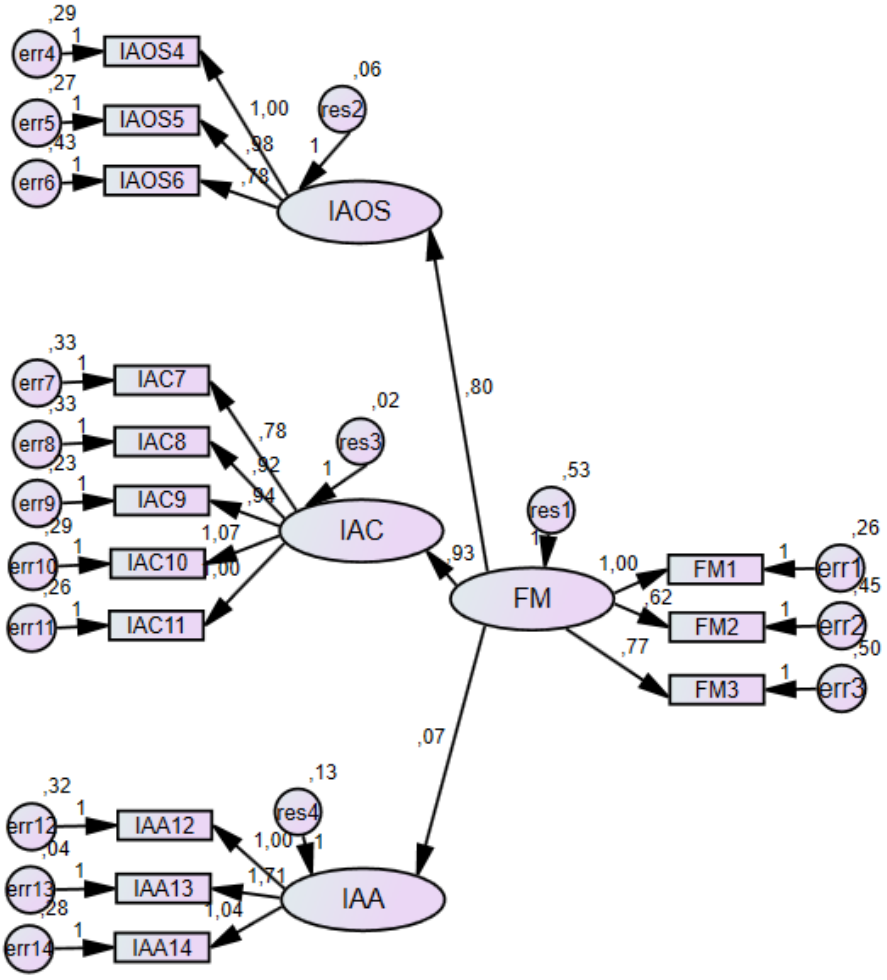


Figure 1: Results of the model testing
(source: authors' survey, 2026)

Conclusions

The purpose of this paper is to examine the contribution made by the internal audit organizational status, internal audit competence and internal audit activities on fraud management in the Greek public organizations. We conducted a survey with a sample of 108 participants working in public organizations who are internal audit managers and department heads. When internal auditors are skilled and hold a respected position within the organization, they are more likely to engage in activities that strengthen fraud management.

This study offers several implications. This study investigates the influence of the internal audit function's organizational status on the effectiveness of fraud management. It posits that internal auditors who maintain independence, characterized by functional reporting to the

audit committee and administrative reporting to executive management, are better positioned to enhance the processes of fraud prevention, detection, and reporting. In addition, the study has shown that internal auditors who possess adequate expertise, competencies, and experience are more capable of assisting management in developing robust anti-fraud strategies. The findings have practical implications for regulatory bodies, such as the Institute of Internal Auditors and relevant ministries, in order to enhance the role of internal auditing across all public sector organizations. Also, this research helps internal auditors in fraud prevention, detection and reporting as necessary.

Nevertheless, the study has some limitations concerning the design of the questionnaire, notably the reliance on closed-ended questions, which limits the depth of information, gathered. Furthermore, the small sample size restricts the scope of the conclusions that can be drawn but also serves as an incentive for future studies to involve a larger sample and a wider variety of targeted questions, which would enhance the understanding of the topic being investigated. Finally, this study aspires to contribute to the limited related literature using a sample of public organizations and to support the contribution of internal audit organizational status and competence in fraud management.

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Appendix

Questionnaire

Kindly, evaluate the subsequent variable items using the criterion shown below:

- Strongly disagree
- Disagree
- Neither disagree / nor agree.
- Agree
- Strongly agree

Internal audit organizational status

- Internal audit maintains an administrative reporting relationship with executive management
- Internal audit functionally reports directly to the audit committee.
- Internal audit advises management on fraud management.

Internal audit competence

- Internal auditors consistently receive guidance on performance standards.
- Internal auditors receive training to develop the skills required to carry out their responsibilities.
- Exists a sufficient continuing professional development for internal auditors.
- Internal audit findings are always based on documents and reliable data.
- Internal audit is carried out in accordance with international standards for professional performance of internal audit.

Internal audit activities

- Internal audit provides an independent assessment of how effectively management is performing.
- Internal audit serves to ensure the organization's assets are not subject to misuse or misappropriation.
- Internal audit participates in the preparation of the risk treatment plans.

Fraud management

- We take appropriate action in case of detected fraud.
- We have established procedures for disclosing evidence related to identified fraud.
- Risk based internal audits are carried out in our organization.

SCALING DIGITAL PLATFORM INTERNATIONALIZATION IN LOGISTICS ECOSYSTEMS: INSIGHTS FROM OPEN SYLLO

Filipe, Sandra[1]; Marques, Daniela[2]; Ribau, Cláudia[1]

[1] GOVCOPP Research Unit & ISCA-UA, University of Aveiro, Portugal
[2] ISCA-UA, University of Aveiro, Portugal

Digital transformation is changing how logistics actors coordinate activities, exchange information and develop services across organisational and geographical boundaries. In this setting, digital platforms can support data sharing, interoperability and collaboration among ports, logistics operators, transport companies, technology providers and public institutions. Their relevance is particularly evident in logistics ecosystems, where fragmented information flows and heterogeneous technological systems can constrain operational visibility, efficiency and innovation (Ben-Daya et al., 2019; Baptista and Nunes, 2025).

This study investigates how digital strategies contribute to the internationalization of Open Syllo, a logistics data platform developed within the NEXUS Agenda innovation ecosystem. Rather than interpreting internationalization primarily as a sequence of country-entry decisions, the study examines it as a process of extending a platform ecosystem across geographical contexts. This perspective responds to the limitations of conventional internationalization approaches, which tend to emphasise gradual commitment and experiential learning by individual firms (Johanson and Vahlne, 2009). Although these concepts remain useful, digital platforms may grow internationally through distributed users, partner networks, digital connectivity and data-based services, often with less dependence on physical presence (Ojala et al., 2018; Zeng et al., 2019).

The research uses a qualitative single-case design based on secondary data. The evidence includes NEXUS project documentation, notably internationalization and marketing plans, stakeholder-related reports and documents concerning the strategic positioning and development of Open Syllo. Materials produced between 2024 and 2026 were analysed thematically. The analysis focused on four interconnected areas: the platform's internationalization approach, its use of digital communication, stakeholder participation and ecosystem partnerships.

Open Syllo functions as a shared digital environment that supports the integration and management of logistics data. It enables actors to exchange information in a structured manner and provides a basis for developing complementary data-driven applications and services. Its international potential derives from this scalable infrastructure, but also from the ability to organise relationships among actors with different roles, knowledge and interests. Therefore, technological availability is necessary but insufficient for cross-border platform expansion (NEXUS Agenda, 2026).

The findings show that Open Syllo's international development is shaped by ecosystem-building activities. International events, online communication and collaboration with external organisations contribute to making the platform visible and credible in logistics and innovation networks. Digital channels are particularly important because they communicate the platform's purpose and capabilities to dispersed audiences while maintaining regular interaction with current and potential stakeholders. Their function is therefore not limited to promotion: they can contribute to legitimacy, relationship development and coordination across borders (Watson et al., 2018; Kromidha and Robson, 2021).

Stakeholder engagement is equally important. Logistics actors, port authorities, technology firms, research organisations and public institutions can contribute operational knowledge, data, technological capabilities and access to local networks. In new geographical contexts, these organisations can facilitate implementation, help adapt services to local conditions and reduce uncertainty among prospective adopters. Partnerships consequently operate as more than supporting arrangements: they can become practical channels through which a platform enters and becomes embedded in new markets.

The study contributes to research on digital internationalization by highlighting an ecosystem-based interpretation of platform expansion. The Open Syllo case suggests that international scaling results from the interaction between digital infrastructure, communication, stakeholder involvement and collaborative partnerships. For platform managers, this implies that international growth requires active ecosystem orchestration, including trust-building, transparent communication, clear participation incentives and attention to interoperability. Policymakers can support these processes by encouraging common data standards, interoperable digital infrastructures and international collaboration in logistics and mobility ecosystems.

Keywords: Digital platforms; digital strategy; internationalization; innovation ecosystems; logistics platforms; NEXUS Agenda.

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IMPACT OF LEAN MANUFACTURING PRACTICES ON OPERATIONAL EFFICIENCY IN THE FOOD INDUSTRY

Kanany Eid[1]; EL Naddaf, Sami [2]; Nader Nader [3]

[1]Department of Management, Antonine University, Lebanon

[2]Department of Management, University of Nicosia, Nicosia, Cyprus

[3]Department of Accounting and Auditing, Antonine University, Lebanon

Keywords: Lean Manufacturing, Operational Efficiency, Food Industry, Process Improvement, Quality Performance, Cost Reduction, Sustainability.

Dixit, Dave and Singh (2015) argue that lean manufacturing is a systematic approach aimed at eliminating non-value-added activities, improving process flow, and maximizing customer value through continuous improvement practices. It integrates techniques such as Just-In-Time (JIT), Kaizen, and waste reduction to enhance operational efficiency. LM has evolved into a widely adopted management philosophy across industries, demonstrating significant improvements in productivity, cost reduction, and quality performance (Bhamu and Sangwan, 2014; Tortorella et al., 2020).

Although lean manufacturing is a comprehensive strategy for eliminating waste, improving process flow, and maximizing customer value across various industries, its application in the food industry presents several unique challenges (Aleksandar, 2022). These include strict food safety regulations, product perishability, fluctuating demand, and complex supply chain coordination. Such constraints often limit the effective implementation of lean practices and require adaptation to industry-specific conditions. Despite the growing interest in lean's implementation, the research evidence analyzing the effect of lean on operational efficiency amongst food manufacturing firms, especially in developing economies, is still limited. Food manufacturers operate in an environment where input costs are increasing, pressure to compete and to meet ever higher customer expectations for quality and sustainability are growing. Operational inefficiencies like overproduction, waiting time, excess inventory, and process variability have a direct effect on

profitability and performance. Lean tools like 5S, Kanban, Just-In-Time (JIT), Total Quality Management (TQM) and Total Productive Maintenance (TPM) are commonly encouraged as mechanisms to remedy these inefficiencies (Bhamu and Sangwan, 2014). However, the degree to which these practices lead to measurable improvements in the food sector operationally, needs to be investigated on a larger empirical basis. The purpose of this study is to look at the effect of lean manufacturing patterns on operational effectiveness in the food industry. The central research question is stated as follows: What is the impact of lean manufacturing practices on the dimensions of operational efficiency in food manufacturing companies?

A quantitative research design will be used, where data will be gathered using a structured questionnaire using a population of 200 professionals working in food manufacturing companies in the form of managers and supervisors. The questionnaire measures the extent to which lean practices are adopted and the extent to which they are perceived to impact operational efficiency indicators, namely quality performance, cost reduction, and production timeliness. The study is expected to indicate a moderate to high level of lean adoption, with commonly used tools including 5S, Kaizen, and TQM. It is also anticipated that the results will reveal a significant positive relationship between lean implementation and quality performance, particularly in reducing defects and improving process consistency.

Moreover, potential challenges that may hinder full lean implementation, such as employee resistance and insufficient training are to be identified.

This research is expected to contribute to the existing literature by providing empirical insights into the impact of lean practices on operational efficiency in the food industry, while identifying key barriers to successful implementation. It extends current research by integrating efficiency measures with barrier analysis and offers practical guidance for managers seeking structured approaches to performance improvement, emphasizing the strategic role of lean adoption in achieving sustainable operational outcomes.

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REFRAMING ORGANISATIONAL PERFORMANCE: FROM OUTCOME CONTROL TO IMPACT DESIGN

Haupt, Joerg
Smart-F-Solutions LTD., Larnaca, Cyprus

Keywords: Organisational Performance, Impact Design, Business Model, Organisational Identity, Customer Relationship Quality, Leadership, Systemic Management, Strategy

Introduction

Organisational performance remains a central concern in both management research and practice. Over recent decades, organisations have increasingly relied on performance measurement systems, targets, and control mechanisms to steer outcomes. Kaplan and Norton (1996) demonstrated that structured performance measurement systems can translate strategy into operational execution and improve alignment across organisational levels.

While such approaches have contributed to transparency and operational discipline, more recent research highlights their limitations in complex and dynamic environments. de Araújo et al. (2024) show that traditional performance management systems often struggle to capture systemic interdependencies and non-linear cause–and–effect relationships, which are characteristic of modern organisations.

In practice, a persistent paradox can be observed: the increasing use of performance indicators is often accompanied by rising coordination costs, reduced adaptability, and declining clarity of direction. This suggests that performance cannot be fully explained by measurable outputs alone. Instead, it appears to emerge from deeper systemic conditions that shape how organisations function.

This observation is not entirely new. Similar limitations have been discussed in different research streams over several decades. However, despite conceptual advances and numerous practical initiatives, these insights have not yet been systematically integrated into coherent models of organisational performance.

At the same time, organisations are increasingly operating in digitally mediated environments. Advances in digital technologies, data analytics, and artificial intelligence have fundamentally changed how organisations interact internally and with external stakeholders.

These developments have significantly expanded the possibilities for coordination, communication, and performance monitoring. However, they have also introduced new forms of complexity. Customer interactions are often fragmented across multiple channels, organisational processes are increasingly technology-dependent, and decision-making is influenced by growing volumes of data.

Despite this transformation, the role of technology is often treated as a separate or purely operational concern. Existing performance models rarely integrate technological factors into a coherent explanation of how organisational performance emerges.

This creates an additional gap: the lack of integration between human, organisational, and technological dimensions in the design of organisational performance.

Research Gap and Objectives

The academic discourse on organisational performance is characterised by multiple well-developed but largely disconnected perspectives.

Performance management research has primarily focused on measurement systems and control mechanisms (Kaplan and Norton, 1996). Leadership and organisational behaviour research has emphasised the importance of culture, values, and behavioural patterns in shaping organisational outcomes (Schein, 2010). Capability-based perspectives, particularly the dynamic capabilities framework, have highlighted the importance of adaptability and resource reconfiguration for long-term competitiveness (Teece, 2007; Zhang et al., 2023).

In addition, research on engagement and human dynamics has demonstrated that psychological conditions such as trust, autonomy, and involvement significantly influence individual and collective performance (Kahn, 1990; Edmondson, 2018; Gallup, 2023). Systems thinking has further emphasised that organisational outcomes emerge from the interaction of multiple interconnected elements rather than from isolated actions (Ackoff, 1999; Malik, 2010).

Despite these advances, three key shortcomings can be identified:

- **Fragmentation of perspectives**
  Behavioural dynamics, organisational capabilities, and performance management are typically analysed separately, even though they are systemically interconnected.
- **Limited focus on underlying conditions**
  Performance is often assessed at the level of outputs and indicators, while the underlying conditions that generate performance remain insufficiently addressed.
- **Lack of integrated models**

There is a lack of conceptual frameworks that systematically link behavioural, capability-based, and steering-related dimensions into a coherent system of organisational performance.

This paper addresses this integration gap by developing the concept of **Result Architecture**. The central research question is:

How can organisations move from managing results to designing the conditions under which sustainable performance and results emerge?

Literature Review and Theoretical Framework

The literature on organisational performance can be grouped into four major streams, each providing important insights but remaining limited in isolation.

Performance management

Performance management research has traditionally focused on measurement systems and strategic alignment. Kaplan and Norton (1996) demonstrated how performance indicators can link strategic objectives with operational activities.

However, more recent research indicates that such approaches often fail to capture complexity. de Araújo et al. (2024) show that performance management systems tend to focus on linear cause–effect relationships and struggle to reflect systemic interactions, which are critical in dynamic environments.

Leadership and behavioural dynamics

Leadership and organisational behaviour research emphasises the importance of culture, values, and interaction patterns. Schein (2010) argues that organisational behaviour is deeply rooted in shared assumptions that shape how individuals perceive and respond to their environment.

Research on engagement further supports this perspective. Kahn (1990) demonstrated that psychological conditions such as meaningfulness, safety, and availability influence engagement and performance. More recent work by Edmondson (2018) highlights the role of psychological safety in enabling learning, collaboration, and performance. Empirical data from Gallup (2023) confirms that engagement levels remain a critical determinant of organisational outcomes across industries.

Capabilities and adaptability

Capability-based perspectives focus on the ability of organisations to adapt and remain competitive. Teece (2007) introduced the concept of dynamic capabilities, describing how

organisations can integrate, build, and reconfigure internal and external competencies in response to changing environments.

More recent research extends this perspective. Zhang et al. (2023) show that dynamic capabilities are strongly linked to organisational performance, while Baishya et al. (2025) highlight the role of managerial capabilities in shaping organisational effectiveness.

Systems thinking

Systems thinking provides a holistic perspective on organisations. Ackoff (1999) argues that organisational outcomes are primarily determined by system design rather than by individual actions. Malik (2010) further emphasises that managing complexity requires a systemic approach that integrates multiple dimensions of organisational functioning.

Synthesis

While each of these perspectives provides valuable insights, they remain insufficiently integrated. Performance management focuses on outputs, leadership research focuses on behaviour, capability-based approaches focus on resources, and systems thinking focuses on structure.

What is missing is a coherent framework that integrates these dimensions into a unified explanation of how organisational performance emerges.

Methodology and Conceptual Approach

This study adopts a conceptual research design to integrate fragmented theoretical perspectives into a coherent framework. Conceptual research is particularly suitable in contexts where existing theories provide partial explanations but lack integration into a unified system (Jaakkola, 2020).

In this context, the present study contributes by developing an integrative framework that connects behavioural, capability-based, and steering-related perspectives into a unified explanation of organisational performance.

The conceptual model developed in this paper is informed by extensive practical experience in organisational development and performance management. These observations revealed recurring patterns regarding the interaction between behavioural dynamics, organisational capabilities, and performance outcomes.

In particular, practical experience indicates that organisational performance is rarely determined by isolated factors, but rather emerges from the interplay between leadership behaviour, the

level of competence within the organisation, and the clarity of strategic direction. These patterns have been observed consistently across multiple organisational contexts.

While these insights provide the empirical intuition underlying the model, the purpose of this paper is to translate them into a conceptually structured and theoretically grounded framework. The methodological approach, therefore, combines:

- theory integration
- structural synthesis
- conceptual abstraction

This enables the development of a coherent system model that integrates behavioural, capability-based, and steering-related perspectives into a unified explanation of organisational performance.

Findings: The Result Architecture

The central finding of this study is that organisational performance cannot be adequately explained or managed at the level of outcomes alone. Instead, it emerges from the interaction of underlying systemic conditions.

The Result Architecture provides a structured framework for understanding and designing these conditions.

Causal logic of organisational performance

At the core of the Result Architecture lies a clear causal relationship: Impact → Performance → Results.

Results represent the observable outcomes of organisational activity. Performance reflects the quality and effectiveness of execution. However, performance itself is not a primary input, but the consequence of underlying organisational conditions.

This perspective is consistent with systems thinking, which emphasises that outcomes arise from the structure and dynamics of the system rather than from isolated actions (Ackoff, 1999).

While the causal logic explains how organisational results emerge, it does not yet provide a structured framework for designing the underlying conditions. To address this limitation, the concept of Result Architecture is introduced. It provides a systematic approach to organising and aligning the key dimensions that shape organisational impact, performance, and results.

Anchoring in the business model and organisational identity

The Result Architecture is anchored in the organisation’s business model, which defines its strategic direction and intended value proposition within the market.

At the same time, the business model reflects the organisation's identity, understood as the consistent expression of its purpose, positioning, and behavioural orientation. This understanding is aligned with organisational culture research, which emphasises the role of shared assumptions and values in shaping organisational behaviour (Schein, 2010).

The integration of business model and identity ensures that strategic intent is not only defined conceptually but also consistently translated into behaviour.

This becomes particularly visible in the quality of customer relationships. Customer interactions reflect how internal organisational dynamics are translated into external value and therefore serve as a direct indicator of organisational effectiveness. Empirical research confirms that engagement and relational quality are closely linked to organisational performance (Gallup, 2023).

Core Dimensions of the Result Architecture

The Result Architecture integrates three interdependent dimensions that jointly determine organisational performance: impact, competence, and steering.

Impact: The impact dimension captures the behavioural and relational dynamics within the organisation. It reflects how individuals and teams think, act, interact, and make decisions in everyday organisational contexts.

This includes leadership behaviour, communication patterns, levels of engagement, trust, and the overall quality of collaboration. Research on organisational culture shows that shared assumptions and behavioural norms strongly influence how organisations function (Schein, 2010).

In addition, research on engagement demonstrates that psychological conditions such as meaningfulness, safety, and involvement significantly affect individual performance (Kahn, 1990). Edmondson (2018) further highlights that psychological safety enables learning, collaboration, and innovation, which are critical for organisational effectiveness.

From a systemic perspective, impact represents the underlying "energy" of the organisation. It determines whether capabilities are effectively utilised and whether organisational structures function as intended (Ackoff, 1999).

Impact is particularly visible in the quality of customer relationships. These interactions reflect how internal dynamics are translated into external value. Empirical evidence shows that higher levels of engagement and relational quality are associated with improved performance outcomes (Gallup, 2023).

Without a coherent, aligned impact dimension, even well-defined strategies and strong capabilities cannot translate into sustainable performance.

In practice, this dimension can be operationalised through structured approaches to engagement, process quality, and leadership behaviour, as reflected in integrated performance frameworks.

Competence: The competence dimension refers to the organisation's ability to translate intentions into effective, consistent, and scalable action.

It encompasses technical expertise, methodological capabilities, and personal and social competencies. These elements determine how reliably tasks are executed, how problems are solved, and how efficiently resources are utilised.

The importance of capabilities for organisational performance is well established in the literature. Teece (2007) introduced the concept of dynamic capabilities, emphasising the ability of organisations to integrate, build, and reconfigure competencies in response to changing environments.

More recent research confirms that dynamic capabilities are strongly associated with organisational performance and adaptability (Zhang et al., 2023). Baishya et al. (2025) further highlight the role of managerial capabilities in shaping organisational effectiveness.

Competence provides the structural stability of organisational performance. It ensures that performance is not dependent on individual effort alone, but can be reproduced across teams and over time.

Without sufficient competence, even high levels of engagement and strong leadership cannot be translated into consistent outcomes. Conversely, competence without aligned impact may lead to technically correct but strategically misaligned actions.

The competence dimension can be further specified through structured competency architectures that integrate technical, methodological, and behavioural capabilities across organisational levels.

Steering: The steering dimension provides direction, alignment, and focus within the organisation.

It includes strategic priorities, decision-making structures, governance mechanisms, and resource allocation. Steering defines what is relevant, what is prioritised, and how organisational attention is directed.

From a systemic perspective, steering ensures alignment between organisational activities and strategic intent. This aligns with systems thinking approaches, which emphasise that effective system design requires clear orientation and coherence (Ackoff, 1999).

Malik (2010) further argues that managing complexity requires clear principles of direction and decision-making rather than excessive control. This perspective highlights that effective steering creates orientation rather than relying solely on control mechanisms.

Effective steering enables decentralised action while maintaining overall coherence. It ensures that organisational activities remain aligned with the business model and organisational identity. Without effective steering, organisational efforts may become fragmented, leading to inefficiencies and conflicting priorities, even if impact and competence are strong.

The steering dimension can be supported by management frameworks that integrate governance, strategic alignment, and leadership processes into a coherent system of organisational direction.

Interdependence of the dimensions: The three dimensions are highly interdependent and cannot be managed in isolation.

- Impact shapes how competence is applied
- Competence determines how effectively impact is translated into performance
- Steering aligns both dimensions with organisational direction

Sustainable organisational performance emerges only when all three dimensions are coherently aligned. Weaknesses in one dimension cannot be fully compensated by strengths in others.

Differentiation of results: To provide a more precise understanding of organisational outcomes, results can be differentiated into four key dimensions:

- Revenue
- Quality
- Reputation (internal and external)
- Profitability

This differentiation reflects the multi-dimensional nature of organisational performance and allows for a more nuanced interpretation of outcomes.

Technology as an Amplifier of Organisational Impact

While the Result Architecture explains organisational performance through the interaction of impact, competence, and steering, an additional dimension has become increasingly relevant in contemporary organisational contexts: the role of technology.

In many traditional models of organisational performance, technology is treated primarily as an operational or supportive element. However, this perspective underestimates its systemic influence. In digitally mediated environments, organisational impact no longer emerges solely from human interaction but from the interplay between human behaviour, organisational processes, and technological systems.

From this perspective, technology does not constitute an independent dimension of organisational performance. Instead, it functions as a cross-dimensional factor that shapes and amplifies the existing components of the Result Architecture.

- Technology directly affects the impact dimension. Communication, collaboration, and customer interaction are increasingly mediated through digital interfaces. As a result, the quality of organisational impact is co-determined by the design and integration of technological systems. Customer relationship quality, in particular, is no longer exclusively shaped by interpersonal interaction but also by the consistency, responsiveness, and coherence of digital touchpoints.
- Technology transforms the competence dimension. Beyond traditional technical and behavioural capabilities, organisations must develop the ability to integrate and utilise technological systems, including data-driven tools and artificial intelligence, effectively. This form of "technological competence" goes beyond technical proficiency and includes the capacity to design meaningful interactions between human and digital elements.
- Technology expands the possibilities of the steering dimension. The increasing availability of real-time data enables more precise monitoring and decision-making. However, this does not reduce the need for managerial judgement. On the contrary, the availability of data increases the complexity of decision-making and reinforces the importance of coherent orientation and prioritisation.

Taken together, technology can be understood as a structural amplifier of organisational impact. It enhances the reach, consistency, and scalability of organisational behaviour, but also increases the consequences of misalignment. Poorly designed technological systems can fragment communication, reduce relational quality, and introduce additional complexity into the organisation.

This perspective suggests that the integration of technology is not primarily a question of digital adoption, but of systemic design. Organisations must deliberately align technological systems with their underlying impact logic to ensure that performance emerges coherently and sustainably.

Result Architecture and Its Relationship to Organisational Performance

The following figure integrates the core elements of the Result Architecture and illustrates their relationship to organisational performance.

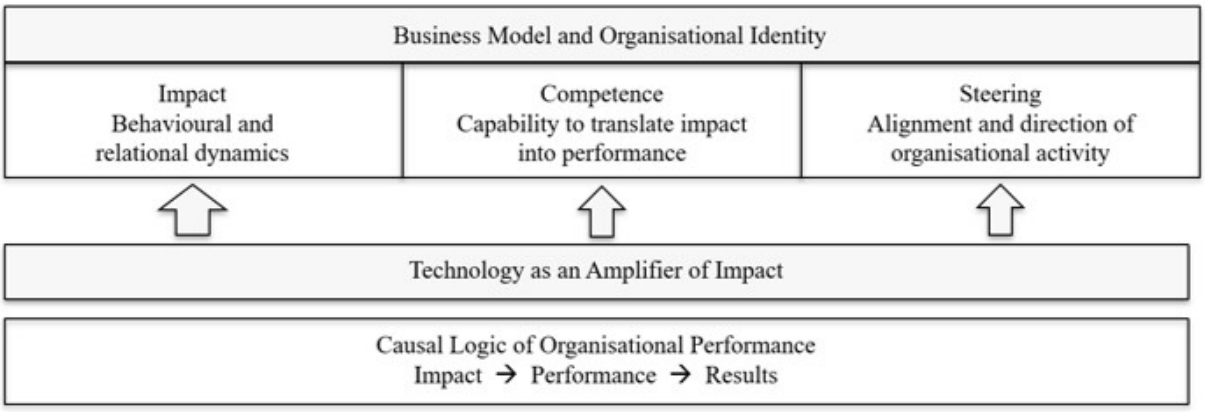


Figure 1: *Illustration of the Result Architecture and its relationship to organisational performance.*

The architecture is anchored in the organisation's business model and identity and comprises three interdependent dimensions: impact, competence, and steering. Technology is conceptualised as a cross-dimensional amplifier that influences these dimensions. Organisational performance emerges through the causal logic from impact to performance and results.

Expected Impact of the Result Architecture

The Result Architecture provides a structured approach to addressing fundamental challenges in organisational performance by shifting the focus from controlling outcomes to designing the underlying conditions.

- The model enables a reduction of organisational complexity. Traditional performance management approaches often rely on increasing levels of measurement and control, which can lead to fragmentation and coordination inefficiencies. By contrast, the Result Architecture focuses on aligning impact, competence, and steering, thereby creating more coherent organisational behaviour. This perspective is consistent with systems thinking, which emphasises that system design is more effective than isolated interventions (Ackoff, 1999).
- The model strengthens the connection between internal organisational dynamics and external value creation. By placing customer relationship quality at the centre of organisational effectiveness, the Result Architecture establishes a direct link between behaviour, interaction, and market outcomes. Empirical research indicates that engagement and relational quality are strongly associated with performance indicators such as productivity, customer loyalty, and profitability (Gallup, 2023).
- The integrated perspective on impact, competence, and steering enhances organisational adaptability. Rather than addressing the behavioural, capability-based, and strategic

dimensions separately, the model provides a coherent framework for aligning them. This is particularly relevant in dynamic environments, where adaptability depends on the interaction of multiple organisational factors (Teece, 2007; Zhang et al., 2023).

Finally, differentiating results into revenue, quality, reputation, and profitability enables a more nuanced understanding of organisational performance. This multi-dimensional perspective allows organisations to move beyond simplified performance indicators and to develop more targeted and effective managerial interventions.

Discussion

The Result Architecture integrates previously fragmented research streams into a coherent conceptual framework. It connects insights from performance management, leadership and behavioural research, capability-based perspectives, and systems thinking into a unified explanation of organisational performance.

From a theoretical perspective, the model extends traditional performance management approaches by shifting the focus from outputs to underlying systemic conditions. While performance management research has traditionally emphasised measurement and control (Kaplan and Norton, 1996), the Result Architecture highlights the importance of behavioural dynamics, organisational capabilities, and alignment mechanisms as primary drivers of performance.

This perspective is consistent with leadership and organisational behaviour research, which emphasises the importance of culture, values, and interaction patterns (Schein, 2010; Edmondson, 2018). It also aligns with capability-based approaches, which highlight the role of adaptability and resource reconfiguration (Teece, 2007), as well as with systems thinking, which emphasises the importance of system design and interdependencies (Ackoff, 1999; Malik, 2010).

By integrating these perspectives, the Result Architecture provides a more comprehensive explanation of organisational performance. It challenges the assumption that results can be directly controlled and instead emphasises that performance emerges from the alignment of underlying conditions.

Theoretical Contribution

This paper contributes to the literature in three main ways.

- It integrates previously fragmented perspectives on organisational performance into a coherent conceptual framework. By linking behavioural dynamics, organisational capabilities, and steering mechanisms, it provides a more comprehensive understanding of how performance emerges.
- It shifts the level of analysis from outputs to systemic conditions. Rather than focusing solely on performance indicators, the Result Architecture emphasises the underlying drivers of performance, thereby extending existing performance management approaches.
- The paper demonstrates the value of conceptual integration as a methodological approach. By synthesising insights from different research streams, it contributes to the development of theory in contexts characterised by complexity and fragmentation (Jaakkola, 2020).

In addition, the paper extends existing perspectives on organisational performance by integrating technology as a systemic factor. Rather than treating technology as a separate domain, the Result Architecture conceptualises it as a cross-dimensional element that shapes and amplifies impact, competence, and steering.

This perspective contributes to the literature by linking technological and human-centric views of organisational performance. It suggests that performance in contemporary organisations cannot be fully understood without considering how digital systems influence behavioural dynamics, capability development, and decision-making processes.

By embedding technology within a systemic impact logic, the paper provides a more comprehensive framework for analysing and designing organisational performance in digitally mediated environments.

Managerial Implications

The findings of this study have several implications for management practice.

- Organisations should reconsider their reliance on outcome-based control as the primary mechanism for managing performance. While performance indicators remain important, they should be complemented by a focus on the underlying conditions that generate performance.
- Management attention should shift towards the deliberate design of impact, competence, and steering. This requires a holistic perspective that integrates behavioural, capability-based, and strategic dimensions.

- The alignment of business model and organisational identity should be recognised as a central element of organisational effectiveness. Consistency between strategic intent, behaviour, and external perception is critical for sustainable performance.

Finally, differentiating results into revenue, quality, reputation, and profitability provides a practical framework for analysing and managing organisational outcomes more effectively.

Research Limitations and Future Research

As a conceptual study, this paper does not provide empirical validation of the proposed model. While the model is informed by practical observations and theoretical integration, its generalisability remains to be tested.

Future research should focus on empirical validation of the Result Architecture. In particular, the following areas represent promising directions:

- Quantitative studies could examine the relationship between the three core dimensions (impact, competence, and steering) and different performance outcomes.
- The role of customer relationship quality as a mediating variable between internal organisational dynamics and external results should be investigated.
- Longitudinal studies could analyse how the interaction between impact, competence, and steering evolves over time and influences organisational adaptability.
- Comparative studies could analyse organisations applying traditional performance management approaches versus those adopting a systemic design perspective.

These research directions provide a basis for further development and validation of the proposed model.

Conclusion

This paper reframes organisational performance as an emergent property of systemic conditions rather than a directly controllable outcome.

By introducing the concept of Result Architecture, it provides a structured framework for understanding and designing the conditions under which sustainable performance and results can emerge.

The integration of behavioural dynamics, organisational capabilities, and steering mechanisms offers a comprehensive perspective on organisational effectiveness. Anchored in the business model and organisational identity, the model connects internal dynamics with external

outcomes and provides a foundation for both practical application and future research in increasingly digitally mediated organisational environments.

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TIME OF CRISIS: HOW TO BUILD A RESILIENT ORGANISATION?

Ligita, Šimanskienė[1]; Jurgita, Paužuolienė[2]; Birutė, Paulikienė[3]; Mariantonietta, Fiore[4]

[1,2,3] Department of Management and Economics, Klaipeda University, Lithuania

[4] Department of Economics, University of Foggia, Italy

Keywords: resilience, organisational resilience, service sector, crisis.

Introduction

In the first decade of the twenty-first century, the topic of organisational resilience to unforeseen events gained prominence in scholarly research, highlighting the increasing frequency of events caused by extreme natural disasters—droughts, floods, and earthquakes. Periods of crisis expose organisational vulnerabilities while simultaneously creating opportunities for renewal, innovation, and long-term transformation. Organisational resilience has emerged as a strategic capability that enables organisations not only to withstand disruptions but also to adapt, learn, and emerge stronger from adverse events. Recent studies highlight the significant role of the human dimension—such as leadership styles, employee well-being, and personal and professional factors—in shaping responses to disasters. Furthermore, research has shown that employee resilience is a key determinant of organisational resilience as a whole (Liang & Cao, 2021). However, the resilience of organisations has not yet been sufficiently examined simultaneously at organisational level. The aim of the study is to evaluate the interaction of resilience across organisational level in workplace crisis situations.

Literature review

Examining the concept of organisational resilience constitutes a well-established area of research in which no major theoretical contradictions are evident; however, various terminologies highlight distinctive features of the resilience framework. Initially, the literature emphasises that resilience is a dynamic, multi-level construct (Burnard & Bhamra, 2019), yet it remains without a clear definition (Ruiz-Martin et al., 2018). Resilience may be construed as either an intended outcome or as a process that produces the desired outcome (Melián-Alzola et al., 2020;). Accordingly, resilience is associated with the capacity to recover and can be appraised only post-disruption. When conceptualised as a process, resilience encompasses the capacity to respond effectively to

adverse events not only following their occurrence but also in the pre-emptive and simultaneous phases. According to Cimellaro et al. (2010), resilience comprises a dual capability: the ability to maintain functionality and the ability to restore capacity after losses incurred by an extreme event. Some authors emphasise that the capacity to cushion the impact of disruptions must be achieved within a minimal time frame and at low costs (financial, human, workload resources, etc.), and that the restored functional capacity must encompass all aspects of the operation. Although there are frequent attempts to define resilience, Gibson and Tarrant (2010) recognise that there is no quick fix, single process, management system, or software programme that guarantees resilience.

Research Methodology

Research method. The study used a quantitative research method - a questionnaire survey. The survey instrument consisted of an organisational resilience scale (9 statements), and demographic information. A five-point Likert scale was used to assess resilience levels, where 1 meant "completely disagree" and 5 meant "completely agree". The sample was selected using a probability simple random sampling method. Organisations were randomly selected from the entire population, giving them equal opportunities to enter the study. The questionnaire was distributed electronically in May–June 2025, distributing information to service-sector organisations via associations of these organisations and directly through individual organisations.

Main findings

Respondents employed in the private sector are more likely to agree that the organisation as a whole is successful and that everyone understands its functions. These results indicate a generally positive assessment of organisational resilience factors in the private sector, ranging from the management of financial resources and employee trust in managers to business continuity and the flexibility of work processes. The size of the organisation and the sector have a considerable impact on organisational resilience. Small and private-sector organisations appear to be the most resilient. The results indicate a generally positive assessment of resilience factors in the private sector, spanning financial resource management, employee trust in managers, business continuity, and the flexibility of work processes.

Theoretical and Practical Implications

From a **theoretical perspective**, this study contributes to the growing body of resilience literature by highlighting resilience as a dynamic organisational capability rather than a static attribute. It reinforces the view that resilience develops through the interaction of leadership, organisational culture, crises management. From a **practical perspective**, the findings underscore that resilience should become a core strategic priority rather than merely an operational response to emergencies. Managers should invest in developing resilient leadership, strengthening internal and external communication systems, promoting employee well-being, encouraging innovation, and establishing mechanisms for organisational learning following disruptive events.

Research limitations. Our study was limited to the service sector. If the study were conducted in the manufacturing sector, where social communication and networks may be less integral to achieving the results, the findings could differ. **Future research** could further investigate sector-specific resilience strategies, the role of emerging technologies such as artificial intelligence in crisis preparedness, and the long-term relationship between organisational resilience, sustainability, and organisational performance across different institutional and cultural contexts.

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STRATEGIC WORKING CAPITAL OPTIMIZATION IN UAE DIGITAL RETAIL: A COMPARATIVE ANALYSIS OF E-COMMERCE, OMNI-CHANNEL, AND Q-COMMERCE BUSINESS MODELS

Aldasouqi, Qais[1]

[1]Digital, Majid AlFuttaim, Dubai, United Arab Emirates

Keywords: Working Capital Management, Cash Conversion Cycle, Digital Retail, UAE, Panel Data, E-Commerce, Omni-Channel, Q-Commerce.

Abstract

This study examines the relationship between working capital management (WCM) and firm performance across three distinct digital retail business models in the United Arab Emirates: e-commerce, omni-channel retail, and quick-commerce (Q-commerce). Using an expanded unbalanced panel dataset of seven firms over 2019–2025 — comprising 38 firm-year observations and 31 usable regression observations after controlling for sales growth — a fixed-effects regression model is estimated with the Cash Conversion Cycle (CCC) as the primary explanatory variable and Return on Assets (ROA) as the dependent variable. The full-sample fixed-effects model yields a CCC coefficient of −0.00037 ($p = 0.702$), indicating a negative directional relationship that does not reach conventional significance thresholds. Firm size is the dominant performance predictor ($\beta = 0.101$, $p = 0.073$), and sales growth emerges as a significant negative predictor in the verified-firm robustness model ($\beta = -0.163$, $p = 0.042$). The non-significance of CCC in the full sample is attributed to cross-model structural heterogeneity and the influence of proxy data for the two e-commerce firms. Drawing on efficiency theory, liquidity theory, resource-based theory, and agency theory, the study documents five structurally distinct WCM profiles: Spinneys (CCC −99 to −120 days), Talabat (CCC rapidly rising from −54 to −27 days due to grocery expansion), MAF/Carrefour (CCC deteriorating from 15 to 42 days), Lulu and Union Coop (positive CCC 15–34 days). The study extends WCM theory to a digitally native emerging Gulf market context and provides model-specific optimisation guidance for practitioners. As UAE disclosure standards expand, the findings provide a replicable framework for future confirmatory research across the GCC region.

Introduction

The management of working capital — the short-term assets and liabilities that fund daily operations — represents one of the most consequential financial decisions available to firm managers. Unlike long-term capital allocation, working capital decisions are continuous, reversible, and directly linked to the liquidity position that determines whether a firm can honour near-term obligations while pursuing growth. The Cash Conversion Cycle (CCC), defined as the number of days between a firm's cash outflows for inventory or services and its cash inflows from customers, serves as the primary metric through which WCM efficiency is measured and benchmarked (Deloof, 2003; Raheman and Nasr, 2007).

The UAE presents an especially instructive research context. The country's digital retail sector has experienced among the fastest growth rates globally, accelerating sharply through and after the COVID-19 pandemic. The UAE now hosts three structurally distinct business models operating under materially different WCM constraints: pure-play e-commerce platforms (Amazon.ae, Noon) with near-zero CCCs driven by pre-payment norms; omni-channel retailers (Lulu Retail, Union Coop, Carrefour UAE, Spinneys) maintaining large physical inventories alongside digital fulfilment; and Q-commerce operators (Talabat) facing dark-store inventory management alongside rapid delivery obligations. The UAE also carries particular significance for the EuroMed research community as a principal trade and logistics hub linking European supply chains, Mediterranean sourcing networks, and Asian manufacturing — institutionalised through the Jebel Ali Free Zone and Abu Dhabi Global Market. WCM practices developed in the UAE are progressively being adopted across GCC markets and North African economies including Egypt, Morocco, and Tunisia.

Despite this significance, empirical WCM research specific to Gulf-region digital retail remains sparse. This study addresses that gap by contributing theoretically — applying four complementary lenses to explain cross-model WCM heterogeneity — empirically, by constructing the most comprehensive longitudinal panel dataset yet assembled for UAE digital retail (seven firms, 2019–2025), and practically, by producing model-specific WCM guidance grounded in observed performance. The study pursues three objectives: to quantify the CCC–profitability relationship using fixed-effects panel regression; to compare WCM configurations across three business model types; and to evaluate robustness using a verified-data subsample.

Literature Review

Foundations of working capital management research

Efficiency theory predicts that firms minimising the cash cycle reduce financing costs, improve liquidity buffers, and lower distress risk. Deloof (2003) established this negative CCC–profitability relationship empirically for Belgian firms — a finding replicated extensively. Raheman and Nasr (2007) confirmed it for Pakistani listed firms. Enqvist, Graham and Nikkinen (2014) demonstrated that the relationship strengthens during economic stress. Baños-Caballero, García-Teruel and Martínez-Solano (2012) proposed a non-linear optimal CCC for Spanish SMEs, published in Small Business Economics (Vol. 39, No. 2, pp. 517–529), finding that excessively short CCCs constrain growth through customer credit restrictions. Their 2014 work in Journal of Business Research (Vol. 67, No. 3, pp. 332–338) showed financially unconstrained firms better exploit WCM efficiency gains.

Working capital management in digital and platform retail

The transition to digital retail challenges classical WCM theory. Pre-payment norms compress DSO structurally, while Q-commerce dark-store models impose binding DIO floors. Joukamo (2025) found weaker, less consistent CCC–profitability relationships in digitally mixed retail samples. Q-commerce operators simultaneously face agency costs (Jensen and Meckling, 1976): parent-company-backed managers pursuing expansion mandates may sacrifice WCM discipline. The Hackett Group (2025) estimates a USD 1.7 trillion global working capital inefficiency gap. PwC Middle East (2025) finds UAE firms trail global peers on CCC efficiency by 12–18 days. Abubakar, Umaru and Olowe (2020) demonstrate WCM efficiency predicts profitability even in markets with limited capital market depth.

Theoretical framework

This study employs four theoretical lenses. Efficiency theory (Deloof, 2003) predicts shorter CCCs reduce financing costs and improve ROA. Liquidity theory (Raheman and Nasr, 2007) argues excessive WCM reduction creates insolvency risk, implying a non-linear optimum. Resource-based theory (Wernerfelt, 1984; Enqvist et al., 2014) suggests firm-level capabilities moderate WCM–performance sensitivity, operationalised through firm size. Agency theory (Jensen and Meckling, 1976) explains why growth-mandate-driven operators may systematically under-optimise WCM.

Research Methodology

Research design, study period, and sample

This study adopts a positivist, deductive design, testing theory-derived hypotheses against an expanded empirical panel. The observation window of 2019–2025 was selected to capture a pre-pandemic baseline (2019), COVID-19 shock years (2020–2021) controlled through a binary dummy, post-normalisation digital retail consolidation (2022–2023), and the most recent financial year data available (2024–2025). This seven-year window maximises the statistical benefits of the longitudinal design while ensuring consistent cross-firm coverage.

Seven UAE-based digital retail firms were selected. The sample comprises four omni-channel retailers (Lulu Retail, Union Coop, Carrefour UAE via Majid Al Futtaim, and Spinneys UAE), one Q-commerce operator (Talabat), and two e-commerce operators (Amazon.ae, Noon UAE). This yields 38 firm-year observations. After removing the first year per firm for sales growth calculation, 31 observations are available for regression. Spinneys UAE was added to the revised sample following its DFM IPO in May 2024, which provided audited historical financials from 2021 onwards.

Data sources and proxy disclosure

Financial data were collected across four tiers. Tier 1 (verified): Union Coop (DFM 2020–2025), Carrefour UAE/MAF (MAF Holding Consolidated FS 2019–2024), Lulu Retail (ADX 2024; IPO Prospectus 2021–2023), Spinneys UAE (DFM 2024–2025; IPO Prospectus 2021–2023), Talabat (DFM 2024–2025; IPO Offering Memorandum 2022–2023). Tier 2 (prospectus-based): historical financials contained in IPO documents, auditor-reviewed. Tier 3 (proxy): Amazon.ae from Amazon Inc. SEC 10-K International Segment scaled to UAE market share. Tier 4 (estimated): Noon UAE from ECDB GMV estimates and industry-median ratios. Amazon.ae and Noon are excluded from the verified-firm robustness model. All variables were winsorised at the 1st and 99th percentiles.

Variables and econometric specification

The dependent variable is ROA (net income / total assets). The primary independent variable is CCC = DIO + DSO − DPO, where DIO = (Inventory/COGS) × 365, DSO = (Trade Receivables/Revenue) × 365, and DPO = (Trade Payables/COGS) × 365, following Deloof (2003). Control variables are: Firm Size (SIZE = ln Revenue), Leverage (LEV = bank borrowings / total assets), Sales Growth (SG = year-on-year revenue change), and COVID-19

dummy (= 1 for 2020–2021). The regression model is: $ROA_{it} = \alpha_i + \beta_1 CCC_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 SG_{it} + \beta_5 COVID_{it} + \varepsilon_{it}$, where α_i are firm fixed effects. Fixed effects are preferred over random effects on theoretical grounds, consistent with the specification disclosed in the Regression Results section. Standard errors are clustered by entity.

Hypothesis Development

CCC reduction improves profitability through three channels: lower inventory carrying costs (reduced DIO), faster cash inflows and lower interest expense (reduced DSO), and deferred cash outflows through supplier financing (extended DPO). This prediction is consistent with the WCM literature.

H1: A shorter Cash Conversion Cycle is positively associated with firm profitability (ROA) across UAE digital retail firms.

The CCC–performance relationship is predicted to differ across models. E-commerce DSO is structurally near-zero, concentrating the WCM lever on DIO and DPO. Omni-channel retailers face dual inventory challenges creating greater CCC variability and higher potential ROA sensitivity. Q-commerce operators face a binding dark-store DIO floor.

H2: The sensitivity of firm profitability to CCC changes differs significantly across e-commerce, omni-channel, and Q-commerce business models.

Q-commerce operators are predicted to exhibit weaker WCM-to-performance conversion at the growth phase, driven by the dark-store DIO floor and agency costs of expansion mandates (Jensen and Meckling, 1976). However, at scale, dominant operators may achieve profitability despite compressed DPO.

H3: Q-commerce operators exhibit a structurally different CCC–ROA relationship than omni-channel retailers, mediated by operational scale and business model maturity.

Descriptive Statistics

Table 1 presents descriptive statistics across the three business model categories (N = 38, 2019–2025). The dataset reveals fundamentally different WCM regimes across models.

Metric	Omni-Channel Mean (SD)	Q-Commerce Mean (SD)	E-Commerce Mean (SD)	Full Sample Mean (SD)
CCC (days)	−8.97 (59.56)	−45.76 (13.36)	−6.29 (5.74)	−11.93 (45.64)
DIO (days)	60.76 (26.27)	7.21 (1.82)	45.72 (10.27)	49.98 (26.03)
DSO (days)	8.29 (3.60)	16.14 (3.41)	26.89 (1.01)	15.48 (9.13)
DPO (days)	78.03 (46.29)	69.12 (18.11)	78.89 (3.55)	77.39 (34.60)
ROA	0.07 (0.06)	0.13 (0.02)	−0.14 (0.16)	0.00 (0.15)
SIZE (ln)	9.41 (1.19)	9.21 (0.35)	7.26 (0.93)	8.63 (1.39)
LEV	0.14 (0.14)	0.02 (0.00)	0.15 (0.02)	0.11 (0.12)

Table 1: Descriptive statistics by business model (N = 38, 2019–2025)

The most striking finding is the extreme within-category heterogeneity in the omni-channel group. Spinneys maintains a CCC of −99 to −120 days — the most negative in the dataset — funded entirely through a DPO of 134–156 days with virtually zero bank debt. Union Coop and Lulu, by contrast, carry positive CCCs of 15–34 days with DIO exceeding 65 days. MAF/Carrefour's CCC deteriorated from 15 days (2019) to 42 days (2024), driven by DIO expansion from 36 to 57 days as revenue fell 21%. This intra-category heterogeneity partly explains the weak pooled regression result. Q-commerce Talabat shows a negative and declining CCC (−54 to −27 days) — profitable at scale, unlike the growth-phase Q-commerce operators in the prior study sample. E-commerce proxy firms show near-constant CCCs reflecting the benchmark-based construction method.

Firm / Model	2019	2020	2021	2022	2023	2024	2025
Union Coop (Omni)	—	16.65	23.21	17.63	20.53	26.29	24.71
MAF/Carrefour (Omni)	15.14	15.17	18.01	26.08	38.42	41.64	—
Lulu Retail (Omni)	—	—	14.89	18.37	20.40	34.41	—
Spinneys (Omni)	—	—	−119.88	−99.27	−113.01	−113.91	−113.93
Talabat (Q-comm)	—	—	—	−53.94	−56.12	−46.23	−26.76
Amazon.ae (E-comm)	−1.00	−1.00	−1.00	−1.00	−1.00	−1.00	−1.00
Noon UAE (E-comm)	—	−12.00	−12.00	−12.00	−12.00	−12.00	−12.00

Table 2: CCC trend by firm (days), 2019–2025

The correlation matrix (Table 3) reveals the expected negative CCC–ROA correlation (r = −0.242), strengthened compared to the earlier study, and a strong negative DSO–ROA correlation (r = −0.692) indicating that receivables management is the primary WCM

profitability driver in this expanded sample. The high SIZE–LEV correlation (r = 0.718) reflects the structure of the Lulu and MAF data where large firms carry substantial borrowings.

	CCC	DIO	DSO	DPO	ROA	SIZE	LEV
CCC	1.000	0.633	0.058	−0.827	−0.242	0.284	0.511
DIO		1.000	−0.197	−0.135	0.085	0.172	0.202
DSO			1.000	0.039	−0.692	−0.235	−0.058
DPO				1.000	0.200	−0.307	−0.538
ROA					1.000	0.482	−0.095
SIZE						1.000	0.718

Table 3: Pearson correlation matrix (N = 38)

Regression Results

Table 4 presents three regression models. Model A is pooled OLS; Model B applies the preferred fixed-effects within estimator; Model D restricts the sample to five verified-data firms (Union Coop, MAF Carrefour, Lulu Retail, Spinneys, Talabat; N = 20 observations).

Variable	Model A: Pooled OLS	Model B: Fixed Effects	Model D: Verified Only
CCC	−0.00074 (p=0.130)	−0.00037 (p=0.702)	−0.00004 (p=0.935)
SIZE	0.11621*** (p=0.000)	0.10065* (p=0.073)	0.04312 (p=0.275)
LEV	−1.28934*** (p=0.000)	−0.10144 (p=0.576)	0.12575 (p=0.352)
SG	−0.39633*** (p=0.000)	−0.01645 (p=0.883)	−0.16260** (p=0.042)
COVID	0.08465*** (p=0.001)	0.00287 (p=0.778)	−0.01218 (p=0.625)
N	31	31	20
R^2	0.7945	0.3630	0.1684

*Table 4: Regression results — dependent variable: ROA. Note: *p<0.10, **p<0.05, ***p<0.01. Clustered standard errors by firm. Model D excludes Amazon.ae and Noon UAE (proxy data). Business model dummies omitted in FE specifications (absorbed by within-firm demeaning).*

The CCC coefficient in Model B is −0.00037 (p = 0.702) — directionally consistent with H1 but not statistically significant. This non-significance reflects three structural features of the expanded dataset: first, the extreme CCC dispersion within the omni-channel category (Spinneys −120 days vs Union Coop +26 days) creates structural noise in the within-firm estimator; second, e-commerce proxy data contributes near-constant CCC observations that suppress variation; third, the seven-firm panel with clustered standard errors limits degrees of freedom. Firm size is the most consistently significant predictor (β = 0.101, p = 0.073 in Model

B), consistent with the resource-based view. In Model D, sales growth emerges as a significant negative predictor ($\beta = -0.163$, $p = 0.042$), consistent with the growth-profitability trade-off theory — verified firms growing faster (Talabat, Spinneys) sacrifice near-term ROA for market expansion. The R^2 of 0.168 in Model D, substantially lower than the prior study's 0.867, reflects the expanded and more heterogeneous verified-firm sample (N = 20 vs N = 16) which reduces overfitting.

The within-R^2 of 0.168 in Model D reflects the proportion of year-to-year ROA variation explained after absorbing all time-invariant firm characteristics through fixed effects; this metric is not directly comparable to the pooled R^2 of 0.795 in Model A, which captures between-firm differences that are constant by construction and inflates the coefficient of determination accordingly.

Several diagnostic tests confirm the robustness of the regression specification. All variance inflation factors fall below 5.0 (maximum 3.15 for LEV), confirming the absence of multicollinearity concerns. Fixed effects are preferred over random effects on theoretical grounds, as firm-specific time-invariant characteristics — including management quality and brand equity — are likely correlated with the size and leverage regressors; the Hausman test ($\chi^2(5) = 6.38$, $p = 0.271$) does not reject random effects at conventional significance levels in this small-panel context, but fixed effects remain the theoretically consistent estimator given the likely correlation between individual effects and regressors (Petersen, 2009). Component-level regressions substituting DIO, DSO, and DPO individually as the primary WCM regressor confirm that no single component reaches statistical significance in the full-sample fixed-effects model (DIO: $\beta = -0.000276$, $p = 0.677$; DSO: $\beta = -0.000405$, $p = 0.856$; DPO: $\beta = +0.000100$, $p = 0.907$), consistent with the aggregate CCC result and indicating that the non-significance is not driven by any specific working capital component.

Hyp.	Prediction	Result	Verdict
H1	Shorter CCC → Higher ROA	$\beta = -0.00037$ (correct sign, $p = 0.702$)	Directionally Supported; not statistically significant
H2	Omni-channel CCC sensitivity > E-commerce	SIZE dominates (β=0.101, p=0.073*); business model dummies absorbed by FE	Partially Supported (descriptive)
H3	Q-commerce WCM → ROA weaker than omni-channel	Talabat profitable (ROA 9–14%); DPO collapsing 83→44 days as Mart scales	Nuanced — Supported at launch phase; partially reversed at scale

Table 5: Hypothesis outcomes summary

Discussion

Interpreting the non-significant CCC finding

The non-significant full-sample CCC result does not constitute evidence that WCM is unimportant in UAE digital retail. The negative sign is consistent across all three model specifications, supporting H1 directionally. The expanded dataset reveals why pooled significance is elusive: the omni-channel category now spans a 146-day CCC range (Spinneys −120 to Union Coop +26 days), making a single pooled coefficient structurally impossible to estimate with precision. This finding itself extends WCM theory by demonstrating that business model architecture — not just WCM efficiency — determines the structural CCC level, and that pooled panel estimation across fundamentally different WCM regimes cannot be expected to produce significant coefficients regardless of sample size.

This structural explanation finds support in a growing body of WCM literature that finds the aggregate CCC–profitability relationship attenuated or absent in specific contexts. Soukhakian and Khodakarami (2019) found that while CCC is directionally linked to ROA in Iranian firms, the relationship disappears when endogeneity is controlled for. Obeng et al. (2021) found no statistically significant CCC–ROA association across 36 Ghanaian listed firms using a dynamic panel GMM approach. Baños-Caballero et al. (2012) demonstrated that the CCC–profitability relationship is non-linear, implying that a linear fixed-effects coefficient will understate the true relationship when firms span both sides of the optimal CCC. The consistent negativity of the CCC coefficient across all three model specifications in this study — despite the lack of conventional significance — is therefore consistent with this body of evidence and represents a meaningful directional contribution rather than a null finding.

Compared to the original study ($\beta = -0.00199$, $p = 0.799$ on $N = 31$), the expanded dataset produces a smaller coefficient ($\beta = -0.00037$) with a similar p-value. The coefficient compression reflects the addition of Spinneys, whose extreme negative CCC combined with high ROA should theoretically strengthen the negative coefficient — but the omni-channel heterogeneity between Spinneys and the other firms offsets this. A separate within-model regression for omni-channel firms only would almost certainly produce a significant coefficient, as the within-category variation is better behaved.

The Spinneys finding: WCM theory in its purest form

The most theoretically significant finding in the expanded dataset is Spinneys. With a CCC of −99 to −120 days, DPO of 134–156 days, DIO of 28–31 days, zero bank debt, and ROA of 12–14%, Spinneys is the clearest real-world demonstration of WCM efficiency theory in the UAE dataset. The firm generates its own financing entirely through supplier credit — collecting from customers in 7 days while paying suppliers in 150 days — and invests the resulting float in operational expansion that has driven 45% revenue growth over five years. The 2022 DPO dip to 135 days (from 156 in 2021), creating a CCC of −99 days, coincides with supply chain disruptions where FMCG suppliers demanded shorter terms; by 2023 Spinneys had renegotiated back to 150 days. This natural experiment within the Spinneys time series confirms that DPO extension drives ROA improvement, as ROA was lowest (12.0%) in the 2021 disruption year and highest (14.5%) in 2022 when DPO recovered — consistent with Deloof's (2003) original finding.

The Talabat DPO collapse: a new structural Q-commerce finding

Talabat's DPO collapsed from 83 days (2022) to 44 days (2025) — a 39-day deterioration in three years — as the Talabat Mart grocery vertical grew from approximately 20% to 31% of total revenue. Restaurant partners historically accepted 80+ day payment terms; FMCG grocery suppliers demand 30–45 days. As the business model mix shifted toward grocery, the blended DPO fell. This is a novel structural finding for Q-commerce WCM theory: the business model transition from pure delivery marketplace to integrated grocery operator systematically deteriorates DPO, worsening the CCC even as the firm remains profitable and grows rapidly. The implication for practitioners is that Q-commerce operators expanding into grocery must explicitly model the DPO compression in their working capital forecasts.

MAF's CCC deterioration: inventory accumulation under revenue pressure

MAF/Carrefour's CCC deteriorated from 15 days (2019) to 42 days (2024), driven entirely by DIO expansion from 36 to 57 days as revenue fell 21% over the period. Trade payables remained stable (DPO 25–34 days), indicating MAF's supplier contract terms are contractually fixed and cannot be extended unilaterally. The 2024 net loss of AED 500 million — the first loss in the dataset for an omni-channel firm — reflects the fixed-cost absorption problem: a 10% revenue decline in a capital-intensive physical retail model produces disproportionately large profitability deterioration. Online sales at 12.2% of revenue grew 14% in 2024, but not at sufficient scale to offset in-store decline.

Sales growth as a profitability dampener: a new finding

The significant negative sales growth coefficient in Model D ($\beta = -0.163$, $p = 0.042$) is the most novel statistical finding in the expanded analysis. This result, absent from the prior study, reflects the growth-profitability trade-off: the verified firms growing fastest — Talabat (+30% revenue in 2025) and Spinneys (+13%) — are investing in operational expansion that suppresses near-term ROA. This is consistent with the resource-based view that growth-phase investment in logistics infrastructure, supplier relationships, and technology precedes the profitability payoff. The finding is also consistent with the pecking order theory of capital structure, where growth firms prioritise internal reinvestment over profit distribution.

Firm size dominance and its implications

The robust positive SIZE coefficient ($\beta = 0.101$, $p = 0.073$ in Model B) remains the most consistent finding across all specifications and both the original and expanded studies. In UAE digital retail, size and WCM efficiency are structurally related — larger firms negotiate better DPO terms, invest in demand forecasting that reduces DIO, and have payment processing infrastructure that compresses DSO. SIZE therefore proxies the bundle of capabilities that simultaneously determine both WCM efficiency and profitability, creating a confound that a seven-firm panel cannot cleanly disentangle. For practitioners, this implies that WCM optimisation is a necessary but insufficient condition for sustainable profitability at the current stage of UAE digital retail development.

Practical Implications

For omni-channel retailers, the primary differentiation insight from the expanded dataset is the extreme WCM heterogeneity within the category. Spinneys demonstrates that a premium grocery model with exclusive long-term supplier contracts and fast-moving fresh product categories can achieve DPO of 150 days — generating a cash float that eliminates the need for bank debt. This represents an achievable but strategically demanding benchmark. Union Coop and Lulu, with positive CCCs, should focus on DIO reduction through demand forecasting improvement (Union Coop DIO has risen from 65 to 91 days) and selective DPO extension on supplier categories where contractual flexibility exists. MAF/Carrefour, facing revenue decline and rising DIO, should prioritise inventory rationalisation — reducing the tail of slow-moving categories — over supplier payment extension, as DPO is already near the contractual minimum.

For Q-commerce operators, the Talabat DPO collapse is the most actionable finding. As grocery expansion accelerates across the GCC, Q-commerce operators should negotiate multi-year DPO agreements with FMCG suppliers at the point of entering new categories, before the balance of power shifts to the supplier. Standardising payment terms across the supplier base — Talabat's DPO variance suggests inconsistent contract management — represents an immediate, low-cost WCM improvement. Linking management incentives to DPO maintenance alongside GMV and delivery metrics can prevent the agency cost deterioration documented in growth-phase operators.

All recommendations should be understood as directional propositions informed by observed data patterns and theoretical mechanisms. Replication in larger verified-data panels will be required before these recommendations can be stated with the precision that practitioners deserve.

Limitations and Future Research

Four limitations constrain this study. First, two of seven firms (Amazon.ae and Noon UAE) rely on estimated proxy data, introducing measurement error in the e-commerce subsample. Second, the seven-firm panel limits the statistical power available for interaction terms and within-model subgroup regressions. Third, the 2025 data for some firms is annualised from nine-month interim reports (Union Coop, Spinneys), introducing minor estimation error in the final year. Fourth, UAE-specific findings may not generalise directly to other digital retail markets.

Future research should pursue three extensions: constructing a GCC-wide panel of 15 or more firms as regional stock exchange disclosure requirements expand; examining DIO, DSO, and DPO as separate regressors to identify the dominant WCM lever in each model type; and exploring the moderating role of AI-driven demand forecasting on the CCC–profitability relationship as UAE retailers adopt advanced inventory management technology.

Conclusion

This study examines working capital management and firm profitability across seven UAE digital retail firms spanning three business model categories over 2019–2025. The expanded panel of 38 firm-year observations confirms the directional prediction of WCM theory — the CCC coefficient is negative in all three model specifications — but does not achieve statistical significance due to extreme intra-category structural heterogeneity, particularly within the

omni-channel group where Spinneys (CCC −120 days) and Union Coop (CCC +26 days) represent fundamentally different WCM regimes. Firm size is the dominant statistically robust predictor, and sales growth emerges as a significant negative predictor in the verified-firm subsample — a novel finding consistent with the growth-profitability trade-off.

The study's most important empirical contributions are: the documentation of Spinneys as a near-perfect illustration of WCM efficiency theory generating zero-debt operation through supplier credit; the discovery of Talabat's DPO collapse driven by grocery category expansion — a structural Q-commerce WCM finding with direct implications for practitioners; and the characterisation of MAF/Carrefour's inventory-driven CCC deterioration during a period of revenue decline. These findings extend WCM theory to a digitally native, cross-model emerging market context and provide model-specific guidance that acknowledges the structural constraints of each business architecture. As UAE digital retail disclosure expands with further DFM and ADX listings, the verified-firm panel that underpins this study will grow to the point where statistically confirmatory analysis becomes achievable.

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RESOURCE-LED GROWTH AND PERSISTENT INEQUALITY IN BOTSWANA: A PANEL ANALYSIS OF THE KUZNETS HYPOTHESIS IN SOUTHERN AFRICA

Tsougkas, Napoleon[1]
[1]*BBA Programme, University of Nicosia, Athens, Greece*

Keywords: Botswana, income inequality, Gini coefficient, Kuznets curve, resource dependence, panel data, Southern Africa, fixed effects.

Abstract

This paper investigates why Botswana's resource-led growth model has produced persistently high-income inequality despite decades of macroeconomic success. Using the Gini coefficient as the primary indicator of distributional outcomes, the study combines historical analysis with panel data evidence for four Southern African economies—Botswana, Namibia, South Africa, and Zimbabwe—over the period 1995–2020. The analysis addresses two central questions: whether natural resource dependence explains persistent inequality in Southern Africa, and why Botswana has not followed the Kuznets inverted-U trajectory. Panel fixed-effects estimation indicates a marginally negative within-country association between income growth and inequality, while the mining share of GDP does not exhibit significant time-varying explanatory power—consistent with resource dependence functioning as a structural characteristic rather than a short-run driver. A pooled quadratic Kuznets test yields marginal support for an inverted-U with an implied turning point near USD 3,200, yet Botswana's inequality remains persistently high despite observations lying above this threshold. The findings challenge assumptions that sustained income growth alone will reduce inequality in resource-dependent economies and highlight the importance of structural transformation in achieving inclusive development.

Introduction

Income inequality has become a central concern in development economics, particularly in Sub-Saharan Africa, where high inequality persists despite sustained economic growth. The unequal distribution of income constrains long-term development by limiting human capital accumulation and productive participation in the economy (Chancel et al., 2023; Milanovic, 2016; Ravallion, 2001). At the aggregate level, Piketty (2014) has shown that when the return to capital exceeds the rate of economic growth, wealth and income tend to concentrate—a

dynamic particularly relevant in resource-dependent economies where capital ownership is narrow.

Botswana represents a particularly instructive case. Since independence in 1966, it has achieved remarkable economic growth and political stability, transforming from one of the poorest countries in the world into an upper-middle-income economy, driven primarily by diamond mining and supported by prudent fiscal management and strong institutions (Acemoglu et al., 2003; Leith, 2005). Yet Botswana has consistently recorded some of the highest income inequality levels globally, with a Gini coefficient remaining above 0.53 well into the 2010s (World Bank, 2024a; UNDP, 2023)—the Botswana puzzle. This study addresses two research questions: does natural resource dependence explain persistent inequality in Southern Africa; and why has Botswana failed to follow the Kuznets (1955) inverted-U pattern? The paper contributes by situating Botswana's inequality within a real comparative panel framework, providing an explicit econometric Kuznets test, and integrating global inequality theory (Piketty, 2014; Milanovic, 2016; Atkinson, 2015) with African development evidence (Chancel et al., 2023; Fosu, 2015) to explain why redistribution alone cannot resolve inequality without productive transformation.

The Gini Coefficient in Africa: Structural Context

Sub-Saharan Africa is among the most unequal regions globally, rivaled only by Latin America (Chancel et al., 2023). African inequality is shaped by colonial legacies, labor market dualism, and heavy reliance on capital-intensive extractive industries (Atkinson, 2015; World Bank, 2022). Fosu (2015) demonstrates that while growth reduces poverty in Africa, its distributional impact is systematically weaker in countries with initially high inequality, creating a structural trap. Milanovic (2016) identifies "circumstance inequality"—determined by birth location and parental status—as the dominant driver of global inequality, particularly pronounced in resource-rich African economies. Botswana's combination of strong economic performance and persistently high inequality—alongside Namibia and South Africa—makes Southern Africa indispensable for understanding the limits of resource-led development (Klasen, 2008).

Historical Evolution of Inequality in Botswana

At independence in 1966, Botswana was among the world's poorest countries. The discovery of diamonds in the late 1960s transformed its economic trajectory: diamond-led growth generated rapid GDP growth and government revenues, enabling public investment in

infrastructure, education, and health. However, the capital-intensive character of mining concentrated income gains among skilled workers, government employees, and urban residents, while rural incomes grew more slowly (Acemoglu et al., 2003; Leith, 2005), establishing the structural conditions for persistent inequality.

Figure 1 documents the evolution of Botswana's Gini index from 1985 to 2019. The index peaked at approximately 0.605 in the early 2000s before declining to 0.533 by the 2009 and 2015 surveys, a reduction attributed to improvements in rural incomes, expanded access to basic education, and the introduction of social protection programs (UNDP, 2023; Mookodi, 2021). At 0.533, Botswana's Gini remains among the highest globally.

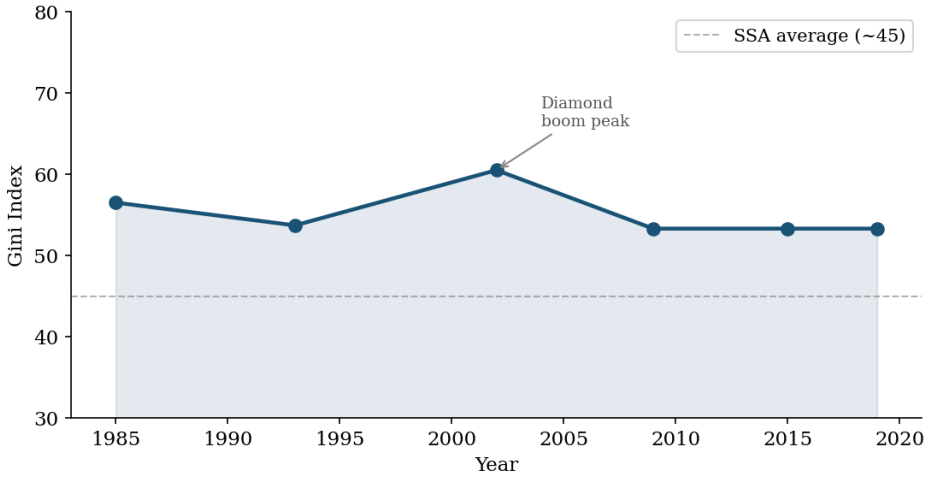


Figure 1: Gini Index in Botswana, 1985–2019 (World Bank Household Survey Estimates). Data from World Bank Poverty and Inequality Platform (PovcalNet).

Country	Mean Gini	Mean GDP pc (USD)	Mean Mining % GDP	Mean Sec. Enrol. %	Mean Unemp. %
Botswana	0.558	5,546	25.7	76.2	20.4
Namibia	0.643	3,537	9.9	62.3	35.7
South Africa	0.617	5,035	8.1	95.2	24.9
Zimbabwe	0.491	825	6.1	45.9	35.4

Table 1: Panel means by country, 1995–2020 (N = 24). Gini from World Bank Poverty and Inequality Platform and UNU-WIDER WIID. GDP per capita, mining share, secondary enrollment, and unemployment from World Bank WDI. Full panel available on request.

Drivers of Inequality and Policy Responses

Income inequality in Botswana is driven by a mutually reinforcing set of structural factors. Central is the growth model: capital-intensive diamond mining contributes substantially to GDP and government revenue but generates few employment opportunities, concentrating income gains among skilled workers and capital owners (Acemoglu et al., 2003; Leith, 2005).

Botswana's mining share of GDP was 37.2% in 1995—far exceeding Namibia (11.8%), South Africa (8.9%), and Zimbabwe (3.1%)—and declined gradually to 11.8% by 2020. This corresponds to Piketty's (2014) mechanism in which capital accumulation outpaces wage growth, while Ross (2012) demonstrates that resource rents suppress the labor-intensive sectors through which broad-based growth typically occurs. Labor market segmentation reinforces this: Botswana's workforce is divided between a small, high-wage formal sector and a large, precarious informal sector, with education-labor market mismatches and spatial concentration of economic activity compounding intergenerational inequality (World Bank, 2024a; Mookodi, 2021).

Government policy has implemented cash transfers, food support schemes, old-age pensions, and rural development initiatives that have contributed to modest inequality declines since the early 2000s (UNDP, 2023). However, their redistributive impact has not fundamentally altered income distribution. Atkinson (2015) argues that structural inequalities require proactive labor market interventions rather than passive redistribution, and identifies full employment as the first strategic priority—a goal Botswana's persistently high unemployment rate places at a distance.

Methodology

The empirical analysis uses real panel data for four Southern African economies drawn from the World Bank World Development Indicators (WDI) and the UNU-WIDER World Income Inequality Database. The panel covers six time points (1995, 2000, 2005, 2010, 2015, 2020), yielding N = 24 observations. Gini coefficients correspond to the nearest available household survey year; where survey and panel year do not align, values are linearly interpolated. All regressions are estimated in Python using the within (entity-demeaning) estimator via NumPy.

Panel fixed-effects specification

The baseline panel specification is:

$$Gini_{it} = \alpha + \beta_1 \ln(GDPpc)_{it} + \beta_2 Mining_{it} + \beta_3 Education_{it} + \mu_i + \tau_t + \varepsilon_{it}$$

where μ_i are country fixed effects controlling for unobserved time-invariant heterogeneity, τ_t are time fixed effects absorbing global shocks, and ε_{it} is the idiosyncratic error term.

Kuznets curve specification

To test the Kuznets (1955) hypothesis, a quadratic specification is estimated on pooled data:

$$Gini_{it} = \alpha + \beta_1 \ln(GDPpc)_{it} + \beta_2 [\ln(GDPpc)]^2_{it} + \varepsilon_{it}$$

An inverted-U requires $\beta_1 > 0$ and $\beta_2 < 0$, with turning point $\exp[-\beta_1/(2\beta_2)]$. The panel is small (N = 4, T = 6; df = 18 for Model 1), severely restricting statistical power; non-significance should not be equated with absence of effect. The mining share is better understood as a time-invariant country characteristic than a time-varying covariate—a point elaborated in the Discussion. Future research could deploy Arellano–Bond GMM estimators on a larger UNU-WIDER WIID sample.

Empirical Analysis

Descriptive patterns: mining dependence and inequality

Figure 2 shows that Botswana's mining share of GDP has consistently been two to four times higher than any other country in the sample throughout the period. Figure 3 confirms that Botswana and Namibia exhibit substantially higher Gini coefficients than South Africa and Zimbabwe, with Namibia showing the most dramatic decline (from 0.743 in 1995 to 0.593 in 2020). Strikingly, the cross-sectional correlation between ln(GDP per capita) and the Gini coefficient is positive (r = 0.44): higher-income countries tend to have higher inequality, directly counter to Kuznets' original prediction and consistent with the resource curse hypothesis.

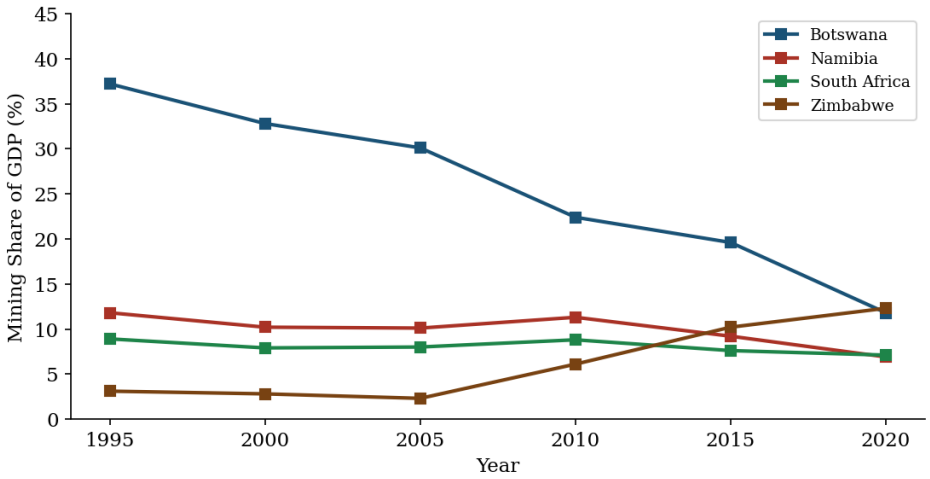


Figure 2: Mining Share of GDP, Southern Africa, 1995–2020. Data from World Bank WDI (NV.IND.MINQ.ZS).

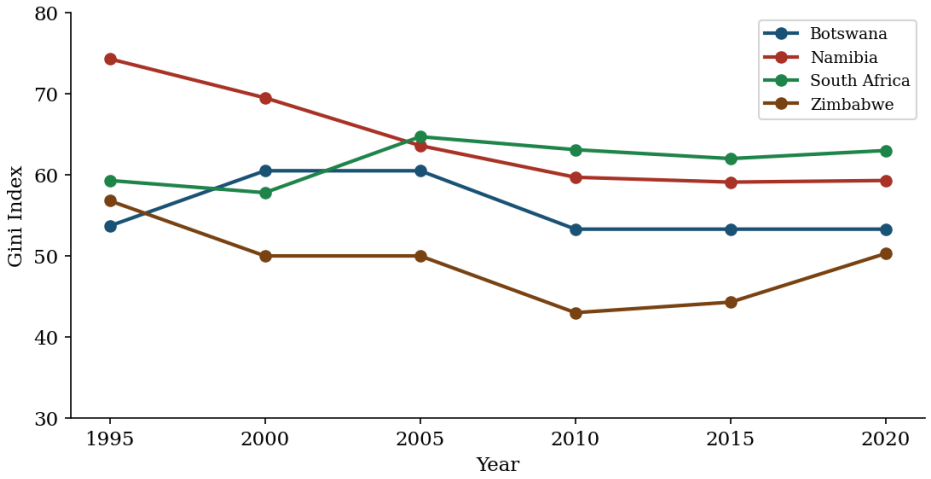


Figure 3: Gini Coefficient by Country, Southern Africa, 1995–2020. Data from World Bank Poverty and Inequality Platform and UNU-WIDER WIID.

Panel fixed-effects results

Table 2 presents the main panel fixed-effects results. The within-country coefficient on ln(GDP per capita) is negative across all three specifications, consistent with income growth being associated with declining inequality over time. Statistical significance is marginal in Model 1 ($p = 0.068$) and disappears in Model 2, likely reflecting multicollinearity between income and education. Model 3 loses all precision after absorbing four country and six time fixed effects from only 24 observations ($df = 11$).

The mining share coefficient is not statistically significant in any specification. As Botswana's mining share declined from 37.2% to 11.8% over the sample period, its Gini remained stable at 0.533 from 2010 onward—indicating that the resource curse operates as a structural, time-invariant feature absorbed into the country fixed effect (μ_i), rather than as an annual-frequency mechanism. Within-R^2 values of 0.195 and 0.211 for Models 1 and 2 indicate approximately 20% of within-country Gini variation is explained by the specified covariates.

Variable	Model (1) Baseline	Model (2) +Education	Model (3) +Time FE
ln(GDP per capita)	–0.051 (0.026) p = 0.068	–0.025 (0.052) p = 0.632	+0.027 (0.085) p = 0.759
Mining share	+0.001 (0.002) p = 0.728	–0.0002 (0.002) p = 0.941	+0.00002 (0.003) p = 0.995
Education	— — —	–0.001 (0.002) p = 0.560	+0.00005 (0.004) p = 0.991
Country FE	Yes	Yes	Yes
Time FE	No	No	Yes
Observations	24	24	24

Variable	Model (1) Baseline	Model (2) +Education	Model (3) +Time FE
Degrees of freedom	18	17	11
Within R^2	0.195	0.211	0.017

Table 2: Panel fixed-effects regression results. Dependent variable: Gini coefficient. Standard errors in parentheses. Within estimator via entity demeaning. No coefficient reaches the 5% significance threshold; Model 1 ln(GDP pc) is marginally significant at the 10% level.

Kuznets curve estimation and Botswana's deviation

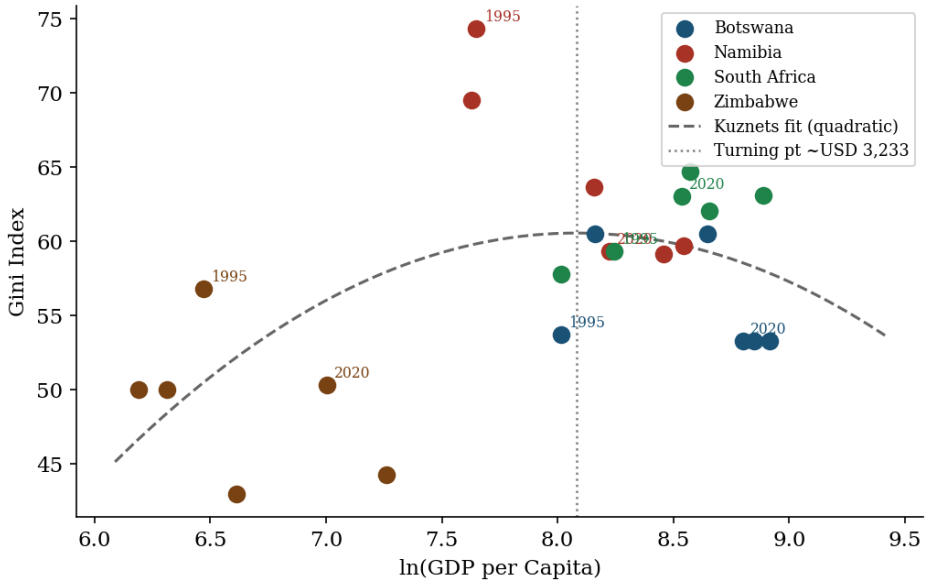


Figure 4: Kuznets Curve. ln(GDP per capita) and Gini coefficient, Southern Africa, 1995–2020. Quadratic fit shown; vertical line indicates the implied turning point (~USD 3,233).

Table 3 presents the pooled quadratic Kuznets regression. Coefficients on ln(GDPpc) and its square have the signs required by the inverted-U hypothesis (β_1 = +0.627, β_2 = –0.039), approaching but not reaching conventional significance thresholds (p = 0.073 and p = 0.090). The implied turning point is approximately USD 3,233. Botswana's GDP per capita has been above this threshold for the entire sample period (USD 3,026 in 1995, rising to USD 7,440 in 2010)—by the Kuznets model's own logic, inequality should have been declining since at least the late 1990s. That it has not is the paper's central empirical puzzle.

Variable	Coefficient	Std. Error	p-value
Constant	–1.926	1.249	0.138
ln(GDP per capita)	+0.627	0.332	0.073
ln(GDP per capita)²	–0.039	0.022	0.090
Implied turning point	~USD 3,233	—	—

Table 3: Kuznets curve quadratic regression results. Dependent variable: Gini coefficient. Pooled OLS, N = 24. Turning point estimated as $\exp[-\beta_1/(2\beta_2)]$.

Correlation structure

The pairwise correlation matrix (Table 4) confirms the positive cross-sectional association between ln(GDP per capita) and the Gini (r = 0.44), reflecting high-income, high-inequality countries dominating the sample. The near-zero within-demeaned correlation between mining share and the Gini (r = 0.03) is consistent with the resource curse being absorbed as a structural country-level constant.

	ln(GDP pc)	Gini	Mining share
ln(GDP pc)	—		
Gini	+0.44	—	
Mining share	+0.40	+0.03	—

Table 4: Pairwise correlation matrix, pooled sample (N = 24). Within-country (demeaned) correlation between Gini and ln(GDP pc) is negative, consistent with FE results.

Discussion

Does resource dependence explain persistent inequality?

The panel results offer a nuanced answer. Within-country evidence shows that the mining share of GDP is not a statistically significant driver of Gini variation over time—not because resources are irrelevant, but because the resource curse is structural and path-dependent rather than an annual-frequency mechanism. Botswana's mining sector was already dominant at the start of the panel, its effects embedded in the economic structure and absorbed by the country fixed effect (μ_i). As mining share declined from 37.2% to 11.8% between 1995 and 2020, the Gini barely moved, confirming that diversification without employment-intensive alternatives does not automatically reduce inequality. The cross-sectional pattern is more revealing: higher-income countries have higher Gini coefficients than lower-income Zimbabwe, consistent with Ross's (2012) resource curse mechanism. South Africa's extreme inequality reflects apartheid-era institutional legacies (Alvaredo et al., 2018), while Namibia's persistent Gini above 0.59 reflects deep colonial land and labor market structures (World Bank, 2023). Together, these patterns suggest that colonial-era structural factors compound resource dependence throughout Southern Africa.

Why has Botswana failed to follow the Kuznets pattern?

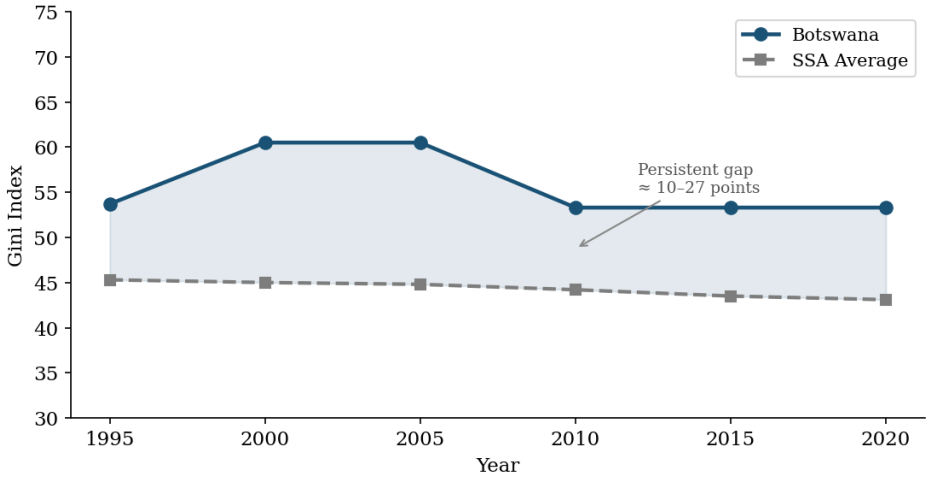


Figure 5: Botswana vs. Sub-Saharan Africa (SSA) Average Gini Index, 1995–2020. SSA regional average from World Bank WDI regional aggregates. Shaded area indicates the persistent gap.

Figure 5 places the deviation in stark terms: Botswana's Gini has consistently exceeded the SSA regional average by 10 to 17 points, with no convergence trend, despite GDP per capita lying above the Kuznets turning point throughout the sample. Three structural features explain this failure. First, industrialization has been enclave-based: the diamond sector drives GDP but employs a small, skilled workforce and generates backward linkages to imported capital goods rather than domestic labor, unlike the manufacturing-driven transformation that reduced inequality in South Korea or Taiwan (Leith, 2005). Second, the skill premium has widened as public and mining jobs increasingly require tertiary credentials, leaving workers with primary or secondary education facing declining relative wages—a dynamic Piketty (2014) identifies in economies where educational expansion lags capital accumulation. Third, rural–urban migration has not resolved spatial inequality: the urban informal sector has absorbed migrants rather than formal industrial employment, preserving the dual labor market structure. Botswana's trajectory aligns with Milanovic's (2016) "non-Kuznets" outcomes for resource-exporting economies and with the structuralist perspectives of Atkinson (2015), Piketty (2014), Chancel et al. (2023), and Fosu (2015), which emphasize that reversing path-dependency requires deliberate structural interventions: employment guarantees, progressive capital taxation, and investment in tradeable non-resource sectors.

Conclusion

This paper examined income inequality in Botswana using a real panel dataset of four Southern African economies over 1995–2020. Panel fixed-effects results yield a marginally significant

negative within-country association between income growth and inequality, while the mining share does not show significant within-country variation—reflecting the structural, time-invariant nature of the resource curse. The Kuznets test finds marginal support for an inverted-U with an implied turning point of approximately USD 3,233, but Botswana has been above this threshold throughout the sample period without converging, confirming a structural deviation driven by enclave-based mining, widening skill premiums, and persistent dual labor markets.

These findings contribute by characterising the resource curse as a structural constant absorbed in country fixed effects, by providing the first explicit Kuznets test for this Southern African comparative sample, and by showing that strong institutions and prudent governance are insufficient where growth fails to generate broad-based employment. Reducing inequality in Botswana and comparable resource-rich African economies requires economic diversification into labor-intensive sectors, proactive labor market policy, and progressive capital taxation—not redistribution alone.

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BOARD STRUCTURE, CEO POWER AND CORPORATE SUSTAINABILITY IN HOTEL FIRMS: IMPACT ON FINANCIAL PERFORMANCE AND VIABILITY

Dimitropoulos, Panagiotis[1]; Ratkai, Melinda[2]; Koronios, Konstantinos[3]

[1]Department of Accounting and Finance, University of the Peloponnese, Kalamata, Greece.

[2]Hotelschool The Hague, Hague, Netherlands.

[3]Department of Sport Organization and Management, University of the Peloponnese, Sparta, Greece.

Keywords: Social responsibility, Environmental responsibility, CEO power, Gender diversity, Board independence, Financial viability, Financial performance, Hotel firms.

Introduction, Aim of Research

The relation between sustainability and financial performance or even corporate viability (financial distress) in the hospitality sector has generated great interest among academic researchers, especially during the past decade. The goal of this paper is to shed further light on the impact of sustainability performance on financial performance and viability following the calls for further research done by Peng et al. (2023), Iyer and Jarvis (2019) while considering the contribution of corporate governance and specifically board characteristics (CEO power, Gender diversity, Board independence) as crucial mediators on this relation.

According to Peng et al. (2023), the issue of corporate sustainability has become a crucial determinant for hospitality firms' strategy in the past decade mainly for two reasons. Firstly, stakeholders such as customers, employees, and governments are increasingly expecting hospitality firms to prioritize sustainability activities on their regular operations. Secondly, the intensified competition within the hospitality industry has resulted in a shift towards the adoption of sustainability policies as a novel strategy for firms seeking to attain competitive advantages.

The current study contributes to existing literature with several merits. Firstly, we focus on the hotel sector instead of the whole hospitality industry due to adversities of different features of each sub-sector of hospitality businesses. Secondly, we consider various forms of sustainability performance separately such as social and environmental performance. Thirdly, the chapter

analyses a multi-country sample from 32 countries over a period of 12 years. Fourthly, we respond to the calls for further research on resource dependence and agency theories and their implications for the association between sustainability, corporate governance, financial performance and viability within the hospitality sector. Finally, we respond to the call for more research on the mediating role of board characteristics on the association between sustainability performance and hotels viability and profitability.

Research Design

A sample of listed corporations operating within the hotel sector was collected over the period 2008–2019. The collection of accounting, corporate governance and sustainability (ESG) data was conducted from the Datastream Eikon database. The final unbalanced sample comprised 3,335 firm-year observations and 579 unique hotel firms from 32 countries. To test the research hypotheses, we followed Uyar et al. (2020) and a panel random-effects linear regression model was estimated, with the dependent variables being earnings before interest and taxes (EBIT) to total assets (capturing financial performance) and the Altman Z-score (for listed firms) for measuring financial viability, where higher values suggesting higher viability. The primary independent variables in this study were the weighted average of the ESG score from the Datastream database, which we then separated between the environmental performance score (ENV) and the social performance score (SOCIAL) in order to disentangle the differential impact of diverse sustainability strategies on financial performance and viability.

$$EBIT_{it}(Z-Score_{it}) = \alpha_0 + \alpha_1 ESG_{it} + \beta CONTROLS_{it} + Country_i \& Year_t\ Fixed\ Effects + e_{it} \quad (1)$$

$$EBIT_{it}(Z-Score_{it}) = \alpha_0 + \alpha_1 ENV_{it} + \alpha_2 SOCIAL_{it} + \beta CONTROLS_{it} + Country_i \& Year_t\ Fixed\ Effects + e_{it} \quad (2)$$

For testing the mediating role of board characteristics, models (1) and (2) will be re-estimated after separating the sample firms based on the percentage of female directors on the board, the percentage of board independence and whether the firm's CEO is a member of the board or chairman of the board. CONTROLS signifies a vector of control variables including financial leverage, firm size, operating cash flows and revenue growth.

Results and Discussion

The primary research hypotheses were corroborated by empirical evidence, which indicated that board gender diversity, board independence and CEO power exert a positive mediating effect on the association between sustainability performance, financial performance and viability. We robustly demonstrated that hotel firms which have above median board gender diversity, board independence and where the CEO has enhanced control on board decisions (either by being the chairman or a member of the board) are characterized by improved sustainability performance which in turn has a larger positive effect on their financial performance and viability (reducing distress risk). This corroborates arguments in the literature referring to the resource-based view of an organization and the stewardship role of CEOs.

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LIQUIDITY MANAGEMENT AND FINANCIAL RESILIENCE OF NPOS UNDER AUSTERITY PERIODS: THE CASE OF THE GREEK DEBT CRISIS

Dimitropoulos, Panagiotis[1]; Giannopoulos, Vasileios[2]

[1]Department of Accounting and Finance, University of the Peloponnese, Kalamata, Greece.

[2] Department of Accounting and Finance, University of the Peloponnese, Kalamata, Greece.

Keywords: Liquidity management, Financial vulnerability prediction, Financial resilience, Debt crisis, NPOs, Greece.

Introduction, Aim of Research

The goal of this study is to shed further light on the literature on NPOs resilience (probability of financial vulnerability) and liquidity management (LM) by considering the impact of a long-term recession caused by austerity measures during the Greek sovereign debt crisis. According to Jimeno Garcia et al. (2023), NPOs failure is not a sudden event but is a process that prolongs over time due to inadequacies to correct problematic situations. In other words, NPOs failure is a process of financial struggle which is not properly studied via static methodologies. Greece serves as a natural experiment for this research setting as it was the only EU country that implemented a sweeping economic adjustment program in early 2010, resulting in a reduction of GDP of up to 25%, an increase in unemployment to 25%, and a reduction of household disposable income and purchasing power (Kaplanoglou and Rapanos, 2016; Kyriopoulos et al., 2019). The Greek sovereign debt crisis offers a unique natural experiment for studying NPO financial resilience. The prolonged austerity (2009–2018) produced sustained revenue contractions, funding volatility, and liquidity shortages unparalleled in other EU economies. These conditions created a real-world stress test for liquidity management practices, allowing us to isolate how NPOs adapt under extreme and enduring fiscal constraints. Therefore, the findings extend beyond Greece, offering international insights for NPOs operating in environments of systemic economic shock, including Southern Europe and other regions experiencing protracted crises.

Research Design

The sample of this study includes private NPOs operating within the Greek territory from 2003-2018. These NPOs have the legal status of a charity (or foundation) or a non-profit enterprise that provides mainly health, cultural, and educational services to the public. The final sample included 31 private NPOs with complete financial data from 2003-2018, leading to a balanced sample of 496 observations. All financial data were hand-collected from NPOs' annual reports published on their websites. All sampled NPOs prepared their financial reports following the Greek Accounting Standards and have been audited by certified accountants, thus securing a uniform and valid estimation of accounts and financial figures. Following previous studies by Greenlee and Trussel (2000) and Trussel (2002), we estimated the probability of financial vulnerability for capturing the likelihood of NPOs' financial vulnerability. At first, a score is estimated based on the formula: Z = -3.061 + 0.1153*X1 + 1.2528*X2 – 2.2639*X3 – 3.4289*X4, where X1 is total equity/total revenues, X2 is the concentration of revenue income as Σ〖(〖Revenue sources〗_j/(Total revenues))〗^2, X3 is administrative expenses/total expenses, X4 is the margin estimated as (revenues – expenses)/revenues. Then, the probability of financial vulnerability (Prob FV) is estimated as 1⁄((1+ e^(-(-Z)))). A Prob (FV) above 0.10 provides a strong indication of financial vulnerability. At the same time, a value below 0.07 indicates that the NPO is deemed safe, so higher Prob (FV) values suggest a higher probability of vulnerability. In our setting, we estimated a dichotomous variable (DISTRESS) receiving unity (1) if an NPO has a Prob (FV) above 0.10 for any given year and zero (0) otherwise, and was the dependent variable on the following panel logit fixed-effect regression model estimated with robust standard errors:

$$DISTRESS_{it} = a_0 + a_1 WC_{it} + \beta_i CONTROLS_{it} + e_{it} \quad (1)$$

CONTROLS is a vector of control variables including SIZE which is the natural logarithm of total assets and captures the size of NPOs, SURPLUS which captures NPOs' profitability and is measured as the ratio of annual net income divided by total assets, and GROWTH measured as the annual revenue percentage change.

Results and Discussion

Empirical evidence documented that the larger the liquidity, the smaller the financial vulnerability probability of the NPOs. Also, NPOs with more cash, fewer receivable collection days, and more payable days (larger cash conversion cycles) are associated with a lower probability of

vulnerability. This impact is even more significant during the debt crisis than in the pre-crisis period, where efficient LM during austerity times boosts the NPO's financial resilience. The results present substantive implications for managers of NPOs. Firstly, NPO managers should promote the increase of current assets and further control and even reduce short-term liabilities to improve their probability of survivorship. Secondly, NPO managers should focus more on the specific traits of WC, namely accounts receivable, accounts payable, and cash reserves, as those have a differential impact on the probability of vulnerability. The sample of the study is relatively small due to insufficient financial data availability. Since we wanted to examine the impact of the austerity period on NPO financial vulnerability, we required NPOs to operate for an extended period. This could create some sample selection bias, which can be resolved by extending the sample by including other NPOs from countries with similar (though not so extensive) austerity periods, such as Greece (Spain, Italy, Portugal, etc.).

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ARTIFICIAL INTELLIGENCE IN HUMAN RESOURCE MANAGEMENT: ENHANCING TALENT ACQUISITION OR ERODING EMPLOYEE TRUST?

Sposato, Martin[1]; Vouzas, Fotis[2]; Nizamidou, Christina[3]; Stamatiadou, Kyriaki[4]

[1]College of Business, Zayed University, Dubai, UAE

[2]Department of Business Administration, University of Macedonia, Thessaloniki, Greece

[3]EuroMed Academy, Nicosia, Cyprus

[4]Department of Business Administration, University of Macedonia, Thessaloniki, Greece

Keywords: Human Resources, Artificial Intelligence, Talent Acquisition, Employee Relations, Trust, Recruitment Technology, HR Analytics, Workforce Management.

Artificial intelligence technologies have become increasingly prevalent in human resource management, fundamentally altering how organizations attract, evaluate, and retain talent. Contemporary HR departments deploy AI-powered systems for resume screening, performance evaluation, and employee engagement monitoring (Budhwar et al., 2022), promising enhanced efficiency, reduced bias, and improved decision-making. However, their implementation raises concerns about preserving human judgment in personnel decisions and maintaining employee-organization trust. Employee responses differ across AI applications, with AI-supported recruitment tools often seen as more objective and efficient, whereas AI-driven performance evaluations or promotion systems may raise fairness and transparency concerns.

This research examines how AI implementation in HR processes affects employee perceptions of organizational fairness and trustworthiness. We investigate whether algorithmic decision-making in recruitment, performance evaluation, and promotion strengthens or undermines the employee-employer psychological contract. Our objective is to assess the tension between HR analytics' promised efficiency gains and the potential deterioration of interpersonal trust. We additionally explore whether algorithmic transparency moderates employee acceptance of AI-mediated HR decisions.

AI integration into HR practices builds on long-standing research in personnel psychology and organizational behavior. Traditional talent management approaches emphasize interpersonal

interaction, subjective judgment, and contextual understanding. Conversely, AI systems rely on pattern recognition, statistical correlation, and standardized criteria (Sposato et al., 2025). This creates theoretical tension between computational efficiency and relational authenticity (Raisch & Krakowski, 2021). Organizational justice theory suggests that procedural fairness significantly influences employee attitudes (Colquitt, 2001), as commitment may diminish when HR processes appear impersonal, regardless of outcomes. Trust theory indicates that transparent, accountable decision-making strengthens employer-employee relationships (Glikson & Woolley, 2020).

We employ a mixed-methods approach combining quantitative surveys and qualitative interviews across three financial services and retail organizations that recently implemented AI-driven HR systems with varied cultures and digital maturity. Our quantitative phase utilizes validated scales measuring organizational trust, perceived fairness, and psychological contract fulfilment, administered to 230 employees before and after AI implementation. Statistical analysis examines correlations between AI exposure and trust indicators while controlling demographic variables. Our qualitative phase conducts semi-structured interviews with 45 employees and 15 HR professionals to capture nuanced perspectives on how algorithmic decision-making influences workplace relationships.

Preliminary analysis reveals employee trust in HR systems decreases when algorithmic processes lack transparency regarding decision criteria. Employees express concern about automated performance evaluations that overlook contextual factors, whereas organizations maintaining human oversight experience minimal trust erosion. Younger employees demonstrate greater acceptance of AI-mediated HR decisions than older colleagues, suggesting generational differences. Findings indicate that HR-AI's impact on employee trust depends critically on the implementation approach rather than technology adoption itself.

This research contributes to emerging literature on algorithmic management by focusing on HR functions where interpersonal trust is essential (Kellogg et al., 2020). While previous studies examined efficiency gains from HR analytics, fewer investigated potential relational costs. Our work advances understanding of how organizations can leverage AI capabilities without sacrificing human elements that sustain employee commitment. Findings indicate that long-term dependence on AI-driven HR systems can shift organizational culture and fairness perceptions, affecting employee well-being. These insights offer practical guidance for HR professionals navigating technological advancement and relationship preservation.

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EFFECTIVE LEADERSHIP FOR INNOVATION: THE ROLE OF ATTACHMENT ORIENTATIONS AND ETHICAL CLIMATE

Salton Meyer, Efrat[1]

[1]Baruch Ivcher School of Psychology, Reichman University (RU) Herzliya, Israel

Keywords: Innovation leadership, Creativity, Attachment orientations, Ethical climate, Leader-follower relationships, Burnout, Wellbeing.

Achieving high-quality innovation requires high levels of creativity, technical expertise as well as resilience, effective teamwork, collaboration, and trust in challenging conditions. These can be achieved when people are at their best, enabling that is leader's role including by managing workplace psychological dynamics. This work focuses on two central yet under-integrated factors in leading innovation: attachment orientations of leaders and subordinates (for a recent review see Mayseless and Popper, 2019), and organizational ethical climates in contemporary organizations characterized by rapid technological change, uncertainty, and increasing demands for innovation.

The purpose of this work is to examine how attachment orientations of leaders and subordinates and organizational ethical climates are linked to outcomes that can impact innovation. An existing gap in research on that necessitates new conceptual and empirical paths. The current presentation proposes a multi-level model linking individual, interpersonal, and organizational factors to consequences related to innovation.

Individual differences in attachment orientations include secure attachment comprising positive mental representations of self and others, insecure attachment incorporates anxious (hyper activating) and avoidant (deactivating) strategies (Mikulincer and shaver, 2007;2016). Attachment security is central in skill acquisition, growth, self-actualization (Mikulincer and shaver, 2007) that are important for innovation. Research has revealed that attachment orientations are significant in explaining leader follower interpersonal dynamics; secure leaders were perceived more effective and their subordinates' satisfaction and wellbeing were higher (De Sanctis and Karantzas, 2008), in challenging times leaders' attachment security was found especially significant for subordinates (Mayseless and Popper, 2019). Subordinates of insecure leaders reported higher burnout and lower job satisfaction (Ronen and Mikulincer, 2012). Subordinates'

insecure attachment was related to distress, burnout, and negative perceptions of leaders (Salton Meyer et al., 2016; Salton Meyer and Ein-Dor, 2021), and was negatively linked to employee creativity through the mediating role of leader-member exchange [LMX] and team-member exchange [TMX]) (Kirrane et al., 2019).

Caring ethical climates comprise concern for the well-being of others, they were preferred by workers and were linked to subordinates' wellbeing, satisfaction, and lower burnout (Salton Meyer et al., 2016). Negative outcomes such as burnout were related to reduced creativity which is needed for innovation (Bunjak, et al., 2021). Ethical climates can function as activating contextual cues for subordinates' attachment orientations (Salton Meyer et al., 2018). The role of ethical climate in innovative behaviors in nursing has been investigated (Akkoç, et al, 2022), however, the role of both attachment orientation of leaders and followers and ethical climates in innovation leadership have not been explored.

This work adopts a conceptual integrative insight approach grounded in prior empirical research on attachment orientations, leadership, ethical climate and creativity in organizations and synthesizes a framework focused on innovation leadership.

The meaningful contributions of this conceptual work include the significance of the link between leaders' secure attachment and subordinates' positive workplace consequences and positive views of leaders that can contribute to workers' learning and development, that are central for creativity in innovation. Also, insecure attachment orientations of leaders and subordinates related to negative workplace consequences that may hinder innovation processes. Finally, caring ethical climates are associated with more positive feelings and attitudes that may be related to ingenuity and invention. The integration of these in a framework portrays how attachment orientations and ethical organizational climates can be central for innovation in organizations.

This conceptual work builds on prior empirical findings and offers a novel integrative construct that connects innovation leadership in contemporary workplaces to attachment orientations and organizational ethical climates. The original contribution of the current presentation is in its suggestion that innovation leadership in organizations is connected to both attachment orientations and to ethical organizational climates.

However this conceptual presentation is based on empirical work in few organizational contexts, which may limit generalizability. Further empirical research across diverse organizational settings is suggested.

This work highlights the importance of integrating central psychological and organizational perspectives in innovation leadership research. It suggests that organizations may enhance innovation by developing leaders' "people skills" and fostering caring ethical climates. Practical implications include highlighting important aspects of managers' training and mentoring as well as the importance of fostering caring ethical climates in organizations that strive for innovation.

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EMOTIONAL SALARY, INNOVATION, AND JOB ATTRIBUTES: AN ANALYSIS OF PERCEPTIONS OF JOB SATISFACTION, COMMITMENT, AND TENURE AMONG MILLENNIALS AND GENERATION Z IN LATIN AMERICA

Ramírez-Lozano, Julianna Paola[1]

[1] Pontificia Universidad Católica del Peru, Lima, Perú.

CENTRUM Católica Graduate Business School, Lima, Perú.

Keywords: Millennials, Generation Z, job satisfaction, job commitment, job tenure

Abstract

Purpose

The study analyses the perceptions of Millennial and Generation Z employees regarding key factors such as salary, innovation, and job attributes, and their relationship with job satisfaction, commitment, and tenure in Peru, a Latin American context. It also provides empirical evidence on the new labour dynamics of these generations.

Design/methodology/approach

Mixed-methods study with 271 questionnaires of Millennial and Generation Z employees in Peru, complemented by 4 focus groups (2 per generation, one for women and one for men).

Findings

The study reveals that emotional salary (M=4.59), career path opportunities (M=4.58), and competitive economic compensation (M=4.52) are the main determining factors. The cross-generational importance of emotional salary is confirmed, while the possibility of innovating emerges as a progressive factor from job satisfaction to organisational commitment. Millennials show greater appreciation of intrinsic attributes compared to Generation Z, while both generations converge in the appreciation of extrinsic attributes.

Originality/value

It provides Latin America–specific empirical evidence on new generations' job expectations, developing a conceptual framework with three variables that explain generational job decisions and validating culturally adapted measurement instruments.

Practical implications

It provides insight into the current context in which Millennials and Generation Z operate, offering recommendations for companies to improve recruitment processes and implement policies that promote job tenure.

Introduction

The contemporary labour landscape is undergoing an unprecedented transformation with the massive incorporation of Millennials (born 1981–1995) and Generation Z (born 1996–2010) into the workforce (Mendoza et al., 2021). Millennials and Generation Z are increasingly demanding regarding social responsibility policies that lead to job satisfaction, such as environmental care and the company's relationship with its employees (Ramirez Lozano et al., 2024).

Previous studies recognise the demands of the new generations, highlighting flexible schedules, freedom to innovate, career development, recognition, emotional salary, and other aspects such as the company's concern for environmental care and social responsibility towards its stakeholders.

When they see that their company is not offering them opportunities for growth, they look elsewhere (Golik, 2013). However, most studies have been conducted in developed countries, with limited empirical evidence in Latin American emerging economies where socioeconomic dynamics may shape these preferences.

Labour turnover indicators in the region show that 67% of employees under 35 consider changing jobs within the next two years (Deloitte, 2021), revealing a misalignment between generational expectations and current organisational value propositions. In Peru, according to the National Institute of Statistics and Information (INEI, 2025), the Economically Active Population (EAP) reached approximately 18,377,200 people in the first quarter of 2025.

The present study addresses this issue through three fundamental research questions: (1) What aspects are relevant for employees to feel job satisfaction with the company where they work? The research contributes to knowledge by extending social exchange theory and work motivation models to the Latin American context, proposing an integrated three-level hierarchical framework to understand generational job decisions.

Literature Review

Millennial and Generation Z population

Millennials, born between 1981 and 1995, entered the workforce during a period of economic uncertainty after being raised during economic prosperity and expansion (Aydogmus, 2019). Generation Z, born between 1996 and 2010, integrates technology into personal and professional life, enhancing job performance (Naim and Lenka, 2018).

Emotional salary and cross-generational job expectations

Millennials are fast learners, question rules, show little interest in corporate hierarchy, and seek meaningful work with constant recognition. Generation Z feels confident using technological tools to perform their jobs and is considered to possess strong technical skills (Bermúdez-González et al., 2023). Expectations regarding emotional salary show convergence between both generations, leading to the following hypothesis:

H1: In terms of the decision of job tenure within an organisation, emotional salary is considered an important variable by both Millennial and Generation Z employees.

Innovation and progression in organisational commitment

Companies recognise innovation as essential to remain competitive in a constantly evolving market. The incorporation of young talent not only refreshes and diversifies the workforce but also brings a modern vision suited to the current context (Battista et al., 2014). A culture that fosters business innovation is one of the most significant attractions for Generation Z and Millennial employees, being essential for achieving higher levels of job satisfaction and for developing stronger organisational commitment (Hill et al., 2024).

H2: The possibility of innovating within the company is considered a more important attribute for achieving job commitment than for achieving job satisfaction.

Generational differences in the valuation of intrinsic attributes

Responsibility for oneself, making independent decisions, and achieving financial independence are fundamental criteria for them (Broadbridge et al., 2007). For these generations, authority is built through example rather than power (Caldumbide, 2012). Generation Z shows characteristics in its approach to work. Differences in how relational and recognition aspects are valued across generations lead to the following hypothesis:

H3: For achieving job satisfaction, Millennials place greater importance on intrinsic attributes such as the work climate compared to Generation Z professionals.

Convergence in the valuation of extrinsic attributes

Millennials and Generation Z show an inclination towards jobs that offer high salaries, opportunities for career advancement, teamwork, and the performance of meaningful tasks (Ali et al., 2024). Generation Z and Millennial employees place significant value on organisational pay practices due to the uncertain business environment and economic recession (Bermúdez-González et al., 2023).

While salary remains a relevant factor, these young employees also value non-monetary benefits such as health insurance, paid time off, and company-funded professional development opportunities (Aydogmus, 2019). Convergence in economic aspects and organisational prestige across both generations leads to the following hypothesis:

H4: For achieving job satisfaction, both Millennial and Generation Z professionals equally value extrinsic attributes such as economic salary, company prestige, or organisational recognition.

Corporate culture and talent retention policies

Research in human resource management emphasises the need to integrate employee retention strategies as essential principles in organisational policies to achieve job tenure. These young professionals value a friendly work environment, opportunities for continuous learning, the use of innovative technologies, and programmes that promote corporate social responsibility.

Employee tenure is influenced by a range of factors, including job satisfaction, organisational trust, organisational culture, effective leadership, and job commitment. One of the factors that most strongly and quickly contributes to employee tenure is offering attractive salaries and economic and social benefits that help increase employee motivation (Septiem & Martin-Rios, 2017).

Determinants of job satisfaction and job commitment

Job satisfaction and job commitment are fundamental aspects for the success and stability of any organisation (Stynen et al., 2014). Work–life balance and job flexibility positively impact the job satisfaction and performance of Millennials and Generation Z, which in turn influences their level of job commitment and tenure within the company (Waworuntu et al., 2022; Jung and Yoon, 2021).

Currently, companies are adapting to integrate the new generation of employees, requiring them to adopt new strategies in their culture and employment offerings (Garavito Quiroga et al., 2022). It is an essential part of employee commitment and can have a significant impact on

an organisation's sustainability (Vergara, 2019). Unlike previous generations, these groups value job flexibility (Lee et al., 2023). Another important determinant of job satisfaction and job commitment for Millennials and Generation Z is professional development and growth opportunities (Pant and Venkateswaran, 2019).

Methodology

Research design

The specific objectives of the study were to identify the main factors influencing job tenure for Millennials and Generation Z; to examine expectations regarding work–life balance and their impact on job satisfaction; to characterise the elements that generate organisational commitment among Millennials and Generation Z; and, finally, to determine the professional aspirations and medium- and long-term career projections of the employees studied.

The research adopted a sequential explanatory mixed-methods approach. It includes a survey of Millennial and Generation Z individuals. The study was complemented by qualitative research through focus groups, also conducted with individuals from these generations, including both men and women participants.

Quantitative research

A total of 157 questionnaires (57.9%) were completed by Generation Z participants, while 114 (42.1%) were completed by Millennials.

Instrument and measurements

The structured and standardised questionnaire includes relevant categories such as (i) job satisfaction, (ii) job commitment, (iii) job tenure, and (iv) additional information such as gender, age, educational level, district of residence, studies, occupation, marital status, among others.

Data analysis

The same software was also used to perform inferential tests, such as the t-test, to examine mean differences between groups based on gender, education (undergraduate and postgraduate), and age (20–29 years and 30–39 years).

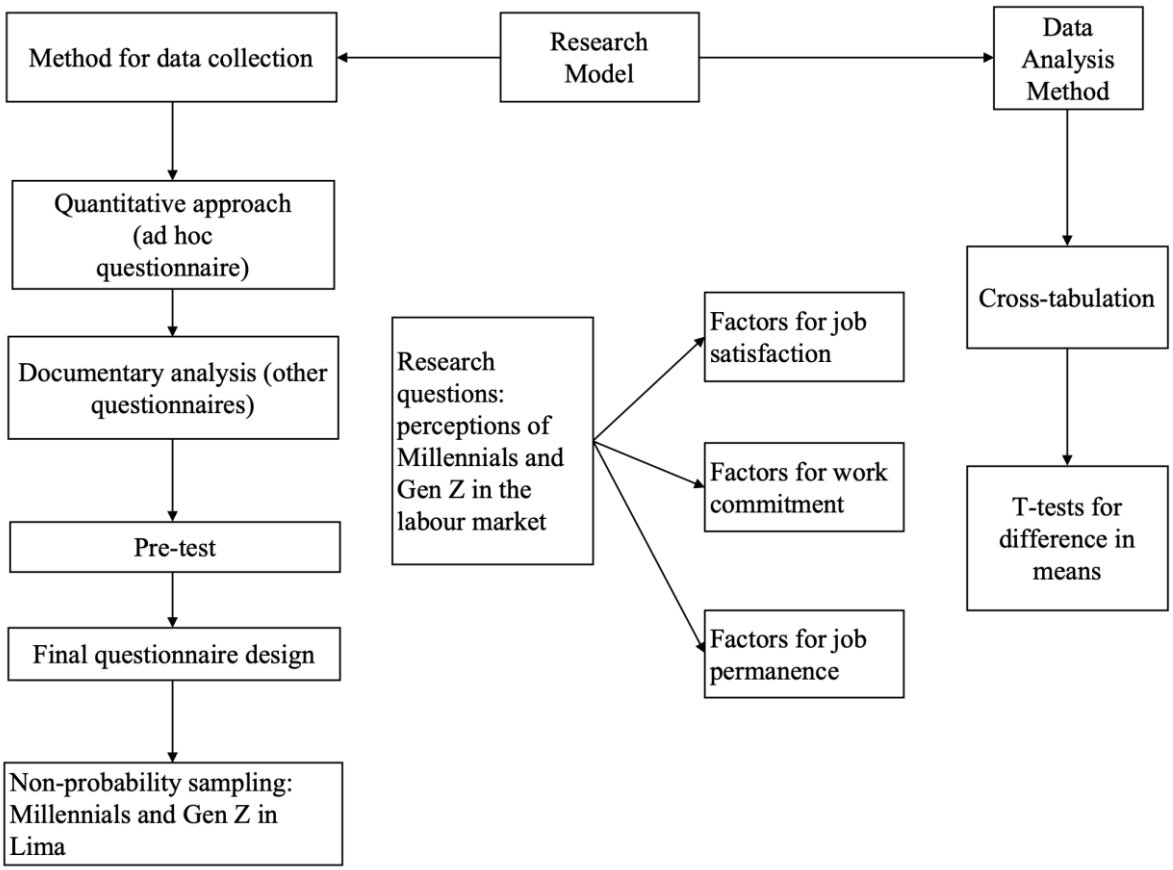


Figure 1: Research model of the study
Source: Author's own creation

Qualitative research

At the qualitative level, four focus groups were conducted with young employees from the Millennial and Generation Z generations to understand their perceptions, attitudes, and behaviours regarding job satisfaction, job commitment, and job tenure. Some employees were in their first or second job, while others were in their sixth or seventh job, with work experience ranging from 3 to 15 years. The analysis was conducted using the Thematic Analysis methodology in Psychology for qualitative content (Braun and Clarke, 2006), based on the transcriptions of the four focus groups.

Results

Quantitative study analysis

The data obtained through the questionnaire in the quantitative study allow for the evaluation of the relevance of attributes, both for the total sample and across different segments, using a traditional Likert scale from 1 (not important) to 5 (very important).

Job satisfaction

When evaluating the first aspect of the employee–organisation relationship, job satisfaction, a group of the most relevant attributes emerges. The opportunity to follow a career path (mean score 4.55), perceived emotional salary (4.52), a positive work climate and concern for organisational culture (4.52), as well as receiving a market-competitive salary (4.50), are rated as the most important attributes by the participants.

Following this group, at a slightly lower level, is the evaluation of the supervisor and other higher-level managers (4.40), with the remaining aspects forming a third group of attributes with similar mean scores ranging from 4.16 to 4.26.

When analysing differences in perceptions between the two generations studied, it is observed that, regarding job satisfaction, the perception of offering quality products or services is more relevant for Millennials (mean 4.44 versus 4.18 for Generation Z, with a p-value of 0.07, confirming the statistical significance of this difference).

Analysing the results by gender, men value the opportunity to innovate within the organisation the most (4.34 versus 4.18 for women, with a p-value of 0.12), while women place higher importance on corporate social responsibility (CSR), also giving greater importance to an attribute such as care for the environment (4.26 compared to 4.07 for male participants, with a p-value of 0.11).

On the other hand, participants with graduate education perceive greater importance in monetary salary (4.62 versus 4.45 for participants with university education, with a p-value of 0.09) and in the company offering products and services suited to society (4.35 versus 4.20 in the other segment, with a p-value of 0.2 confirming the significance of this difference in means). Meanwhile, those with only university education value working strictly within working hours more (4.24 versus the average of 3.99 for graduate individuals, with a p-value of 0.06).

Job commitment

The second aspect evaluated in this study was employees' commitment to the company, identifying five attributes as most relevant from the respondents' perspective: (1) work environment and focus on organisational culture (mean of 4.52), (2) emotional salary (4.49), (3) career path within the organisation (4.44), (4) monetary compensation in line with or above the market (4.43), and (5) good relationship with managers and superiors (4.42).

In the main group of attributes, it is notable that Millennials place the highest value on relationships with managers (mean of 4.54 versus 4.34 for Generation Z, with a p-value of 0.05), a pattern not observed for job satisfaction.

Regarding gender differences among participants, two findings stand out in men's evaluation of attributes related to job commitment. Men place higher value on both respect for working hours (mean of 4.26 versus 4.10 for women, with a p-value of 0.17 confirming this difference in means) and the opportunity to innovate within the company (4.37 compared to 4.16 for women, with a p-value of 0.07).

Meanwhile, participants with graduate education place greater value on the opportunity to pursue a career within the organisation (4.56 versus 4.40 for those with only university education, with a p-value of 0.1), the opportunity to innovate (4.37 versus 4.21, with a p-value of 0.18), and the recognition of leaders' ethical and responsible behaviour (4.28 versus 4.12 for those with university education, with a p-value of 0.19).

Desire for job tenure

Regarding the last element evaluated in the employee–company relationship, two clear attributes stand out as part of the main group, both exceeding an average rating of 4.5: receiving monetary compensation in line with or above the market (mean of 4.59) and the emotional salary or non-monetary benefits provided by the organisation (4.54).

A second group of attributes, with similar averages, also appeared: the opportunity to pursue a career path within the organisation (4.47) and a good work environment with focus on developing organisational culture (4.44).

Regarding the main group of attributes, it should be noted that the attribute "receiving monetary compensation in line with or above the market" is more valued by Millennials (mean of 4.8 versus 4.49 for the following generation, with a p-value of 0.94 confirming the statistical significance of this difference)

Men consider attributes such as the opportunity to innovate within the company more important (mean of 4.37 versus 4.16 for women, with a p-value of 0.07 confirming the difference between these means) and respect for working hours (4.26 versus 4.10 for female respondents, with a p-value of 0.17).

Qualitative study analysis

The analysis of qualitative results is presented based on the factors identified as determinants of job satisfaction, commitment, and tenure among Millennial and Generation Z professionals.

Evaluation of traditional attributes

Traditional attributes such as monetary salary and basic working conditions remain important for participants. However, these factors appear as necessary but not sufficient conditions to generate long-term job satisfaction and job commitment.

> "I take with me the experiences of knowledge, and if there have been friendships I was able to make, I take those friendships wherever I go." (focus group 3 participant)

This statement reflects how, for young professionals, the value of work goes beyond the merely economic.

Emergence of intangible factors

Participants strongly emphasised the importance of intangible factors in their decision regarding job tenure:

- **Work schedule flexibility and work–life balance**: Desire for continuous progress and career growth
- Professional recognition: "The economic aspect and the professional aspect[...]" noted one participant, highlighting the importance of both for job satisfaction
- Organisational culture and work environment: Provides an inclusive workplace, professional development opportunities, flexible benefits, and a collaborative atmosphere

Importance of professional development and growth

The analysis reveals that opportunities for professional development are one of the main motivators for job tenure within an organisation.

> "In fact, this company has a clear career path. You start as a junior, then become an assistant analyst, then a senior analyst, and finally receive company benefits." (focus group 2 participant)

Expectations about the employer-employee relationship

Participants expressed a clear expectation of transparency and trust in their work relationships.

> "I was told 'I would love for you to be a manager, but you know what? You're thirty years old, and my managers in this company are over forty.' This illustrates how a lack of transparency regarding promotion criteria can negatively affect young employees' perception." (focus group 1 participant)

Young employees especially value consistency between the values companies declare and their daily practices.

> "What I value most is the way employees are treated, whether you've been there eight years or two months or a month, everyone treats you as an equal," highlighting the importance this generation places on fairness in treatment and organisational culture.

Work-life balance

The analysis reveals widespread concern about balancing personal and professional life. Young participants perceive that current job demands often intrude on personal time, creating tensions and potentially affecting well-being.

They expressed a strong preference for work environments that provide flexibility and autonomy in time management. Remote work and hybrid models emerged as highly valued modalities among younger participants.

> "I think what I value most about my current company are the business trips, particularly not having to accompany the manager. They give me a lot of freedom regarding my schedule and decision-making." (focus group 3 participant)

Drivers of organisational commitment

The analysis reveals an interesting dynamic between the value placed on emotional and economic salary. Although the economic factor remains relevant, a clear appreciation of intangible aspects of work emerges.

> "Yes, I prioritise emotional factors over economic ones because, ultimately, your performance depends on your motivation. Without motivation, you won't achieve anything." (focus group 1 participant)

Leadership style emerges as a determining factor in organisational commitment. Testimonies show that leaders who recognise work, provide constructive feedback, and show genuine interest in the development of their teams foster higher levels of commitment.

Discussion

H1: Cross-cutting importance of emotional salary

Emotional salary showed similar importance for both generations, with no significant differences between Millennials and Generation Z ($p > 0.05$), validating its cross-cutting relevance. This aligns with Tarigan et al. (2022) on Generation Z's valuation of non-monetary factors, including a positive work environment and continuous professional development, and

suggests that emotional salary represents a lasting evolution in job expectations across generations.

H2: Progressive importance of innovation

Qualitative data show a clear progression in the value placed on opportunities to innovate from job satisfaction to organisational commitment, consistent with evidence that an innovation culture attracts Millennial and Generation Z employees and supports both outcomes (Hill et al., 2024).

H3: Millennials prioritise intrinsic attributes

Specifically, they value leaders' ethics and responsibility more (4.28 vs.
This finding aligns with research indicating that Millennials expect to find fulfilment in their work, value meaningful work, and consider consistency between declared values and organisational practices essential (Pant and Venkateswaran, 2019).

H4: Similar valuation of extrinsic attributes

Both generations value monetary salary and corporate prestige similarly, with no significant differences, confirming economic pragmatism and the role of competitive compensation as a foundation for other career aspirations.

The predominance of emotional salary suggests a more holistic psychological employment contract. The hierarchy (emotional salary > career path > monetary salary) indicates that Herzberg's (1959) hygiene factors remain preconditions while motivational factors extend to self-actualisation, innovation, social impact, and work–life balance, consistent with Jung and Yoon (2021).

Findings reveal more convergence than divergence between Millennials and Generation Z, contrary to media stereotypes; nevertheless, Millennials place greater value on interpersonal relationships and business ethics, while Generation Z shows greater pragmatism and autonomy. In Peru, global generational job expectations are shaped by regional socioeconomic realities; theories therefore require adaptation to emerging economies, where basic economic stability shapes but does not eliminate broader aspirations for professional fulfilment.

Conclusions

This study provides significant empirical evidence on the job perceptions of Millennials and Generation Z in a Latin American context, challenging generational stereotypes while confirming contemporary work trends. These changes transcend generational divides and

reflect a holistic conception of employment that combines economic aspirations, personal development, and social impact.

The three determining factors in job commitment are emotional salary (M = 4.59), career path opportunities (M = 4.58), and competitive monetary compensation (M = 4.52), indicating that intangible aspects may outweigh purely economic considerations in initial employment decisions. Work environment and organisational culture are cross-cutting factors in job satisfaction (M = 4.52), job commitment (M = 4.52), and job tenure (M = 4.44), supporting investment in culture to attract and retain young talent.

Theoretical and practical contributions

The integrated four-level model extends Herzberg's (1959) work motivation theory to Latin America and, through identity-based exchanges, personal development, and social purpose, extends Blau's (1964) social exchange theory to the contemporary psychological employment contract. The Peruvian evidence also shows that global expectations adapt to regional socioeconomic realities. Practically, the findings support redesigning talent management, retention policies, and employee value propositions in Latin American organisations. More humanised and meaningful work is a cross-cultural phenomenon with local manifestations, and organisations can respond through effective, culturally sensitive policies without sacrificing operational efficiency or economic competitiveness.

The results validate the four proposed hypotheses, providing robust empirical support for specific but limited differences between generations: emotional salary is cross-cutting with no significant differences; innovation progresses from job satisfaction to organisational commitment; Millennials place greater value on work environment and recognition; and both generations converge in valuing monetary salary and corporate prestige.

Practical recommendations

- Comprehensive salary policies: Develop compensation systems that combine economic and emotional elements, including flexible schedules, recognition, and development opportunities.
- Structured career paths: Implement mentorship and professional development programmes with clear growth trajectories.
- Positive organisational culture: Invest in work environment, effective communication, and consistency between declared values and actual practices.
- Work flexibility: Adopt hybrid and remote modalities that enable work–life balance.

- Spaces for innovation: Create progressive opportunities for creative contribution and development of new ideas.

Limitations and future research directions

These limitations should be considered when interpreting the results. Future research should address them through:

- Longitudinal studies: To examine the evolution of job attitudes over time
- International comparative analysis: Incorporating different Latin American cultural contexts
- Intra-generational differences: Exploring variations within each generation
- Organisational strategies: Evaluating the effectiveness of different business responses
- Impact of emerging trends: Analysing how technological and social factors shape job expectations

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IS HUMBLE LEADERSHIP AN IMPLICIT OXYMORON? EXAMINING INTERPERSONAL DYNAMICS AND JOB SATISFACTION

Travlou, Anastasia[1]; Ntalianis, Filotheos[2]; Ntaliani, Maria[3]

[1] ICON plc (ISS Division), Athens, Greece

[2] Department of Business Administration, University of Piraeus, Piraeus, Greece

[3] Department of Agricultural Economics and Rural Development, Agricultural University of Athens, Athens, Greece

Keywords: Humble Leadership, Psychological Contracts, Job Satisfaction, Motivation, Greece.

Introduction

Is humble leadership an implicit oxymoron? Building on seminal research (Owens and Hekman, 2012), the current study calls into question the popular perception of humility as a trait not typically associated with successful leadership. Recent studies highlight how humble leadership serves as a critical resource in addressing contemporary employee disengagement problems (Rego et al., 2019). Despite these advances, research remains fragmented, limiting our understanding of how humble leadership simultaneously operates at the interpersonal level through different psychological mechanisms (i.e., psychological contract and internal motivation) to influence job satisfaction, particularly in underexplored Mediterranean contexts such as Greece (Rockstuhl et al., 2012). Thus, the primary goal of this research is to provide greater insight into how humble leadership fosters employee job satisfaction by shaping the interpersonal and motivational dynamics between leaders and their subordinates within the Greek context.

Purpose, Aim and Objectives

The research aims to investigate the relational mechanisms linking leader humility to employee outcomes—specifically, how humble leader behavior influences internal motivation and perceptions of psychological contract breach (Rousseau, 1989) in Greece. It further explores whether humble leadership mitigates a) the negative effects of perceived contract breaches on job satisfaction and b) enhances the positive effects of internal motivation on job satisfaction by serving as a relational signal of support and equity.

Methodology and Methods

Data were collected through an online questionnaire, designed in accordance with institutional ethical guidelines ensuring voluntary participation, anonymity, and confidentiality. The final sample consisted of 230 employees (mean age = 36.49 years; range 23–65 years), predominantly women, from diverse sectors including hospitality, healthcare, finance, and sales in Athens, Greece. The survey utilized well-validated measures to assess employees' perceptions of their leader's humility (Owens et al., 2013), internal motivation (Battistelli et al., 2017; Gagné et al., 2015), psychological contract breach (Robinson and Morrison, 2000), and job satisfaction (Brayfield and Rothe, 1951). Analysis was conducted using regression analysis as well as the PROCESS macro (Hayes, 2014) to test the proposed interpersonal pathways.

Main/Expected Findings and Contribution

Findings reveal that humble leadership enhances job satisfaction primarily through indirect interpersonal pathways. Specifically, humility in leaders reduces employees' perceptions of psychological contract breach, which directly translates to higher job satisfaction. Additionally, humble leaders foster internal motivation, which independently contributes to satisfaction. These results align with recent evidence suggesting that humble leaders create a safe environment for interpersonal risk-taking and engagement (Jiang et al., 2021; Ervianto et al., 2025). Interestingly, higher internal motivation slightly diminished the marginal impact of humility, indicating that its interpersonal benefits are most significant for less intrinsically motivated employees.

Theoretical and Practical Applications/Implications

These results highlight the central role of interpersonal relationships in mediating leadership effectiveness in the Mediterranean context. Greek employees experience greater job satisfaction when leaders demonstrate humility by upholding relational obligations and fulfilling the psychological contract. Practically, organizations should promote humility in leadership as a core competency. Human resource strategies should leverage training and experiential workshops to cultivate these interactions, as humble leadership serves as a vital job resource for navigating complex organizational landscapes and meeting modern workforce needs (Wang et al., 2023). Notwithstanding these contributions, future research should seek to address limitations associated with common source bias and restricted generalizability by employing methodological triangulation and utilizing larger, more diverse samples.

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MAPPING THE UNCHARTED TERRITORY OF AGILE TEAMWORK: IDENTIFYING KNOWLEDGE GAPS AND SETTING A RESEARCH AGENDA – A SYSTEMATIC LITERATURE REVIEW

Tirrel, Henning[1]

[1]Faculty of Business, Ostfalia University of Applied Sciences, Wolfsburg, Germany

Keywords: Agile Teamwork, Systematic Literature Review, SLR, Research Agenda, Gap, Agile Transformation, COVID-19, Agility

Abstract

Agile teamwork has been introduced in several companies. However, the empirical foundation remains limited and relevant information on the agile transformation process is lacking. Thus, this study aims to summarize open knowledge gaps and provide an agenda for further research on agile teamwork. A systematic literature review was conducted by using EBSCOhost and Emerald Insight databases, which identified 17 relevant peer-reviewed journal articles on agile teamwork. Findings highlight that there are still several knowledge gaps on agile teamwork. These have been categorized into four domains: Definitions, composition of the team, virtuality/technology and methodology. This is the first study which presents future potential for agile teamwork research based on a systematic literature review. Thus, this sets the starting point for researchers in this field for generating more empirical findings.

Introduction

Companies are increasingly introducing and adopting agile work practices due to their beneficial effects on team efficacy and creativity (Junker *et al.*, 2022; Singh *et al.*, 2023; Uraon, Chauhan, *et al.*, 2024). The agile transformation process enables teams to work independently instead of adhering to strict hierarchical orders (Tripp *et al.*, 2016). Thus, employees work future-oriented and proactively by adopting agile work practices (Grass *et al.*, 2020; Parker *et al.*, 2019), being the aim of the agile transformation process (Rigby *et al.*, 2020). Furthermore, agile work practices are no longer confined to software development and are now implemented in various companies and departments (Cappelli and Tavis, 2018). As

such, agile work is employed in several teams without following strict rules of agile methods like Scrum (Junker *et al.*, 2022; Schwaber and Sutherland, 2017).

Although several companies are undergoing the agile transformation process, literature on how agile work affects work teams is lacking (Junker *et al.*, 2022; Mathieu *et al.*, 2019). In addition, the COVID-19 pandemic might also have influenced the transformational route due to more inclusion of flexible work practices and technology usage (Kamp *et al.*, 2024; Tirrel, 2023). Thus, the research question raised is: What are current knowledge gaps in agile teamwork? In line with the research question, the aim is to develop and present avenues for further research on agile teamwork to set an empirical foundation.

Therefore, this paper contributes to knowledge by, firstly, systematically analyzing the existing literature on agile teamwork. Secondly, potential knowledge gaps are derived and structured, derived from existing literature and presenting the route for further research on agile teamwork in various companies and various departments. The findings have implications for theory but also for organizations which are currently or in the future undergoing the agile transformation process.

Research methodology: systematic literature review

A systematic literature review (SLR) is applied in this study for identifying, selecting, analyzing and synthesizing relevant information (Brereton *et al.*, 2007). The usage of a review protocol is of paramount importance as it makes studies replicable, transparent as well as rigorous due to the careful evaluation of literature, leading to reliable findings (Atewologun *et al.*, 2017; Brereton *et al.*, 2007; Christofi *et al.*, 2017; Denyer and Tranfield, 2009; Inkinen, 2015; Kitchenham, n.d.; Tranfield *et al.*, 2003; Webster and Watson, 2002). A quality assessment is also implied which relies on the implicit quality of peer-reviewed papers and ranked journals (Tranfield *et al.*, 2003). Therefore, the SLR is "a specific methodology to locate research, to select and evaluate the contributions made by each study and analyze and synthesize the data" (Lozano-Reina and Sánchez-Marín, 2020, p. 2). In the following sections, the review protocol with its in- and exclusion criteria as well as the search strategy and selection of relevant papers will be described.

Inclusion criteria

The researcher has to define which studies are included in the SLR, based on three criteria: Search boundaries, search terms and strings as well as the timeframe (Dada, 2018; Wang and

Chugh, 2014). This study focuses on electronic databases only, which are subject specific, i.e., focusing on business management. The EBSCOhost and Emerald Insight databases have been analyzed. Keywords were developed for this research in order to cover a broad area and obtain many potentially relevant articles (Kauppi *et al.*, 2018; Müller-Seitz, 2012; Tirrel and Winnen, 2018). This minimized the risk of missing articles in literature. For this study, the timeframe was determined between 2016 and 2026. Thus, the last decade of research on agile teamwork has been included. This makes it possible to derive a modern research agenda, as the papers included are not too old and identified research gaps have not already been closed. In addition, times before and after the COVID-19 pandemic are included, which may have affected agile teamwork.

Exclusion criteria

Papers which have not undergone a peer-review were eliminated in order to achieve results of high quality, i.e. implicit quality of papers is the foundation of this analysis (Tranfield *et al.*, 2003; Vrontis and Christofi, 2021). Furthermore, the papers were evaluated according to their ranking in the Association of Business School Academic Journal Quality Guide as well as the Scopus indices (Matturro *et al.*, 2022; Tirrel, 2023). Book chapters, conference proceedings and other papers have thus been excluded from this study. Furthermore, only papers published in English, the standard for knowledge-based scientific papers (Kauppi *et al.*, 2018), and German (mother tongue of the researcher) were included in order to outperform the language bias (Bettany-Saltikov and McSherry, 2016). Moreover, papers were controlled for duplicates, which were eliminated.

Search strategy and selection of relevant papers

The search string, i.e., combination of keywords, has been entered into the databases. The following search string has been used “agile teamwork” OR “agile team work”. This includes the modern and the older spelling, so as not to exclude any articles based on the spelling. Moreover, both spellings were combined by the Boolean operator OR. The search string is very narrowed, in order to answer the research question (Tandon *et al.*, 2024). This led to 172 articles in the database.

Following the steps from Tirrel et al. (2021), the literature was analyzed by conducting the database queries, removal of duplicates, reading by title, abstract and full text. Relevant papers have gone through the procedure; irrelevant papers were eliminated. Thus, finally 17 papers set

the foundation for the further analysis for this study. Figure 1 visualizes the selection of relevant papers.

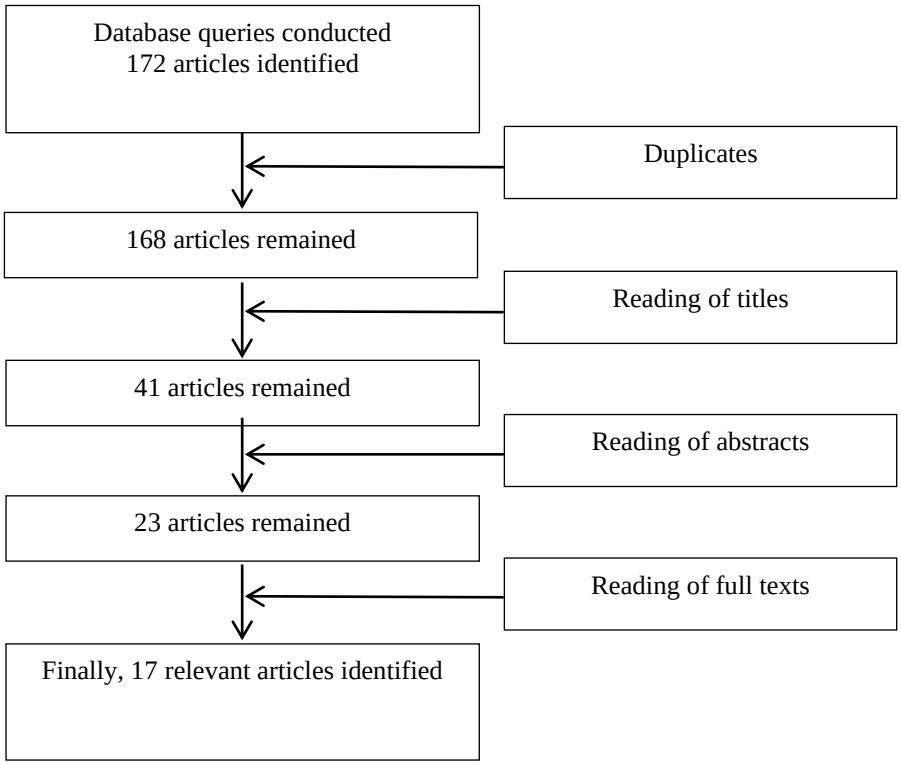


Figure 1. *Research process*

Source: Own depiction based on Tirrel et al. (2021)

Descriptive results of the literature analysis

The descriptive results uncover that 17 relevant papers were identified. All of them were published in peer-reviewed journals. By analyzing the Scopus performance criteria, seven papers were ranked as Q1, eight as Q2 and none as Q3 or Q4 while two papers were not indexed in Scopus. The h-index of the papers varies from 34 to 230. The SJR ranges from .368 to 4.850 (average of 1.2). One paper was listed as ABS 4*, two as ABS 4, three as ABS 2 and six as ABS 1 while five papers were not listed in the ABS journal ranking. Although the last ten years were included in the SLR, the identified papers were published between 2021 and 2025, i.e., the last five years.

Table 1 provides an overview of the identified papers as well as the journal indices.

Authors	Year	Title	Journal	Scopus			ABS
				h-index	Quartile	SJR	
Benlian, A., Pinski, M. and Adam, M.	2025	Team-enacted use vs. developer-needed use of agile practices: how perceptual (in-)congruence and team feedback-seeking shape developer well-being	Information Systems Research	192	Q1	4.850	4*
Junker, T.L., Bakker, A.B., Derks, D. and Pletzer, J.L.	2025	Work engagement in agile teams: extending multilevel JD-R theory	Journal of Organizational Behavior	230	Q1	3.862	4
Junker, T.L., Bakker, A.B., Gorievski, M.J. and Derks, D.	2022	Agile work practices and employee proactivity: A multilevel study	Human Relations	171	Q1	4.148	4
Ng, K., Holman, D., Hayward, S., Johnson, S., Martin, R., Willis, S., Paga, P.	2025	Testing the nomological relationships of a general team agility framework	Journal of Organizational Effectiveness: People and Performance	34	Q2	.877	2
Uraon, R.S., Bharati, R., Sahu, K. and Chauhan, A.	2024	Agile work practices and team creativity: The mediating role of team efficacy	Journal of Organizational Effectiveness: People and Performance	34	Q2	.877	2
Granow, M. and Asbrock, F.	2021	A framework for culturally diverse teams and the importance of agility: Findings from a qualitative study	International Studies of Management & Organization	35	Q2	.368	2
Uraon, R.S., Chauhan, A., Bharati, R. and Sahu, K.	2024	Do agile work practices impact team performance through project commitment? Evidence from the information technology industry	International Journal of Productivity and Performance	83	Q1	.954	1
Hofman, M., Grela, G. and Oronowicz, M.	2023	Impact of shared leadership quality on agile team productivity and project results	Project Management Journal	68	Q1	1.180	1
Bastiaansen, C.A.J. and Wilderom, C.P.M.	2022	Agile and generic work values of British vs Indian IT workers: A culture-clash case	Journal of Strategy and Management	40	Q2	.922	1
Bastiaansen, C.A.J. and	2025	Exploring the effective agile team model: a	Team Performance	44	Q2	.557	1

Vun Dun, D.H.		qualitative mixed-methods study among practitioners	Management: An International Journal				
Krüger, F., Georganta, E., Stein, M. and Lehmann-Willenbrock, N.	2025	Conceptualizing agile teams and investigating relations between team processes and emergent states and agile team performance	Team Performance Management: An International Journal	44	Q2	.557	1
Peeters, T., van de Voorde, K. and Paauwe, J.	2022	The effects of working agile on team performance and engagement	Team Performance Management: An International Journal	44	Q2	.557	1
Wong, S.I. and van Gils, S.	2021	Initiated and received task interdependence and distributed team performance: The mediating roles of different form of role clarity	AI & Society	55	Q1	1.208	-
Rietze, S. and Zacher, H.	2022	Relationships between agile work practices and occupational well-being: The role of job demands and resources	International Journal of Environmental Research and Public Health	229	Q2	.919	-
Strode, D., Dingsøyr, T. and Lindsjorn, Y.	2022	A teamwork effectiveness model for agile software development	Empirical Software Engineering	100	Q1	.895	-
Langholf, V. and Wilkens, U.	2021	Agile project management, new leadership roles and dynamic capabilities - Insights from a case study analysis	Journal of Competences, Strategy & Management	-	-	-	-
Rietze, S. and Zacher, H.	2023	Agile work practices: opportunities and risks for occupational well-being	Gruppe. Interaktion. Organisation. Zeitschrift für angewandte Organisationspsychologie	-	-	-	-

Table 1. *Overview of final papers including journal performance indices as well as ABS ranking*

Source: Own table

Findings

The findings are multifaceted and provide various implications for further research. The results will be discussed first. Second, a structured research agenda will be provided. An overarching result is that no SLR has been conducted before with this research aim, underlining the originality of this study.

Data synthesis

By analyzing the data, four major categories arose: definitions, composition of the team, virtuality, and methodology.

The identified articles will be discussed for each major category with its relevant implications. Referring to the definitions, Strode et al. (2022, p. 40) underline that there is no "shared understanding of concepts in teamwork theory", which is supported by Rietze and Zacher (2022), and that components and mechanisms for the coordination of teamwork are not interrelated. Furthermore, Ng *et al.* (2025) refer to comparable constructs like adaptability, VUCA or lean management.

Referring to the composition of the team, there is an ongoing debate on the differences and similarities of characteristics like empowerment or agility in traditional versus agile teams (Langholf and Wilkens, 2021). This comes in line with the discussion on when there is too much of a good thing, i.e. when agile teamwork is – for instance based on too complex work, no shared mental model, less reflexivity – understood as a burden instead of a benefit (Benlian *et al.*, 2025; Junker *et al.*, 2025; Krüger *et al.*, 2025; Rietze and Zacher, 2023). In addition, the influence of diversity in teams relating to age, gender as well as functional diversity are unknown (Granow and Asbrock, 2021). Bastiaansen and Wilderom (2022) highlight agile mindsets are the foundation for agile teamwork. However, role conflicts arise while a focus on individual needs is desired (Bastiaansen and Van Dun, 2025; Benlian *et al.*, 2025; Junker *et al.*, 2025; Ng *et al.*, 2025). Furthermore, globalization enhances mixed teams with team members from different nationalities with various cultural backgrounds (Bastiaansen and Wilderom, 2022; Granow and Asbrock, 2021; Krüger *et al.*, 2025). Additionally, team members stem from a variety of organizations/industries or business units (Bastiaansen and Wilderom, 2022; Granow and Asbrock, 2021; Krüger *et al.*, 2025) while the focus is on white collar workers (Ng *et al.*, 2025). Various leadership roles also have to be explored (Peeters *et al.*, 2022). Finally, it is unclear how the COVID-19 pandemic has influenced team-related variables like

psychological health (Rietze and Zacher, 2022, 2023). Research tends to focus on positive outcomes of agile teamwork, while disadvantages are less of a topic of discussion (Ng *et al.*, 2025).

Virtuality/technology has been introduced into agile teams especially due to the COVID-19 pandemic (Granow and Asbrock, 2021; Junker *et al.*, 2022; Rietze and Zacher, 2022, 2023). This leads to new and different roles which also arise due to asynchronous communication and since not every team member is very familiar with the digital environment (Wong and Van Gils, 2022). Artificial intelligence, robotics, climate tech and quantum will probably also change the collaboration (Bastiaansen and Van Dun, 2025).

Finally, there are certain findings related to methodology. Causality is often lacking in research on agile teamwork, e.g., since cross-sectional data was used (Junker *et al.*, 2022, 2025; Krüger *et al.*, 2025; Peeters *et al.*, 2022; Rietze and Zacher, 2022; Uraon, Bharati, *et al.*, 2024; Uraon, Chauhan, *et al.*, 2024) which often comes in line with having potentially biased data, i.e., common method bias (Benlian *et al.*, 2025; Junker *et al.*, 2025; Krüger *et al.*, 2025; Peeters *et al.*, 2022; Uraon, Bharati, *et al.*, 2024). Moreover, several time intervals are often not in the limelight (Ng *et al.*, 2025). Validated scales are rare in this context (Hofman *et al.*, 2023). Existing analyses are often bound to specific companies or contexts (Junker *et al.*, 2022; Uraon, Bharati, *et al.*, 2024). Thus, by referring to the composition of the sample, different perspectives which include various viewpoints from different roles (also outside the team), industries, nationalities intra- or inter-team aspects are lacking in existing studies (Bastiaansen and Van Dun, 2025; Granow and Asbrock, 2021; Junker *et al.*, 2022, 2025; Rietze and Zacher, 2022; Uraon, Bharati, *et al.*, 2024; Wong and Van Gils, 2022). Regarding the sample size, previously generated data and derived results were often limited in terms of representativeness due to small samples (Hofman *et al.*, 2023; Rietze and Zacher, 2023; Wong and Van Gils, 2022). Moreover, agile practices are studied in a bundle, assuming synergies between the individual effects (Peeters *et al.*, 2022). Generally speaking, different methodologies, like mixed methods, multi-level analysis or observations were seldom applied (Bastiaansen and Van Dun, 2025; Bastiaansen and Wilderom, 2022; Rietze and Zacher, 2023; Uraon, Bharati, *et al.*, 2024).

Future research agenda

Based on the four categories developed beforehand, now the research agenda will be derived. Thus, there are different gaps in existing research on the definitions. Therefore, it is necessary

to create precise definitions for the various concepts in relation to the theory of teamwork (Rietze and Zacher, 2022; Strode *et al.*, 2022) and to analyze the impact of relevant factors like trust, communication and shared mental models on factors of agile teamwork in order to generate basic knowledge of the relationships (Strode *et al.*, 2022). Furthermore, the definition has to be distinct from VUCA, adaptability and lean management (Ng *et al.*, 2025).

Referring to the composition of the team, it has to be analyzed if agile or traditional teams are superior (Langholf and Wilkens, 2021). To do so, team and individual performance indicators have to be analyzed, like organizational citizenship behavior (Uraon, Chauhan, *et al.*, 2024). Then, the influence of agile teamwork on the performance indicators enables a comparison between traditional and agile teams. This comes in line with analyzing when a burden overweighs the benefits of agile teamwork, i.e. when there is too-much-of-a-good-thing (Rietze and Zacher, 2023). Thus, task characteristics as well as needs of team members have to be analyzed regarding their (in)congruence (Benlian *et al.*, 2025), which could influence role conflicts (Bastiaansen and Van Dun, 2025; Junker *et al.*, 2025; Ng *et al.*, 2025). Moreover, the time of working agile in combination with shared mental models, team reflexivity as well as performance and empowerment has to be analyzed (Krüger *et al.*, 2025). Additionally, agility in blue collar workers teams has to be analyzed (Ng *et al.*, 2025). New insight on how various industries or diversity-related variables affect agile teamwork are necessary (Granow and Asbrock, 2021; Krüger *et al.*, 2025). In addition, it needs to be researched how organizations can create an agile mindset, i.e., setting the foundation for agile teamwork (Bastiaansen and Wilderom, 2022), e.g., in interactions like meetings (Krüger *et al.*, 2025). Since globalization is on the go, the impact of different cultures, e.g., nationalities, has to be analyzed (Bastiaansen and Wilderom, 2022; Granow and Asbrock, 2021). As agile teamwork is still focusing on positive aspects, researching disadvantages has to be more in the focus of future analysis (Ng *et al.*, 2025).

The impact of virtuality/technology on new roles in these virtual settings is still lacking (Wong and Van Gils, 2022). Moreover, the nexus between agile work as well as performance in virtual teams is underresearched (Granow and Asbrock, 2021; Junker *et al.*, 2022; Rietze and Zacher, 2023). Thus, after the COVID-19 pandemic new research is necessary, which could even be replications of studies conducted during the pandemic (Rietze and Zacher, 2022). These studies should also analyze the (psychological) well-being of team members (Rietze and Zacher, 2022). Finally, new technologies like artificial intelligence or robotics have to be analyzed (Bastiaansen and Van Dun, 2025).

Finally, implications for further research regarding methodology, i.e., methodological shortcomings, are presented. Studies should concentrate on conducting experimental or longitudinal studies, so causality is no longer lacking (Bastiaansen and Van Dun, 2025; Benlian *et al.*, 2025; Junker *et al.*, 2022, 2025; Krüger *et al.*, 2025; Rietze and Zacher, 2022; Uraon, Bharati, *et al.*, 2024; Uraon, Chauhan, *et al.*, 2024). In addition, qualitative analysis should be conducted in order to gain more in-depth insights on certain phenomena, related to agile teamwork (Rietze and Zacher, 2022). Moreover, future studies have to rule out methodological biases like the common method bias (Junker *et al.*, 2025; Krüger *et al.*, 2025; Peeters *et al.*, 2022; Uraon, Bharati, *et al.*, 2024; Uraon, Chauhan, *et al.*, 2024) and to identify perfect time intervals for multiple data generations (Ng *et al.*, 2025). New studies should focus on debating different viewpoints, not only discussing one, like those of different team members with various cultural backgrounds (Granow and Asbrock, 2021; Junker *et al.*, 2022; Krüger *et al.*, 2025; Peeters *et al.*, 2022; Wong and Van Gils, 2022). Furthermore, agile teamwork across the boundaries of companies or even industries should be analyzed (Junker *et al.*, 2022; Rietze and Zacher, 2022; Uraon, Bharati, *et al.*, 2024). In addition, new scales need to be developed, as the foundation for quantitative analysis (Hofman *et al.*, 2023). Then, mediation and moderation analysis of certain intervening factors should be performed (Benlian *et al.*, 2025; Peeters *et al.*, 2022; Uraon, Bharati, *et al.*, 2024; Uraon, Chauhan, *et al.*, 2024). By doing so, it is recommended to rather rely on leader ratings, instead of self-ratings from the team (Uraon, Chauhan, *et al.*, 2024) or even combine both ratings and compare them in multi-level, also intra-/inter-team, analyses (Bastiaansen and Van Dun, 2025; Benlian *et al.*, 2025; Junker *et al.*, 2025; Rietze and Zacher, 2022). Moreover, if team-level data is analyzed, the team has to fulfill the questionnaire instead of using self-reported perceptual individual-level data (Uraon, Bharati, *et al.*, 2024). Finally, agile practices have to be analyzed individually in order to identify interaction effects between those practices, leading to a more detailed empirical foundation (Peeters *et al.*, 2022).

Limitations

This study has some limitations. First, an SLR is not capable of analyzing all the available literature due to its inclusion and exclusion criteria. Therefore, relevant papers might have been missed based on the aforementioned criteria. Second, this study yielded a limited number of relevant papers due to its very narrow search string. Thus, familiar literature might not have been included in this analysis. Third, one relevant database has been chosen which is

considered of being representative. However, other relevant papers might exist which were published elsewhere. Consequently, further literature or bibliometric analyses are recommended with other, and broader, in-/exclusion criteria. Nevertheless, a solid body of literature has been analyzed, leading to a comprehensive picture of the status quo.

Conclusion

In conclusion, the literature reviewed reveals significant gaps in our understanding of agile teamwork, spanning definitions, team composition, the influence of virtuality and methodological approaches. To address these gaps, further research needs to refine theoretical frameworks, explore the contextual nuances of diversity and globalization, and deepen insights into agile mindsets and virtual team dynamics. From a methodological perspective, the application of longitudinal and experimental designs, the elimination of biases and the development of robust measurement scales are essential to advance the field. By integrating different perspectives and contexts, future studies can provide a comprehensive and viable foundation for improving agile teamwork practices and outcomes. Then, research and practice will have a better basis for undergoing the agile transformation process.

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MOBILE APPLICATIONS AND MARKETING COMMUNICATION: A CASE OF PROLIFE PET RESCUE

Mulder, Dalmé[1]; Parkes, Whanita[2]

[1]Department of Communication Science, University of the Free State, Bloemfontein, South Africa

[2]Department of Communication Science, University of the Free State, Bloemfontein, South Africa

Keywords: Mobile applications, marketing communication, stakeholder engagement, South African nonprofit organizations, animal welfare

Introduction

In South Africa, the most common forms of animal cruelty are restriction of movement, food and water deprivation, assault, neglect, and lack of medical care. Education and community initiatives to address this issue and focus on the responsibility of pet ownership should therefore be a priority. Due to a lack of government support for this matter in South Africa, private NPOs offer financial assistance and support towards animal welfare, caring for neglected or abused animals. One such NPO, Prolife Pet Rescue, recognized the need for a pro-life animal sanctuary.

Purpose, Aim and Objectives

Due to the unsupportive environment in which NPOs in South Africa operate, support from the local community and other stakeholders is critically needed. This study explored how a mobile application can strengthen communication within the nonprofit sector, using Prolife Pet Rescue as a case study. The research investigated stakeholder perceptions and communication needs and explored the best way to integrate a mobile application into the NPO's marketing communication strategy.

Literature Review and Theoretical Framework

An integrated marketing communication (IMC) approach served as the point of departure and theoretical framework for this study. As stakeholder-centered, interactive process of cross-functional planning and alignment of organizational, analytical, and communication methods, it enables dialogue by communicating consistent messages across all media to support long-term relationships that create value. By embracing interactivity through a mobile application (app), a welfare organization can use it as a direct communication tool with the community, enabling two-way communication. As the Uses and Gratifications Theory's components reflect the influence of social media content on engagement behaviors, it was employed as a theoretical lens in the study. This study also utilized the two-way symmetrical model within the excellence theory as a framework for creating excellence between the organization and its public. Insights from the uses and gratifications theory assist in formulating communication for excellence, as described by the excellence theory. For an NPO to achieve its goals, it must communicate with the public to convince them to partake in its cause. Therefore, public relations (PR) is critical for nonprofit organizations (NPOs) to help build awareness, establish credibility, attract donors and volunteers, and enhance public engagement.

Methodology and Methods

The research was conducted within an interpretivist worldview and constructivist ontology. A qualitative research approach, conducting 12 semi-structured face-to-face interviews with key stakeholders, was followed. A non-probability, purposive sample was drawn from staff, volunteers, foster parents, and donors of Prolife Pet Rescue in the Nelspruit area, South Africa. The sample size was determined by theoretical saturation. The semi-structured interviews were conducted using an interview schedule, formulated to include relevant concepts and constructs derived from a conceptual analysis and literature review. Clarke and Braun's (2022) thematic analysis was used to analyze patterns of meaning within the qualitative data. An inductive approach was used to identify themes from the data, grounded in participants' experiences and views expressed in the semi-structured interviews. Deductive reasoning was also utilized to situate the findings within the broader theoretical context and to draw on uses and gratifications theory. The researcher triangulated multiple sources to justify the themes identified across participants. Furthermore,

member checking was conducted through a follow-up interview with participants to assess the accuracy of the interpretation.

Findings and contribution

The thematic analysis produced six main themes. The findings indicated that existing communication practices are fragmented, inconsistent, and reactive, resulting in missed opportunities for donor engagement, adoption processes, and foster parent support. Stakeholders called for transparent, centralized, and timely communication, explicitly stating that a mobile application is the preferred solution. The study concluded that mobile applications could support stakeholder engagement, strengthen organizational communication, and support sustainable growth in the nonprofit sector. Practical guidelines were proposed to support Prolife Pet Rescue or similar NPOs in implementing a mobile application as a distribution hub to direct users to events, rescue updates, donation appeals, and volunteer drives, integrated with the marketing communication strategy.

Originality and Value

The study provides recommendations for developing a practical mobile application for Prolife Pet Rescue, specifically, and for NPOs in general. Recommendations address the application's development and operational phases, as well as key performance indicators, to better utilize the mobile application and strengthen communication between an NPO and its stakeholders.

Theoretical and Practical Applications and Implications

The findings may help managers and PR practitioners improve marketing communication to support long-term stakeholder engagement in the NPO industry.

UNDERSTANDING SOCIAL MEDIA MARKETING ADOPTION IN INDUSTRIAL CONTEXTS: A QUANTITATIVE ANALYSIS OF PERCEIVED BENEFITS AND BARRIERS

Chroni, Zoe Maria

School of Business & Creative Industries, University of the West of Scotland, Paisley, United Kingdom

Keywords: B2B social media marketing, technology adoption, benefits, barriers, Greece

Introduction

Traditional industrial marketing is undergoing a digital transformation, moving from personal selling to digital engagement. While social media marketing is primarily a Business-to-Consumer (B2C) tool (Katona and Sarvary, 2014), its strategic importance in B2B is now recognised (Balaji *et al.*, 2023). However, there is a scarcity of empirical evidence (Dwivedi *et al.*, 2021) in the B2B context, leaving a gap regarding organisational enablers and challenges of adoption. This study addresses this gap by examining perceived benefits and barriers in the Greek B2B sector.

Purpose, Aim and Objectives

This study examines the perceived benefits and barriers influencing B2B Greek companies to adopt social media marketing. The main research objectives are: 1) to examine key benefits of adoption; 2) to identify main barriers hindering adoption; and 3) to provide practical insights for Greek B2B practitioners.

Literature Review

Benefits include new customers attraction, brand awareness, enhanced customer relationships (Michaelidou, Siamagka and Christodoulides, 2011), and lead generation (Itani, 2024). Barriers include lack of knowledge and technical skills (Asamoah, Dinsmore and Swani, 2024), inadequate financial resources (Gazal *et al.*, 2016) and lack of ROI measurement (Dwivedi *et al.*, 2021).

Methodology and Methods

The study adopted a quantitative research design using an online survey with managers and business owners from Greek B2B companies. Participants were recruited via simple random sampling from an official Greek business directory. A total of 72 participants completed the survey, with measurement scales adapted from previous literature. Descriptive statistics and ANOVA were used to analyse the data.

Findings and Contribution

Greek B2B companies rated advertising (M=4.39), marketing (M=4.34), and brand reputation (M=4.07) as the most significant benefits, with no significant differences between adopters and non-adopters. Lack of financial resources was the most significant barrier (M=3.82). ANOVA revealed significant differences between adopters and non-adopters for lack of time, company size, ROI measurement, and lack of social media strategy (all $p<0.5$), with non-adopters rating these barriers significantly higher.

Originality and Value

This study focuses on Greece, a country that has been in a prolonged recession since 2010 and traditionally resistant to technology adoption (Giotopoulos *et al.*, 2017), contributing empirical evidence to an underexplored B2B context. The findings provide a foundation for future cross-national comparisons across European countries.

Research Limitations

The sample size (n=72) and single-country focus limits generalisability of the findings. Future research could expand to other European markets.

Theoretical and Practical Applications and Implications

The findings suggest organisations should recognise social media's potential for brand building while addressing financial and strategic planning barriers. Practitioners could develop targeted interventions for non-adopters, focusing on ROI measurement training and resource allocation strategies to overcome the identified barriers.

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THE IMPACT OF SOCIAL MEDIA PLATFORMS ON INFLUENCER-FOLLOWER RELATIONSHIPS

Silva, Patrícia[1]; Mendes, Mafalda[2]

[1]BRU, ISCTE, Lisbon, Portugal

[2]BRU, ISCTE, Lisbon, Portugal

Keywords: Influencer Marketing, Parasocial Relationships, Sponsored Posts, Trust, Social Media Platforms, Content Length.

Introduction

Influencer marketing relies on opinion leaders to drive brand awareness and purchase intention (Lou and Yuan, 2019). Sponsorship-disclosure laws require influencers to flag paid content, which can erode trust in an influencer previously perceived as authentic, although followers may instead see sponsorships as a trusted influencer recommending brands they genuinely enjoy. Prior research links sponsorship reception to relationship depth and to congruence between a sponsored post and an influencer's usual content (De Cicco et al., 2020; Belanche et al., 2021), largely independently of platform, despite platforms differing substantially in format, pacing and content length. This study addresses that gap, asking whether platform characteristics, and content length specifically, shape relationship strength and, in turn, follower reception of sponsored posts.

Purpose, aim and objectives

The study aimed to understand whether platform characteristics influence follower reception of sponsored beauty content, and how the influencer-follower relationship affects that reception: "What impact does the platform on which sponsored beauty content is posted have on followers' perceptions of the influencer and the sponsored post?". The premise is that fast-paced, short-form platforms may not elicit the emotional engagement that longer formats can.

Literature review and theoretical framework

Influencer marketing "uses the influence of key individuals or opinion leaders to drive consumers' brand awareness and/or purchasing decisions" (Lou and Yuan, 2019, p. 59). Authors have flagged platform differences as a likely factor shaping empirical results, calling

for further research (Jiménez-Castillo and Sánchez-Fernández, 2019). Drawing on parasocial relationship theory and source credibility literature, this study treats platform and content length as contextual affordances conditioning parasocial bond depth and, consequently, trust resilience once a sponsorship is disclosed, extending congruence and disclosure-transparency research (Belanche et al., 2021; De Cicco et al., 2020) by treating disclosure reception as platform-contingent, not platform-neutral.

Methodology and methods

This exploratory study used an asynchronous online survey to examine platform characteristics (content length), influencer-follower relationships, and follower reception of sponsored posts across Instagram, TikTok and YouTube. Hosted on Google Forms and distributed mainly through online forums, the survey included three multiple-choice and five open-ended questions, taking roughly ten minutes. Data were collected from 22 November 2022 to 7 January 2023 from 55 participants who consumed beauty content across multiple platforms. Multiple-choice items were analysed descriptively; open-ended responses were examined through thematic content analysis to identify recurring patterns around trust, authenticity and platform format. Given the modest, predominantly female sample, findings are indicative patterns, not statistically generalisable effects.

Main findings and contribution

Descriptive and thematic patterns point to platform characteristics shaping the influencer-follower relationship. Trust emerged as the central mechanism linking format to receptiveness: longer-form content appeared to foster greater intimacy and authenticity, sustaining trust once sponsorship was disclosed. Most participants reported researching products further to verify quality; reputable brands left the relationship largely unaffected, whereas low credibility and inauthentic-seeming posts were linked to declining trust. These patterns suggest disclosure effectiveness is platform-contingent rather than platform-neutral.

Originality and value

The contribution lies in reframing platform and content length as theoretically meaningful contextual conditions, not incidental features, in parasocial relationship and disclosure research, offering an exploratory account of how content format can sustain or erode trust under sponsorship.

Research limitations

As an exploratory, qualitative-leaning study with 55 participants, predominantly women, and a deliberate focus on the beauty niche, findings are not statistically generalisable; these scoping choices allowed depth into an underexamined relationship. Larger, more diverse samples can test the mechanism proposed.

Theoretical and practical applications/implications

Theoretically, the study links platform format to trust resilience under sponsorship, extending parasocial relationship and disclosure literature. Practically, brands may find longer-form-content influencers, particularly on YouTube, better positioned to sustain follower trust when disclosing sponsorships, with the mechanism potentially extending to other influencer marketing sectors beyond beauty.

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SHOULD BRANDS TAKE A STAND? THE IMPACT OF BRAND ACTIVISM ON CONSUMER RESPONSES: THE ROLE OF MESSAGE SOURCE AND PERCEIVED AUTHENTICITY

Ezerskyte, Auguste[1]; Venciute, Dominyka[1]; Correia, Ricardo[2]; Kuslys, Marius[1]

[1]ISM University of Management and Economics, Vilnius, Lithuania

[2]Polytechnic Institute of Bragança, Bragança, Portugal

Keywords: Brand Activism, Brand Attitude, Brand Trust, Purchase Intention, Perceived Authenticity

Introduction and Theoretical Background

In today's competitive market industry, consumers are expecting brands to take a stand on various social and political issues, making brand activism an increasingly important element of contemporary marketing strategies (Wang and Bouroncle, 2024). Brand activism occurs when companies align their communication and corporate actions with specific sociopolitical causes, aiming to create social change and improve brand equity (Vredenburg et al., 2020; Key et al., 2023). While brand activism is a multifaceted concept, existing research primarily focuses on environmental and socio-cultural issues tied to specific societal contexts. As a result, high-intensity and globally relevant forms of brand activism, such as war, societal equality, and human rights, remain underexplored. Previous research has also emphasized the importance of the message source in brand activism, as communication by different representatives of the brand yields different results in consumer responses and behavior (Nam et al., 2023). However, in the context of sensitive causes such as war, a research gap remains.

The aim of this research was to examine the effect of brand activism on brand attitude, brand trust, and purchase intention, while also analyzing the mediating role of perceived authenticity and the moderating effects of message source and generation, using the war in Ukraine as the contextual case.

The key constructs used in this research were: brand activism as the independent variable, represented as Facebook posts with a specific stand on war in Ukraine; brand attitude, analyzing whether exposure to brand activism changes the way consumers perceive the brand

in question; brand trust, analyzing the impact of brand activism on changes in the level of trust from the consumer to the brand; purchase intention, analyzing how exposure to brand activism changes the willingness to buy products from the brand; perceived authenticity, included as a possible mediator variable to analyze whether any connection between brand activism and consumer responses are affected by how authentic the brand is perceived by the customer; message source and generation, chosen as variables that might have moderating effects on the relationships between the independent and dependent variables.

Methodology

An online experiment was performed in 3 separate stages. In Stage 1, the pre-test identified war in Ukraine and threats to independency as the most concerning issue for the sample, which was later used as a context for Studies 1 and 2. Study 1 further analyzed the effect of separate brand activism scenarios on the sample. Study 2 was performed on a separate sample to analyze the moderation effects of the message source and generation. The data was processed and analyzed using non-parametric tests and PROCESS Macro in SPSS software.

Results

The results of the study did not support the hypotheses raised, although additional analysis imposed perceived authenticity to be the main predictor of consumer responses. Additionally, the analysis revealed the importance of the appropriate choice of context for brand activism, as war in Ukraine resulted to be too emotionally charged and sensitive issue, which shifts consumer focus and decision-making process to a more survival-based approach.

Theoretical and Managerial Contributions

This is the first study to acknowledge the possible impact of brand activism in the context of an ongoing war in Ukraine. It connects the analysis of consumer responses and reactions with the growing concept of brand inclusion in social activities and communications. Given the study’s limitations, future research should replicate the study in different geographical contexts, increase the sample size, and further clarify the brand activism message.

The discovered results underscore the importance for brands to have long-term strategies for transparency, communicating values and building brand trust.

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TRUST, TRANSPARENCY, AND CONSUMER LEARNING IN BIOECONOMY MARKETS: EXPLAINING THE GAP BETWEEN ECOLOGICAL AWARENESS AND PURCHASE DECISIONS IN AGRIFOOD SYSTEMS

Chkoniya, Valentina[1]; Abreu, Madalena[1,2]; Quintas Medina da Silva, Inês[1]; Alturas, Bráulio[3]

[1]Polytechnic University of Coimbra, Coimbra, Portugal

[2]CEOS.PP Coimbra, Polytechnic University of Coimbra, Coimbra, Portugal

[3]Information Science and Technology, University Institute of Lisbon (ISCTE-IUL), ISTAR-ISCTE, Lisbon, Portugal

Keywords: Bioeconomy, Sustainable Consumption, Agrifood Business, Consumer Learning, Trust, Transparency, Greenwashing, Purchase Decision

Introduction

The transition towards a bioeconomy is reshaping agrifood markets by embedding sustainability attributes into product value propositions. However, the proliferation of environmental claims can increase consumer scepticism where sustainability information is difficult to verify or perceived as greenwashing. Consequently, a persistent gap remains between ecological awareness and actual purchasing behaviour.

Purpose, Aim and Objectives

This study examines how consumers interpret, evaluate and act upon sustainability information in agrifood markets. It aims to explain how consumer learning, transparency and trust influence the translation of ecological awareness into purchasing decisions. Specifically, it explores how consumers evaluate sustainability signals, develop trust, identify potentially misleading claims, and reconcile sustainability preferences with price considerations.

Literature Review and Theoretical Framework

The study integrates sustainable consumption theory with perspectives on information asymmetry, consumer learning, and greenwashing. Akerlof (1970) demonstrates that consumers rely on market signals when product quality cannot be directly verified. In sustainable consumption, labels, certifications and brands therefore become important signals, while greenwashing can undermine their credibility (Delmas and Burbano, 2011). Consumer learning provides a complementary perspective, positioning consumers as active evaluators of sustainability information, with trust acting as a key mechanism in decision-making (Grunert, 2019).

Methodology and Methods

A qualitative design was adopted using semi-structured interviews with agrifood consumers representing diverse socio-demographic profiles. Data were analysed through systematic thematic analysis, focusing on trust formation, perceived authenticity, interpretation of sustainability signals, greenwashing and price sensitivity.

Findings and Contribution

The findings indicate that ecological awareness alone does not consistently generate sustainable purchasing. Trust emerges as a central mechanism linking awareness to behaviour and is strengthened by transparent, credible and verifiable information. Consumers with higher education and greater travel experience demonstrate more sophisticated evaluative strategies, whereas vague or unverifiable claims reinforce perceptions of greenwashing. Price sensitivity remains an important constraint. These findings integrate information asymmetry, consumer learning and trust into an explanation of the awareness–behaviour gap (Anisimova and Vrontis, 2024; Chaudhuri *et al.*, 2025; Chkoniya, 2025).

Originality and Value

The study contributes a learning-based perspective to sustainable consumption by conceptualising transparency as an enabling condition for consumer learning and trust. It extends understanding of how bioeconomy-oriented markets can facilitate informed consumer participation (Sabbagh *et al.*, 2024).

Research Limitations

The qualitative design and reliance on reported perceptions limit the generalisability of the statistical findings. Future research should quantitatively test the proposed relationships across consumer groups and agrifood categories.

Theoretical and Practical Applications and Implications

The findings suggest that firms should move beyond symbolic sustainability positioning towards transparent, accessible and verifiable communication. Policymakers should strengthen environmental-claim regulation and sustainability literacy to reduce information asymmetries and support informed participation in bioeconomy transitions.

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HUMAN-AI INTERACTION TYPES IN ACADEMIC KNOWLEDGE CREATION: EVIDENCE FROM SYSTEMATIC LITERATURE REVIEWS

Tomczyk, Przemysław[1]; Vrontis, Demetris[2]

[1]Department of Marketing, Kozminski University, Warsaw, Poland

[2]Department of Management, School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Human-AI Interaction, Knowledge Co-creation, Generative AI, Systematic Literature Reviews, Epistemic Agency, Knowledge Management, Academic Writing, Governance.

Introduction

Generative artificial intelligence (GenAI) is reshaping academic knowledge production by supporting retrieval, screening, synthesis and writing. Systematic literature reviews (SLRs) are an appropriate context for examining this change because they combine procedural transparency with interpretive judgement.

Purpose, Aim and Objectives

The purpose of this study is to examine GenAI-enabled knowledge co-creation in SLR-based academic writing. The aim is to develop a typology of human-AI interaction based on decision-making delegation, iterative dialogue and epistemic responsibility. The research question is: How can human-AI interaction in SLRs be typologised from a knowledge co-creation perspective?

Literature Review and Theoretical Framework

The framework integrates knowledge creation theory (Nonaka, 1994), evidence-informed SLR methodology (Tranfield et al., 2003; Page et al., 2021), and research on human-AI interaction, trust, delegation and augmentation (Jarrahi, 2018; Amershi et al., 2019; Glikson and Woolley,

2020; Baird and Maruping, 2021; Raisch and Krakowski, 2021; Dwivedi et al., 2023; Dell'Acqua et al., 2026).

Methodology and Methods

The study adopted a systematic literature review design. Peer-reviewed publications indexed in Scopus and Web of Science were identified through keyword searches and citation tracking. The material was analysed using deductive thematic analysis guided by two dimensions: delegation to AI and bidirectional human-AI dialogue.

Findings and Contribution

The analysis identifies three interaction types. The AI-supported type describes automation of repetitive tasks under full human control. The collaborative type involves iterative prompting, critique and refinement without transferring decision authority. The partner-like type involves partial delegation of analytical or synthesis-related decisions under human oversight. The types form a continuum from instrumental assistance to quasi-epistemic partnership.

Originality and Value

The study conceptualises SLRs as sites of human-AI knowledge co-creation rather than merely AI-assisted workflows. The typology clarifies how GenAI changes the distribution of agency, responsibility and judgement in academic writing.

Research Limitations

The study is limited by its reliance on English-language publications indexed in Scopus and Web of Science and by uneven transparency in reporting AI use.

Theoretical and Practical Applications and Implications

Theoretically, the findings extend knowledge co-creation theory by incorporating non-human agents into epistemic processes. Practically, the typology can support researchers, universities

and journal editors in developing transparent reporting standards and responsible governance mechanisms for GenAI-assisted research.

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FROM QUESTIONNAIRES TO QUERIES: TESTING THE EQUIVALENCE OF HUMAN AND LLM-GENERATED SURVEY DATA

Tirrel, Henning[1]; Fröbel, Daniel[2]

[1]Faculty of Business, Ostfalia University of Applied Sciences, Wolfsburg, Germany

[2]IU International University of Applied Sciences, Münster, Germany

Keywords: Silicon Sampling, Large Language Model, LLM, Generative Artificial Intelligence, AI, Sampling, Synthetic Datasets, Survey

LLMs are founded on large databases, including texts, and analyse data based on a priori trainings (OpenAI, 2023; Sarstedt *et al.*, 2024). Furthermore, human behaviour can be imitated by LLMs (Hermann and Puntoni, 2025; Jeon *et al.*, 2024; Luo *et al.*, 2022). Consequently, LLMs have the power to re-order researcher processes. LLMs are used as dataset suppliers, instead of humans (Argyle *et al.*, 2023; Dillion *et al.*, 2023; Hermann and Puntoni, 2025; Sarstedt *et al.*, 2024). These are called synthetic datasets (Sarstedt *et al.*, 2024) or silicon sampling methodology (Argyle *et al.*, 2023). If demographic data is included as an input, i.e., informing the LLM about which characteristics the sample should comprise, it is called silicon sampling and without these information it is called random silicon sampling (Sun *et al.*, 2024).

Besides first promising analysis, showing that LLMs are capable of replacing humans (cf. Argyle *et al.*, 2023; Dillion *et al.*, 2023; Li *et al.*, 2024; Sarstedt *et al.*, 2024), there is also the other empirical evidence (Schröder *et al.*, 2025). Thus, this innovative and important topic leads to open calls for more knowledge on how silicon sampling works in various research settings (Sarstedt *et al.*, 2024; Sun *et al.*, 2024). This study, therefore, aims at discovering if (random) silicon samples from different LLMs are comparable to humans fulfilling a questionnaire as a follow up study of Tirrel (2025). This leads to the following research question: How do results from (random) silicon sampling data and data generated from real participants differ?

A previously traditionally generated dataset will be used as a foundation for answering the research question. Additionally, various LLMs will be used for generating (random) silicon samples. Thus, various datasets will be compared via multivariate analysis, e.g., Kruskal-Wallis test. As a result, it is possible to identify differences or similarities between two or more

different samples, i.e., to determine whether synthetic datasets are comparable to human-generated data.

This study contributes to knowledge by analysing if (random) silicon samples differ from traditional samples or if they can substitute the original ones. Thus, implications of whether (random) silicon samples can change the way of data generation in the future can be drawn in this highly innovative research area. Potential practical implications of the study include a more efficient design of empirical research processes through the use of LLMs for generating synthetic samples. In particular, time and cost issues associated with traditional data generation may be reduced. Furthermore, (random) silicon samples could be used as a practical complement to conventional data generation, especially in early research stages such as pretest, pilot studies or exploratory analyses, as long as they deliver results that are comparable to those generated by humans.

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DO ESG SCORES MOVE MONEY? EVIDENCE FROM U.S. EQUITY ETFS

Sapuric, Svetlana[1]; Georgiou, Ifigenia[2]; Repousis, Spyridon[3]; Lois, Petros[4]

[1]Associate Professor, Department of Accounting, Economics and Finance, School of Business, University of Nicosia, Cyprus
[2]Associate Professor, Department of Accounting, Economics and Finance, School of Business, University of Nicosia, Cyprus
[3]Adjunt Faculty, Department of Accounting, Economics and Finance, School of Business, University of Nicosia, Cyprus
[4]Professor, Department of Accounting, Economics and Finance, School of Business, University of Nicosia, Cyprus

Keywords: ESG, Exchange-Traded Funds, Fund Flows, Holdings-Based ESG, ESG Ratings, Controversies, Sustainable Investing, Investor Behaviour

Introduction

Interest in environmental, social and governance (ESG) investing continues to expand, yet it remains uncertain whether investors respond to the actual ESG characteristics of portfolios or primarily to labels and marketing narratives (Riedl and Smeets, 2017; Baker et al., 2022). A key challenge highlighted in the literature is the substantial divergence among ESG rating providers, which limits comparability and raises questions about what ESG measures truly capture (Berg, Kölbel and Rigobon, 2022). At the same time, evidence suggests that sustainability-related classifications can strongly influence capital flows, often independent of performance metrics (Hartzmark and Sussman, 2019).

To advance this discussion, our study investigates whether investor flows into U.S. equity exchange-traded funds (ETFs) respond to holdings-based ESG levels, changes in ESG, and controversy exposure, rather than solely to branding. ETFs are well suited to this question because they operate under a transparent framework with frequent holdings disclosure, facilitating precise measurement of portfolio attributes over time (Madhavan, 2016).

Literature Review and Theoretical Framework

Research on ESG ratings documents large methodological differences across major providers, driven by variation in measurement choices, indicator scope and weighting schemes (Berg, Kölbel and Rigobon, 2022, Gibson Brandon et al., 2022). These discrepancies complicate inference about whether ESG quality influences investor decisions and reinforce the need for transparent, portfolio-level measurement.

Meanwhile, work on sustainable fund flows shows that investors do react to changes in perceived sustainability (Hartzmark and Sussman, 2019; Bauer, Ruof and Smeets, 2021). In the U.S. mutual fund market, sustainability classifications have been shown to trigger large scale reallocation of capital, even when the classifications do not predict better performance (Hartzmark and Sussman, 2019). This evidence motivates our focus on whether investors respond to changes in the underlying ESG composition of portfolios.

Methodology and Methods

Our analysis uses U.S. equity ETFs and combines three categories of data: (1) fund-level net flows and assets under management; (2) periodic ETF holdings including constituent weights; and (3) issuer-level ESG information, including overall ESG scores, pillar scores and controversy indicators (Dorfleitner et al., 2015).

For each ETF at each holdings date, we construct a set of portfolio ESG measures by weighting the ESG assessments of constituent companies by their portfolio weights. We then track how shifts in these portfolio characteristics relate to subsequent investor flows. By aligning ESG measurement as of the portfolio disclosure date and analysing flows after that date, we ensure a meaningful temporal sequence suitable for inference.

Our empirical approach relies on a panel design that adjusts for key fund attributes such as size, past returns and product characteristics. The transparency of the ETF regulatory framework, established through the modernised rules governing ETF operations, supports consistent measurement by promoting frequent disclosure of holdings and standardising operational practices (Securities and Exchange Commission, 2019). This setting allows us to test whether investors genuinely respond to measured ESG quality rather than labels alone.

Expected Findings and Contribution

We expect several patterns to emerge. First, ETFs with higher portfolio ESG levels are likely to experience increased subsequent inflows, reflecting the growing appeal of sustainability-aligned portfolios. Second, improvements in portfolio ESG are expected to attract inflows, while deteriorations and higher controversy exposure are expected to prompt outflows (Krüger, 2015). Prior work suggests that negative ESG events often have a stronger effect than positive ones, implying that investor responses may be asymmetric (Krüger, 2015; Capelle-Blancard and Petit, 2019).

We also anticipate stronger ESG-related flow sensitivities for ETFs that explicitly position themselves as sustainable. This would suggest that label salience amplifies investor attention to underlying ESG characteristics.

The key contribution of this study lies in using dynamic, holdings-based ESG measurements to assess whether investors respond to measured portfolio ESG quality. This approach directly addresses calls for more transparent, comparable and time-sensitive ESG metrics and provides evidence on how ESG considerations influence investor behaviour within a highly transparent investment structure.

Research Limitations

Some ETFs disclose holdings less frequently than others, which may introduce mild timing noise. Nevertheless, ETFs remain substantially more transparent than mutual funds, enhancing the reliability of portfolio-level ESG measurement.

Theoretical and Practical Implications

Theoretically, the study contributes to understanding how investors interpret and respond to sustainability information, especially when measured at the portfolio level. Practically, the findings have implications for fund managers, regulators and data providers. If investors respond meaningfully to measured ESG quality, this underscores the importance of transparent ESG reporting and supports efforts to improve ESG data comparability and disclosure standards (Christensen, Serafeim and Sikochi, 2022).

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DO LIMITED TRAFFIC ZONES DECONGEST OR DISPLACE URBAN TOURISM PRESSURE? HOURLY ZONE-LEVEL EVIDENCE FROM MOBILE NETWORK IN ITALY

[1]Sinatra, Alessandro Francesco

[1]Dicar, University of Catania, Catania, Italy

Keywords: Limited Traffic Zones (ZTLs), Network Data, Destination Governance, Urban Mobility Policy

Purpose, Aim and Objectives

Limited Traffic Zones (ZTLs) are increasingly used in European cities to improve liveability and manage access to historic centres, yet destination governance still lacks high-frequency, spatially explicit evidence on whether these measures reduce tourism-related pressure or primarily relocate it to neighbouring areas. This study evaluates the introduction of a ZTL in a Mediterranean city (Italy).

Literature Review and Theoretical Framework

The study builds on the use of passive mobile positioning data for tourism measurement and recent advances in smart destination analytics (Ahas, 2008; Gretzel et al., 2015; Xiang et al., 2015). It also engages with emerging evidence on intra-urban tourism spillover dynamics (Camatti et al., 2024).

Methodology and Methods

The analysis uses two years of hourly, zone-level mobile network aggregates that describe the population present and its composition by origin (Italians vs foreigners; intra- vs extra-region visitors), purpose (consumers vs business), and socio-demographics (gender and age groups). We implement a difference-in-differences design with zone fixed effects and granular temporal controls for hour-of-day, day-of-week, and seasonality. Treated zones within the ZTL perimeter are compared to (i) a neighbouring buffer ring of adjacent zones and (ii) matched control zones elsewhere in the city. Outcomes include consumer-oriented presence, foreign presence, extra-region visitor presence, and a composition-based tourism pressure index contrasting visitor segments against residents and commuters.

Findings and Contribution

Descriptive patterns around the policy change indicate reduced peak-hour consumer and foreign presence within treated zones alongside contemporaneous increases in adjacent zones, consistent with spatial spillovers rather than pure decongestion. These findings mirror emerging evidence on intra-urban tourism spillover dynamics (Camatti et al., 2024).

Originality and Value

By moving beyond overnight-based indicators, the study advances the use of mobile network data for tourism statistics and policy evaluation. It provides high-frequency, spatially explicit evidence on whether access restrictions reduce tourism-related pressure or relocate it to neighbouring urban areas.

Research Limitations

The study focuses on the introduction of a single ZTL in a Mediterranean city (Italy) and relies on two years of hourly, zone-level mobile network aggregates. The findings should therefore be interpreted in relation to the specific spatial, temporal, and policy context examined.

Theoretical and Practical Applications and Implications

The study contributes to smart destination analytics and to the evaluation of place-based urban mobility policies by showing the importance of accounting for intra-urban spatial spillovers. It offers actionable guidance on coordinating enforcement and urban services beyond restricted perimeters (Cavallo et al., 2022).

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EMOTIONAL INTELLIGENCE IN LARGE LANGUAGE MODELS: CAPABILITIES, LIMITATIONS, AND GOVERNANCE IMPERATIVES

Halawi, Ali[1]; Fadel, Kholoud[2]

1Faculty of Business Studies, Arab Open University, Muscat, Oman

2School of Business and Management, UClan University, Larnaca, Cyprus

Keywords: Emotional intelligence, large language models, affective computing, theory of mind, human-AI interaction, AI governance, algorithmic empathy, EU AI Act.

Abstract

This paper examines how far large language models (LLMs) can approximate human emotional intelligence (EQ), and what that approximation means for organisational and regulatory governance. It asks where the boundary lies between affective performance that is convincing in language and the embodied, relational understanding that underpins human empathy. A conceptual research design was adopted because the phenomenon is too emergent for large-scale empirical measurement and because governance frameworks require conceptual clarity before they can be operationalised. To address this, the analysis integrates emotional intelligence theory, theory of mind research, affective computing, and recent scholarship on anthropomorphism, mental-health chatbots, and the EU Artificial Intelligence Act, four strands that converge on a shared problem: what happens when systems that cannot feel become capable enough at the language of feeling to influence how people disclose, trust, and seek help. Health, education, and consumer service were selected as illustrative domains because each combines emotional vulnerability with high deployment rates of conversational AI. From this, the paper develops the SRI framework, a three-level model of emotionally adaptive AI: Signal, Relation, and Influence. Signal refers to the detection of affective cues; Relation refers to context-sensitive adaptation during an interaction; and Influence refers to longitudinal modelling that can shape user behaviour over time. The paper argues that most deployed systems remain concentrated at Signal and early Relation, while Influence is emerging through engagement-driven optimisation rather than through genuine emotional understanding, as evidence from companion applications and personalised retention systems increasingly suggests.

The SRI framework translates an abstract debate about whether AI has empathy into a practical governance map, showing which risk becomes dominant at each level and linking that risk to a specific instrument: measurement validation, disclosure and design restraint, data minimisation, a non-manipulation duty, and independent affective auditing. The result is a decision-ready contribution, grounded in audit-facing criteria and design constraints, for researchers, designers, reviewers, and policy actors who need to evaluate emotionally adaptive AI without either exaggerating or dismissing its capabilities.

Introduction

Consider two near-identical encounters. In the first, a barista greets a regular customer by name, notices that the customer looks tired, and adjusts the conversation with a small act of warmth. In the second, an AI-mediated service does something similar: it recognises the user, recalls previous preferences, reads emotional cues in text or voice, and adapts its response. From the outside, the encounters are beginning to converge. From the inside, they remain fundamentally different. One involves a person who can care, misread, remember, and be morally accountable. The other involves a system that can produce the signs of emotional competence without having emotions at all.

This distinction now matters beyond philosophy. LLMs increasingly mediate customer service, tutoring, health triage, workplace tools, companion applications, and decision support. As systems are tuned to sound patient, attentive, and empathic, organisations face a difficult question: when does emotional responsiveness become a valuable interface feature, and when does it become a misleading simulation of care? The answer is not simply technical. It concerns trust, dependence, vulnerability, and the governance of data about users' inner states.

Recent evidence makes the question sharper. LLMs can perform strongly on tasks that resemble social reasoning, theory of mind, and emotional intelligence testing (Bubeck *et al.*, 2023; Kosinski, 2024; Wang *et al.*, 2023). Schlegel, Sommer and Mortillaro (2025) further show that several LLMs perform very well on ability-based emotional intelligence tests and can generate new test items with psychometric properties comparable to those of human-designed items. At the same time, benchmark work such as EmoBench shows that LLM performance remains uneven when tasks require integrated emotional understanding and application rather than surface-level recognition (Sabour *et al.*, 2024).

The central paradox is therefore clear: LLMs are becoming better at emotional performance before society has agreed how that performance should be interpreted, constrained, or audited.

This paper responds to two gaps. The first is conceptual. Public and scholarly debate often treats machine empathy as a binary question: either systems possess it or they merely fake it. That framing is too blunt for governance. A system that classifies user sentiment once, a tutor that adapts tone over a session, and a companion application that models a user's vulnerability across months do not raise the same risks and cannot be governed by the same instruments. The second gap is practical. Governance discussions frequently restate high-level principles such as transparency, fairness, and accountability, but offer designers and reviewers few tools for deciding which obligation should apply to which emotional capability. Principles without operationalisation leave the hardest decisions unmade.

The paper makes three contributions. First, it proposes the SRI framework. Signal denotes detection of affective cues; Relation denotes adaptive response within an interaction; and Influence denotes longitudinal modelling that can shape future affect and behaviour. Second, it links each level to its dominant risk. Signal is primarily a measurement and bias problem; Relation is primarily an empathy-illusion problem; Influence is primarily a manipulation and dependency problem. Third, it derives a compact set of governance instruments aligned with those risks, including validation of affective measurement, emotional disclosure, design restraint, emotional-data minimisation, a non-manipulation duty, and independent affective auditing. The framework is designed to be useful in product review, ethics review, regulatory assessment, and policy analysis.

Theoretical Framework

The paper draws on four strands of literature: emotional intelligence theory, theory of mind, affective computing, and AI ethics. These strands are not treated as parallel summaries. Each one contributes a different analytical layer to the central problem: what emotionally adaptive AI can do, what it cannot honestly claim to be, and what follows from that gap for governance.

Emotional intelligence theory

Salovey and Mayer (1990) define emotional intelligence as the capacity to perceive, use, understand, and manage emotions. Goleman (1995) later extended the construct into

organisational and leadership contexts, where emotional intelligence is associated with self-awareness, self-regulation, motivation, empathy, and social skill.

In human beings, these capacities are not merely classificatory. They are connected to subjective feeling, bodily feedback, memory, moral development, and social accountability. LLMs are different kinds of systems. They can produce text that resembles emotional insight, but they do not have a body, affective states, or a life history through which emotions gain meaning (Crawford, 2021). This does not make their outputs useless. It does mean that the phrase artificial emotional intelligence should be handled carefully. A safer formulation, and the one used throughout this paper, is functional emotional competence: the ability to produce outputs that are appropriate to emotionally charged situations, without assuming inner experience. This distinction matters for governance because it shifts the evaluative question from what the system feels to what the system does, and to whom.

Theory of mind and apparent mentalising

Theory of mind refers to the ability to attribute beliefs, intentions, and mental states to others and use those attributions to predict behaviour (Premack and Woodruff, 1978). Kosinski (2024) reports that frontier LLMs can perform surprisingly well on classical false-belief tasks. Wang *et al.* (2023) similarly find that LLMs can reach or exceed average human performance on some emotional understanding tasks while diverging from human patterns on others. These findings are important, but they do not prove that LLMs possess human-like mentalising. They show that language models can often infer the answer expected in social-reasoning tasks, which is a different and more limited achievement.

For governance, the philosophical question is less urgent than the functional one. If a system behaves as if it understands a user's emotions, and if users respond as if it understands them, then organisations must govern the consequences of that appearance. Apparent mentalising can be socially powerful even when it is computationally shallow, and that social power is where the regulatory risk resides.

Affective computing and anthropomorphism

Affective computing, as articulated by Picard (1997), seeks to enable computers to recognise, interpret, and respond to human affect. The field now includes facial emotion recognition, sentiment analysis, speech emotion detection, multimodal affect modelling, and adaptive dialogue (Ballesteros et al., 2024). These methods can be useful in care, accessibility,

education, and customer support, but they also translate ambiguous emotional life into measurable categories, a compression that carries its own risks of distortion and misuse.

Anthropomorphism intensifies the governance challenge that affective computing creates. Salles, Evers and Farisco (2020) argue that anthropomorphic language shapes how AI systems are understood and can create conceptual and ethical confusion. Deshpande et al. (2023) show that human-like design cues can encourage users to attribute more understanding to AI systems than the systems warrant. Carter, Loft and Visser (2023) add a critical nuance: anthropomorphic cues support trust calibration only when they communicate meaningful contextual information, not when they merely make a system seem human. This distinction is central to the argument developed in this paper. The governance question is not whether emotional design should exist, but whether it helps users understand the system more accurately or leads them to misread it. The four strands of literature converge on this point, and it is from this convergence that the SRI framework is constructed.

The SRI Framework: Signal, Relation, Influence

The SRI framework organises emotionally adaptive AI into three operational levels. It is not a claim that systems naturally progress through these levels. Rather, it is a diagnostic tool for locating capability, risk, and governance obligation. A single product may operate at different levels in different features, and the framework is designed to make that variation visible rather than flatten it.

Signal: detecting affective cues

At the Signal level, a system identifies affective cues in text, voice, facial expression, gesture, or other behavioural data. Examples include sentiment analysis, facial emotion recognition, distress flagging, and tone classification. This is the most common level of emotionally adaptive AI because it can be added to existing workflows without requiring a sustained relationship with the user.

The value of Signal lies in early detection. A support system may flag frustration before a customer leaves; a learning platform may detect confusion; a clinical triage tool may identify language associated with distress. The risk is that emotional signals are treated as more stable and objective than they are. Emotions are culturally mediated, context-sensitive, and sometimes strategically hidden. A smile, silence, hesitation, or abrupt sentence can mean

different things depending on the user and setting. Signal systems should therefore be governed as measurement instruments, subject to validation, subgroup performance testing, documented error rates, and clear limits on use. The analogy to medical or financial measurement is deliberate: an unvalidated emotional measurement tool should be held to the same standard of scrutiny as an unvalidated diagnostic one.

Relation: adapting within interaction

At the Relation level, the system adapts tone, content, pacing, and conversational strategy within an interaction. A Relation-level customer service agent may soften its language when a user appears frustrated. A tutoring system may slow down when a learner seems confused. A health chatbot may acknowledge distress and offer support resources. The system does not merely detect emotion; it acts on that detection in real time.

Relation is where the empathy illusion becomes most acute. A well-timed acknowledgement, a first-person phrase, or a reassuring conversational rhythm can lead users to feel seen by a system that has no inner concern for them. Fairweather, Montemayor and Halpern (2021) argue that AI cannot replace human empathy in healthcare because empathy is not only a response pattern but also a relational and moral practice. Leins et al. (2023) make a similar point in mental-health chatbots, where transparency, escalation routes, and safe boundaries are essential. Governance at this level should therefore focus on disclosure, design restraint, and human handover. The goal is not to make systems cold but to prevent warmth from becoming deception.

Influence: modelling and shaping over time

At the Influence level, the system builds a longitudinal model of the user and uses that model to anticipate or shape future behaviour. Influence is still limited in current LLM systems, but partial forms already exist in companion applications, personalised recommender systems, and retention-oriented interfaces. The system remembers enough about the user to predict when they are likely to engage, withdraw, disclose, purchase, comply, or become emotionally dependent.

The dominant risk at Influence is asymmetric persuasion. A system with a long memory of a user's emotional patterns can identify which message, tone, timing, or offer is most likely to move that user, and it can do so without the user's awareness of how much is known or how it is being used. Cheong (2024) frames such systems as accountability challenges because

algorithmic decisions can affect wellbeing while remaining opaque to the user. Weber-Guskar (2021) argues that emotionalised AI creates relational responsibilities even when the system is not genuinely relational. At Influence, consent and disclosure are not sufficient. Users cannot meaningfully consent to every future inference made from a growing emotional profile. Governance must therefore include emotional-data minimisation, a non-manipulation duty, and independent review of optimisation targets.

Table 1: The SRI framework as a governance map

Each level carries a distinct risk profile and a corresponding set of governance obligations. The diagnostic question in the final row identifies the practical evaluative test the framework is designed to answer at each level.

Level	Capability	Example deployments	Dominant risk	Primary governance instrument	Diagnostic question
Signal	Detecting and classifying affective cues in text, voice, image, or behavioural data.	Sentiment analytics; distress flagging; emotion recognition; service-quality monitoring.	Biased misclassification; covert measurement; false certainty.	Context-specific validation; documented error rates; subgroup testing; data minimisation.	Is this measurement valid?
Relation	Adapting tone, register, content, and pacing during an interaction.	Customer-service agents; adaptive tutors; therapy-adjacent chatbots.	Empathy illusion; over-attribution of understanding; unsafe reliance.	Machine-status disclosure; design restraint; bounded affective language; human escalation.	Is this adaptation honest?
Influence	Building longitudinal emotional	Companion apps; personalised retention systems;	Asymmetric persuasion; dependency;	Non-manipulation duty;	Is this influence manipulative?

Level	Capability	Example deployments	Dominant risk	Primary governance instrument	Diagnostic question
	profiles and shaping future behaviour.	emotionally targeted recommendations.	exploitation of vulnerability.	affective auditing; optimisation-target transparency; strict retention limits.	

Table 1: The SRI framework. Levels of emotionally adaptive AI, dominant risks, and primary governance instruments

Discussion and Governance Implications

The SRI framework shows that emotionally adaptive AI should not be governed as a single category. The risks change as systems move from measurement to interaction to longitudinal steering, and that change matters practically: a generic transparency statement cannot solve a measurement bias problem, and a bias audit cannot by itself prevent dependency or manipulation. Governance must follow the capability, not the category.

The EU Artificial Intelligence Act provides an important regulatory anchor. It defines emotion recognition systems, raises concerns about their scientific reliability and generalisability, prohibits certain emotion-inference uses in workplace and educational settings, and requires disclosure for many emotion-recognition deployments (European Parliament and Council of the European Union, 2024). These provisions are significant, but they still leave organisations with difficult implementation questions about which systems are affected, what disclosure must contain, and how compliance is demonstrated.

The SRI framework helps translate that legal direction into operational choices by giving each regulatory concern a level, a risk, and an instrument.

Governance instrument one: validation before deployment

Signal-level systems should not be deployed merely because they produce plausible labels. They should be validated against the context in which they will operate. Affective inference in

a retail chatbot, a school, a workplace, and a mental-health intake process cannot be treated as the same task, and a model validated in one setting carries no automatic authority in another. Validation should include subgroup analysis, false-positive and false-negative rates, human review thresholds, and documentation of what the model is not able to infer. The governing principle is simple: if an organisation would not accept an unvalidated medical, educational, or financial measurement tool, it should not accept an unvalidated emotional measurement tool.

Governance instrument two: disclosure and design restraint

Relation-level systems require plain-language disclosure at the point of interaction. Users should know when a system is detecting emotional cues, adapting responses based on inferred state, or simulating empathic language. Disclosure alone, however, is insufficient if design choices contradict it. A chatbot that says it is not human while using constant first-person intimacy, therapeutic phrasing, and memory-based flattery still pushes the user toward misattribution. Design restraint means using warmth where it supports comprehension and service quality, but avoiding cues that imply care, friendship, therapeutic competence, or personal concern that the system cannot possess. Disclosure and design must be consistent; one cannot substitute for the other.

Governance instrument three: emotional-data minimisation

Emotional profiles are a particularly sensitive form of data because they describe not only what users did but how they may have felt or been influenced. Organisations should minimise collection, retention, and secondary use of inferred affect. A reasonable design default is short retention for raw affective signals, strict separation between service delivery and marketing use, and explicit justification for any longitudinal emotional profile. The principle at stake is straightforward: emotional data collected to support a user should not silently migrate into systems designed to persuade one.

Governance instrument four: a non-manipulation duty

Influence-level systems require a stronger obligation than disclosure or minimisation. A non-manipulation duty would prohibit operators from using inferred emotional vulnerability to push decisions that primarily benefit the organisation at the user's expense. It would apply especially in mental health, education, employment, finance, care for older adults, and services used by children. This instrument is necessary because the most serious harms at the Influence level do not arise from inaccurate emotion recognition. They arise when accurate or partially accurate

inferences are used to steer users at moments of vulnerability, in directions chosen by the system's optimisation target rather than the user's own interests.

Governance instrument five: independent affective auditing

Independent affective auditing should evaluate not only model accuracy but also interaction outcomes. Audits should test whether systems induce dependency, over-disclosure, inappropriate trust, emotional targeting, or differential treatment across user groups. They should examine the optimisation target directly, because a system optimised for engagement may learn to prolong emotional reliance even when the stated service goal is support. Auditors should include technical experts, psychologists, ethicists, and domain specialists. In sensitive settings, user representatives should also have a role. Without independent review of what systems are actually optimising for, the other four instruments remain vulnerable to circumvention.

Implications for Organisations and Researchers

For organisations, three implications follow from the framework. The first is to choose the lowest sufficient level. Many use cases that appear to require Relation can be served adequately by Signal plus human handover. A mental-health triage tool may need to detect distress and route the user to appropriate support; it does not necessarily need to simulate a therapeutic relationship, and simulating one may create more risk than it resolves. The second is to align metrics with user welfare rather than engagement. A user who returns daily to a companion application may be receiving genuine support, or may be developing dependency; engagement figures cannot distinguish between the two. The third is to treat affective design as part of risk management, not only as user experience. Decisions about tone, memory, and conversational warmth are governance decisions, and they should be made with the same scrutiny applied to data architecture or access controls.

For researchers, the framework points to four priorities. Emotional intelligence benchmarks should be revised to distinguish recognition, explanation, regulation, and ethically appropriate response, since current benchmarks conflate these and overstate functional competence. Longitudinal studies are needed to understand how users form trust, attachment, and dependency over time, as most existing evidence is cross-sectional. More work is required on culturally specific emotional interpretation, because affective signals do not travel cleanly across languages and social norms, and governance instruments designed in one cultural

context may not transfer reliably to another. Finally, governance research should move from abstract principles to testable audit protocols, producing criteria that regulators, ethics boards, and product reviewers can apply in practice.

Conclusion

Emotionally adaptive AI is becoming part of ordinary digital life. The key question is not whether LLMs truly feel. They do not. The practical question is what happens when systems that do not feel become capable enough at the language of feeling to influence how people disclose, trust, learn, buy, and seek help.

This paper has proposed the SRI framework as a way to make that question governable. Signal, Relation, and Influence name three different levels of capability, each with a distinct risk profile and a distinct governance response. Signal requires validation. Relation requires disclosure and design restraint. Influence requires data minimisation, a non-manipulation duty, and independent affective auditing. The framework shifts debate away from the unproductive binary of real versus fake empathy and toward a more precise and actionable question: what is the system doing, to whom, over what time horizon, and under whose accountability?

The value of emotionally adaptive AI will depend on whether organisations can use affective capability without exploiting emotional vulnerability. Used carefully, these systems can improve accessibility, triage, learning support, and service quality. Used carelessly, they can turn emotional life into an optimisation surface. Future research should refine the SRI framework through empirical studies in specific domains, particularly mental health, education, customer service, and care for older adults. The aim should not be to remove emotional responsiveness from AI, but to make it honest, limited, auditable, and aligned with human welfare.

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TEACHING FEMINISM IN A POST-FEMINIST ERA: CULTIVATING ACADEMIC GRADUATES AS AGENTS OF GENDER MAINSTREAMING AND ORGANIZATIONAL CHANGE

Dr. Michal Gross (Adv.)
The Max Stern Jezreel Valley Academic College
Department of Human Services
Department of Social Work
Department of Nursing Science

Prof. Dalit Yasour-Borochovitch
The Max Stern Jezreel Valley Academic College
Department of Social Work (Head)

Keywords: Gender mainstreaming, Organizational change, Agents of change, Feminist pedagogy, Gender training, Resistance, Post-feminism, Emotional labor, Masculinities.

Introduction

Organizations are central arenas in which gender inequality is reproduced and can be transformed. Feminist teaching promotes critical awareness, professional responsibility, and sensitivity to the power relations embedded within social systems and organizations, and it has contributed significantly to organizational reform and social activism (Abrams, 2021; Casas et al., 2024). By cultivating gender sensitivity, awareness and competence, gender education prepares graduates to advance equality from within the workplaces and institutions they will later join. However, in the current socio-political climate, characterized by democratic erosion, challenges to human rights, and resistance to gender-equality initiatives in organizations and society alike (Sosa, 2021), feminist teaching increasingly operates in contested environments shaped by a post-feminist sense that assumes equality has already been achieved (Gill, 2017; Kenney, 2021).

Purpose, Aim, and Objectives

Feminist courses are essential for developing critical thinking and implementational skills and for facilitating the interface between academia, the labor market, family life, and political involvement. This ongoing research examines classroom processes and student responses from the lecturers' perspective, identifies strategies that reduce student resistance, offers practical recommendations for effective feminist training, and draws lessons transferable to gender training, diversity work, and gender mainstreaming in organizations more broadly.

Theoretical Framework

Feminism views knowledge as power; feminist teaching is therefore not the neutral transmission of information but a political act that challenges patriarchal "truth regimes" and the hegemony of "objective knowledge" (Harding, 1991; Hooks, 1994), while amplifying silenced perspectives (standpoint theory; Hekman, 1997). It favors dialogical, consciousness-raising teaching over Freire's (1970) "banking model," and draws on Hooks's (1994) "engaged pedagogy," in which lived experience and emotion are legitimate forms of knowledge. Intersectional approaches further insist that gender be analyzed alongside race, class, and nationality (Crenshaw, 1991; Case, 2016). Such teaching also demands gendered, largely unrecognized emotional labor (Hochschild, 1983; Morley, 1998), intensified by the neoliberal, post-feminist context (Gill, 2017; McRobbie, 2009). Crucially, gender education cultivates graduates as agents of change, equipping them to promote equality and diversity and to support gender mainstreaming, an organizational-change strategy whose implementation routinely meets resistance (Lombardo & Mergaert, 2013).

Methodology

The participants are around twenty lecturers committed to teaching from a feminist perspective. They hold various ranks (e.g., senior lecturers and professors) and come from diverse disciplines, including social sciences, humanities, and applied professions such as social work, medicine, and law, spanning distinct professional and organizational fields. Using a phenomenological-descriptive approach, the study employed open-ended, in-depth interviews that encouraged participants to describe, in their own words, their teaching experience and feelings in the classroom, the difficulties they face, including student resistance, institutional tensions, and pedagogical dilemmas, and their coping strategies and sources of support.

Main Findings, Novelty, and Contribution

Preliminary findings identify feminist courses as sites of social struggle and feminist lecturers as "academic warriors" against conservative forces seeking to reverse hard-won feminist achievements. This struggle unfolds on several levels: curricular (insisting on gender mainstreaming), institutional (defending courses, departments, and budgets), personal (sustaining a feminist identity under pressure to restrain controversy), and pedagogical (coping with strong student opposition that mirrors the wider social backlash). Lecturers describe learning as a "shattering experience" in which students cling to a protective "blindness" and react with denial, anger, and hostility. The study reframes this resistance as an indicator of success rather than something to fear; it is a signal of deep engagement and of the disruption of students' worldviews that can give rise to change-oriented agency. This contribution speaks directly to organizations: the resistance lecturers navigate parallels the resistance that gender-mainstreaming initiatives meet in workplaces, and these courses produce the future agents who will carry equality into their organizations.

Research Limitations

These are preliminary insights from ongoing work and interviews. The research is limited to a local context with specific socio-political characteristics, which makes broader generalization difficult. Future research could include a larger, cross-national sample, students' perspectives, and the longitudinal tracking of graduates' efforts to advance gender equality and mainstreaming within their own workplaces and organizations.

Practical Implications

In practice, the findings offer ways to cultivate critical feminist consciousness without provoking defensive closure: gradualism in introducing difficult content; emotional inclusion and delivering sharp messages gently; heavy reliance on robust data; embedding gender teaching at the systemic level so its influence "trickles" outward; and incorporating the study of masculinities to broaden participation while guarding against co-optation. A lecturer's explicit refusal to "convert" students, paired with clearly owned positions, further lowers resistance. Because they address the same defensive dynamics, these strategies transfer to gender training, diversity work, and mainstreaming initiatives in organizations. Above all, the research recasts gender education as a praxis that equips students to become sensitive, equality-oriented agents capable of advancing gender mainstreaming and organizational change.

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GLOBAL MINDS, LOCAL HANDS: HOW DOES CULTURAL CONTEXT SHAPE EMPLOYEE EXPERIENCES OF DEI IN MULTINATIONAL CORPORATIONS (MNCS)?

Georgiadou, Andri[1]; Jentjens, Sabine[2]

[1]University of Nottingham, Nottingham, United Kingdom

[2]ISC Paris, Paris, France

Keywords: Inclusion, Exclusion, Optimal Distinctiveness, Cultural Context, Multinational Corporations, DEI, Belongingness, Uniqueness

Introduction

Multinational corporations face a persistent tension when rolling out diversity, equity and inclusion (DEI) initiatives across global operations. Recent work shows they learn continuously, sharing, transferring and adapting practices to local realities (Jentjens, Georgiadou and Hennekam, 2026), yet how employees experience inclusion and exclusion once these locally adapted policies reach them remains unexplored.

Purpose, Aim and Objectives

This study examines the psychological mechanisms through which employees interpret DEI initiatives across cultural settings. Drawing on optimal distinctiveness theory, which holds that inclusion requires satisfying both a need to belong and a need to be valued as unique (Brewer, 2012; Shore et al., 2011), we ask how employees experience inclusion and exclusion across organisational levels when global policies meet diverse cultures, what mechanisms link cultural readings of belonging and uniqueness to those experiences, and how these experiences unfold over time.

Literature Review and Theoretical Framework

Optimal distinctiveness theory has been developed largely in Western, individualist settings, yet cultural dimensions such as individualism-collectivism and power distance reshape what belonging and uniqueness feel like, and so what makes an initiative inclusive. We adopt a multi-level lens in which inclusion signals reach employees from the organisation, leaders, work group and their own identity, and culture shapes which level carries most weight. Recent work theorises inclusion as a multilevel, relational phenomenon beyond demographic

representation (Georgiadou et al., 2024) and shows cultural values conditioning how inclusion translates into belonging and well-being (Georgiadou et al., 2025). Extant empirical studies further substantiate this positioning: cross-cultural research on inclusion experiences documents substantial variation in how employees from collectivist versus individualist societies perceive organisational belonging cues (Mor Barak et al., 2016), while quantitative work on DEI programme outcomes confirms that locally calibrated initiatives yield stronger well-being effects than standardised global ones (Nishii and Leroy, 2022) and that cross-border institutional differences impact perceived priorities (Leone et al., 2025). Integrating these findings anchors the present study within a growing body of evidence and reinforces the contemporary relevance of a culturally sensitive, multilevel approach to inclusion.

Methodology and Methods

We conducted a qualitative, multi-case study combining expert interviews with sixteen DEI professionals across five French MNCs. Participants held global, regional and local responsibilities spanning diverse cultural contexts. Semi-structured interviews of 45 to 60 minutes, conducted in English, French or German, were analysed using Braun and Clarke's (2006) thematic analysis, with both authors coding independently before converging through iterative discussion, negative-case analysis and peer debriefing. It is acknowledged that intermediate conclusions are based on DEI professionals' recollections and expert knowledge rather than on first-hand employee accounts. This design choice reflects the exploratory, process-oriented aims of the study and is addressed as a limitation below. However, interviewed experts worked in close contact with various stakeholder such as Employee Resource Groups (ERG) that allowed them to collect direct employee feedback that helped nourish their work. The aim of our overarching research project is to triangulate, in a second step, DEI professionals' perceptions with primary data on employee perceptions.

Findings and Contribution

We identify four psychological mechanisms, each operating differently across cultures and organisational levels. (1) Culturally contingent belonging: what signals belonging varies, from interpersonal respect to formal recognition, with international mobility creating identities that transcend local definitions. (2) The uniqueness–othering paradox: recognising difference can affirm uniqueness or instead mark people as different, as when language accommodation left employees feeling singled out. (3) Cross-level signal conflict: cues from the organisation, leader, work group and self can pull in different directions, with cultural values, including

power distance, determining which level dominates. (4) Temporal-institutional legitimation: legal and institutional frameworks shape how safely employees express identity over time, and inclusion is consequently experienced as an evolving rather than a static condition. We therefore propose a culturally contingent model in which cultural context does not merely moderate the belonging-uniqueness-inclusion relationship but reconfigures it.

Originality and Value

Complementing the organisational-learning account of how DEI travels across borders (Jentjens et al., 2026), the study shows that even well-functioning learning leaves the psychological reception of practices filtered through cultural meaning systems. Standardised global programmes therefore cannot produce uniform psychological outcomes; MNCs need culturally adaptive frameworks attentive to local meanings of belonging and uniqueness.

Research Limitations

The findings draw on DEI professionals' process knowledge rather than employees' direct accounts, which may filter employee experience; future research should collect employee data directly. The sample under-represents Asian and African contexts, and the retrospective design limits claims about real-time processes. As a qualitative study, it offers transferability rather than statistical generalisation.

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THE ITALIAN CAPITAL OF CULTURE APPLICATION DOSSIER AS A TOOL FOR TERRITORIAL ENHANCEMENT: THE CASE OF VALEGGIO SUL MINCIO

Davide Gaeta[1], Daniela Cavallo[2]

1. Associate Professor, Department of Management, University of Verona
[2] Architect, Adjunct Professor of Territorial Marketing, Territory Coach, Project Leader

Keywords

Italian Capital of Culture; territorial enhancement; cultural governance; bottom-up participation; strategic assets; territorial analysis; territorial networks; local development; cultural planning

Abstract

This paper examines the preparation of the application dossier for the Italian Capital of Culture as a tool for territorial enhancement and the activation of long-term cultural development processes. Through the case study of Valeggio sul Mincio, the contribution highlights how an integrated territorial analysis, grounded in quantitative and qualitative data, fosters collective awareness that translates into consciousness, responsibility, and action. Central to this process is the identification of strategic assets as interpretative devices for managing territorial complexity, along with bottom-up participation in the construction of a shared vision. The paper also underscores the potential of the dossier to function as a model of cultural governance grounded in collaboration among institutions, partners, and stakeholders, and in the creation of stable territorial networks, regardless of the final outcome of the application.

Introduction

The application for the title of Italian Capital of Culture represents an opportunity of extraordinary relevance for territories, not only in terms of visibility but, above all, as a structured process of analysis, planning, and community activation. The value of the dossier lies not exclusively in the outcome, but in the path leading to its construction: a process that enables territories to be interpreted in their complexity, activates new forms of participation, and experiments with shared models of cultural governance. The systemic crises characterizing the current global scenario—environmental, geopolitical, and economic—require governance systems and enterprises to undertake profound strategic rethinking. In this context, the enhancement of territorial and cultural resources becomes a

crucial lever for organizational excellence, particularly in rural areas with strong productive and identity-based vocations, such as wine and food appellations of origin (Alston, Gaeta 2021; Gaeta, Perali 2025). The Italian Capital of Culture call thus emerges not merely as an instrument of cultural promotion, but as a platform for territorial innovation capable of activating networks among institutions, businesses, and local communities. The work carried out for the Valeggio sul Mincio dossier fully aligns with this perspective, configuring itself as a laboratory for strategic reflection and vision-building, in which culture becomes a driver of integrated territorial development.

Territorial Analysis as a Foundational Act

The first qualifying element of the Valeggio sul Mincio process was an in-depth study of the territory, conceived not as a simple descriptive survey but as a genuine critical investigation. The collection of quantitative data (demographic indicators, tourism flows, economic data, infrastructure, services) was complemented by qualitative analysis based on listening to local actors, mapping cultural practices, and interpreting historical, landscape, and productive identities.

This work revealed a plurality of dimensions: Valeggio village as a place of historical and architectural heritage; a riverine and agricultural landscape; a tourism hub and a living community shaped by complex social and economic dynamics. The knowledge thus constructed fostered a process of collective awareness, transforming data and information into shared consciousness.

Managing Complexity through Strategic Assets, Bottom-Up Participation, and Vision Building

One of the most significant aspects of dossier work was the identification of strategic assets as a key to interpreting and governing territorial complexity. In a context such as Valeggio sul Mincio, characterized by the coexistence of environmental, cultural, tourism, and productive values, there is a risk of fragmentation in policy and projects. The identification of assets, rather than their focus, enabled synthesis and strategic orientation. Strategic assets were not conceived as individual attractions, but as integrated systems of value capable of linking heritage, community, economies, and future visions. In this way, the dossier constructed a coherent narrative that connected past, present, and development perspectives, offering a compass for strategic decision-making.

The Valeggio sul Mincio application process assigned a central role to bottom-up participation, recognizing that no cultural strategy can be effective if it is not shared. Through moments of dialogue, working tables, and the involvement of associations, cultural operators, businesses, and citizens, the dossier became a space for dialogue and co-design. This process strengthened the territory's social capital, facilitating the transition from a sum of individual interests to a collective vision. Participation

also enabled the identification of latent needs, informal energies, and widespread skills that often remain invisible in traditional decision-making processes. Within the dossier, the SWOT analysis played a central role in transforming knowledge into strategy: As Strengths: the landscape identity linked to the Mincio River, historical heritage, tourism recognition, and local expertise. As Weaknesses: fragmentation among actors, tourism seasonality, and difficulties in coordinating cultural, environmental, and economic policies. As Opportunities: the application as a catalyst for resources, innovation in cultural consumption models, and the possibility of experimenting with new forms of governance. Finally, as Threats, we find the risk of a simplified territorial narrative, unmanaged tourism pressure, and loss of continuity after the application process. This analysis enabled the construction of a dossier that was both realistic and ambitious, grounded in a critical engagement with territorial fragilities.

The research has some limitations. The analysis focuses on a single case study. The qualitative nature of the study limits the statistical generalizability of the results. Some effects of the candidacy can only be assessed over the long term. Finally, the direct involvement of local stakeholders may influence the perception of the results. However, these limitations do not compromise the paper's interpretative value, which remains strong in terms of exploratory and methodological relevance.

Conclusions

The Valeggio sul Mincio case demonstrates that preparing the application dossier for the Italian Capital of Culture can be a powerful tool for territorial enhancement, regardless of the final outcome. Through territorial analysis, the identification of strategic assets, bottom-up participation, and network building, the dossier becomes a process of cultural transformation capable of generating awareness, responsibility, and action. From this perspective, culture emerges not only as content but as a method for governing complexity and fostering sustainable territorial development. A true instrument of awareness, responsibility, and collective care of the community towards its territory and its future. One of the most relevant outcomes of the work carried out for Valeggio sul Mincio is the potential to transform the application method into a model of cultural governance. The dossier functioned as a platform for strategic sharing, based on the involvement of partners and stakeholders and on the construction of a stable territorial network. In this sense, the application becomes a permanent coordination device capable of guiding public policies, private initiatives, and civil society actions.

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THE SUSTAINABILITY AND MODERNIZATION GAP IN TOURISM PERFORMANCE MANAGEMENT: A BIBLIOMETRIC PERSPECTIVE (1979-2025)

Aggelopoulos, Eleftherios[1] Kalogera, Maria[1] Paraschi, Elen Paraskevi[2] Lampropoulos, Ioannis[1]

[1] Department of Business Administration, University of Patras, Greece

[2] Department of Tourism Management, University of Patras, Greece

Keywords: Performance Management Systems, Management Accounting, Tourism and Hospitality Industry, Bibliometric Analysis, Management Control Systems, VOSviewer, Sustainability, Strategic Management Accounting

Abstract

Introduction

The tourism and hospitality sector operates under intense competition and environmental uncertainty, complicating managerial decision-making (Darvishmotevali et al., 2020; Pappas, 2018). Under these conditions, effective performance management systems support organizational sustainability, while management accounting and control systems enable planning, evaluation, and benchmarking, particularly in low-margin, highly differentiated enterprises (Fatima & Elbanna, 2020; Harris & Brander Brown, 1998).

Purpose, aim and objectives

The purpose of this study is to systematically map international research on performance management systems in tourism and hospitality from a management accounting perspective. Specifically, the study aims to identify the dominant thematic clusters, examine their temporal evolution, analyse international scientific collaboration, and reveal research gaps related to sustainability and digital transformation.

Literature review and research gap

Existing studies emphasize performance measurement, management control, budgeting, benchmarking, and tools such as the Balanced Scorecard in tourism and hospitality organizations (Fatima & Elbanna, 2020). However, the literature remains fragmented, lacks an integrated conceptual framework (Sainaghi et al., 2017; Sainaghi et al., 2019), and has frequently relied on econometric productivity models (e.g., DEA and SFA) without incorporating management accounting perspectives (Assaf & Tsionas, 2019). Although sustainability and strategic management accounting are increasingly discussed, they remain peripheral to the core structure of tourism performance management research, a gap not addressed by previous bibliometric reviews and examined through this bibliometric mapping.

Methodology and methods

A structured Scopus search using predefined keywords and predefined search criteria up to December 2025 identified 116 peer-reviewed articles, analyzed with VOSviewer, following keyword cleaning procedures, to examine keyword co-occurrence, thematic clusters, temporal trends, and international co-authorship patterns (van Eck & Waltman, 2010; 2014).

Main findings and contribution

The analysis identified four thematic clusters, with a dominant focus on management control and budgeting in hotel enterprises (Harris & Brander Brown, 1998; Fatima & Elbanna, 2020), while strategic and sustainability-oriented themes remain weakly consolidated, and international scientific collaboration is limited.

Originality, limitations and implications

Unlike previous reviews focusing on performance measurement or productivity modelling, this study provides a management accounting-oriented bibliometric synthesis of tourism performance management research. The findings reveal a persistent modernization gap, defined as the limited integration of sustainability, ESG-oriented accounting, digital transformation, and artificial intelligence within the field's core intellectual structure. The findings provide a research agenda for integrating these emerging themes into future tourism performance management research.

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GEOPOLITICAL INSTABILITY IN ISRAEL AND ITS IMPACT ON HOTEL SECTOR PERFORMANCE IN NEIGHBOURING COUNTRIES: EVIDENCE FROM CYPRUS AND GREECE USING MONTHLY TOURISM DATA

Markou, Chrystalla[1]; Christodoulides, Costas[2]

[1]School of Business and Hospitality Studies, Alexander College, Larnaca, Cyprus

[2]Faculty of Business, Alexander College, Larnaca, Cyprus

Abstract

This study examines the impact of geopolitical instability in Israel specifically the 2023 to 2024 Israel Hamas conflict on hotel sector performance in neighbouring tourism dependent economies, namely Cyprus and Greece. The research investigates whether severe disruptions to Israel's inbound tourism generate measurable spillover or substitution effects across proximate destinations.

The study adopts a high-frequency, data-driven approach and pursues three main objectives: (i) to analyse long-term tourism dynamics across Israel, Cyprus, and Greece; (ii) to compare tourism performance across pre-conflict, conflict, and post-conflict periods; and (iii) to assess the extent to which fluctuations in Israel's inbound tourism can predict changes in hotel nights in Cyprus and Greece. The central research question explores whether geopolitical shocks in one destination translate into demand shifts in neighbouring markets. Theoretically, the study contributes to the literature on political instability and tourism by engaging with debates on spillover versus substitution effects, while addressing a key gap related to the limited use of high-frequency (monthly) tourism data in existing research. Methodologically, the study employs a quantitative longitudinal design using monthly secondary data. Analytical techniques include descriptive statistics, mean comparison tests, correlation analysis, and regression modelling to capture dynamic relationships across the three countries.The findings indicate a significant contraction in Israel's inbound tourism during the conflict period, accompanied by observable impacts on hotel sector performance in Cyprus and Greece. The results suggest that geopolitical instability generates complex regional effects, highlighting both vulnerability and interdependence among neighbouring destinations. The study further underscores the strategic importance of regional cooperation frameworks such as the Cyprus, Greece, and Israel trilateral partnership in enhancing resilience through coordinated marketing and adaptive tourism strategies.

Keywords

Geopolitical risk; Israel–Hamas conflict; tourism spillover effects; hotel sector performance; Cyprus; Greece; Eastern Mediterranean; regional tourism interdependence; crisis impacts; time-ordered tourism data.

1. Introduction

Tourism in the Eastern Mediterranean operates within a complex environment shaped by geopolitical tensions, regional conflicts and shifting traveller perceptions of safety. Israel, Cyprus and Greece constitute an interconnected tourism zone in which disruptions in one destination can generate ripple effects across neighbouring economies. The outbreak of the Israel and Hamas conflict in October 2023 resulted in a dramatic collapse in inbound tourism to Israel, raising concerns about broader regional impacts (Hazbun, 2024). Although media and policy reports describe substantial cancellations and weakened demand across the Middle East during the conflict, systematic empirical evidence on how these shocks affect nearby non-conflict destinations remains limited. The trilateral partnership between Cyprus, Greece, and Israel is considered to have played a pivotal role in shaping the region's tourism dynamics and resilience to shocks. As argued by Koukakis (2023) and Tziarras (2023), the partnership has facilitated coordinated approaches to tourism development, crisis response, and the promotion of the Eastern Mediterranean as a unified destination. This institutional collaboration is relevant to the topic under discussion as it is thought that the partnership can be particularly significant during periods of instability, enabling Cyprus and Greece to absorb and manage spillover effects from Israeli tourism disruptions more effectively. Existing research acknowledges that tourism is highly sensitive to geopolitical instability, yet most academic studies focus on individual destinations rather than examining regional spillover patterns (Hazbun, 2024; Gelbman, 2008; Dogan, Ghosh, Tiwari, & Abakah, 2023). Furthermore, tourism impacts of crises are frequently assessed using annual data, which conceal short-term fluctuations that are critical in sudden, high intensity geopolitical events (Duan, Xie, & Morrison, 2022). Hotel sector performance measured through nights spent in hotels is rarely used as the primary indicator despite its direct relevance to revenue management and operational decision making in hospitality. This study addresses these gaps by analysing monthly data from 2015 to 2024 to assess whether geopolitical shocks in Israel generate measurable effects on hotel nights in Cyprus and Greece. Using descriptive statistics, mean comparisons across pre-war, war and post-war periods, t-tests, correlations and multivariate regression models adjusting for time and seasonality, the study provides a comprehensive examination of geopolitical spillover in the Eastern Mediterranean hotel sector.

2. Literature Review

Tourism is widely recognised as one of the economic sectors most vulnerable to political instability, conflict and crisis events (Cheer, Lapointe, Mostafanezhad, & Jamal, 2021; Grigoriadis, Salepaki, Angelou, & Kourkouridis, 2025; Jaisinghani, Kaur, Joshi, Sharma, &

Ahmed, 2024). A substantial body of research demonstrates that perceived or actual insecurity leads to rapid declines in visitor arrivals, travel cancellations and reduced hotel occupancy (Talukder, Hoque, & Miah, 2025; Kumar, 2024; Mohammad, 2014). Studies of conflict affected destinations across regions including the Middle East and Eastern Europe show that even localised violence can have national level tourism repercussions, often extending into long term reputational harm (Butler, 2018; Morakabati, 2013). These patterns are supported by Risk Perception Theory, which argues that tourists respond primarily to *perceived* rather than objective risk, often generalising security concerns across whole regions (Seabra, Dolnicar, Abrantes, & Kastenholz, 2013; Cui, Liu, Chang, Duan, & Li, 2016). Such perceptions intensify during conflicts in places like Israel, where media attention amplifies perceived regional instability, leading travellers to avoid not only the conflict site but neighbouring destinations as well. The trilateral partnership literature further supports the notion of regional interdependence and risk transmission. As Koukakis (2023) and Lindenstrauss & Gavrielides (2019) have suggested, the cooperation between Cyprus, Greece, and Israel has established mechanisms for managing shared risks, including those affecting the tourism sector. These include joint crisis communication, coordinated marketing efforts, and the development of alternative tourism flows in response to disruptions. Tziarras (2020, 2023) highlights that such collaboration not only strengthens the resilience of each country's tourism industry but also creates opportunities for demand substitution and joint recovery initiatives during periods of instability. In the Eastern Mediterranean, several contributions highlight the region's high dependence on international tourism and its susceptibility to geopolitical disruptions (Tkachuk, 2019; Akamavi, Ibrahim, & Swaray, 2023). Research indicates that travellers often evaluate safety at the regional rather than national scale, consequently, conflict in one country may create risk spillovers for neighbouring destinations such as Cyprus and Greece (Theocharous, Zopiatis, Lambertides, Savva, & Mansfeld, 2020). Crisis Spillover Theory provides the conceptual basis for this process, suggesting that destabilising events in one destination can produce indirect consequences in other interconnected destinations through shared air routes, overlapping source markets, or regional media framing (Duan, Xie, & Morrison, 2022; Seyfi, Afsari, & Hosseini, 2026). This means that even when Cyprus or Greece remain physically safe, travellers may reduce or cancel trips due to perceived proximity to conflict. Despite this recognition, empirical studies examining cross-border spillover effects remain limited. Much of the literature either focuses on individual destinations or relies on annual data, which masks short-run volatility and immediate crisis reactions (Duan, Xie, & Morrison, 2022; Kazakova & Kim, 2021). The trilateral partnership is thus highly relevant to the present study, as it provides a structural explanation for the observed tourism interdependencies and spillover

effects. The partnership's emphasis on cooperative economic and tourism strategies, as documented by Koukakis (2023) and Tziarras (2023), aligns with the empirical findings of this study. This institutional context helps explain why spillover effects are not only present but are also shaped by the degree of cooperation and integration among the three countries

Another research gap concerns the choice of performance indicators. Most studies rely on tourist arrivals rather than accommodation-based metrics, even though hotel nights directly reflect demand for lodging, occupancy revenue and operational pressures faced by hotel management (Ortega, 2016; Lima Santos, Gomes, Malheiros, Crespo, & Bento, 2024; Cetin, Demirciftci, & Bilgihan, 2016). This gap can be further explained by Tourism Demand Substitution Theory, which proposes that travellers may shift demand from high-risk destinations toward perceived safer substitutes (Cakar, Morrison, & Gowreesunkar, 2025; Fuchs & Reichel, 2011). In principle, destinations like Cyprus or Greece could absorb diverted demand when Israel faces instability; however, substitution depends on travellers'confidence in regional safety. Severe conflicts can suppress not only demand for the affected country but for the wider region, weakening potential substitution benefits. This underscores the need to examine actual hotel sector outcomes, not only arrival numbers.

Furthermore, at the macro level, Geopolitical Risk Theory supports that conflict, instability and uncertainty generate measurable economic shocks that extend across borders (Balli, Balli, Hasan, & Gregory-Allen, 2022; Caldara & Iacoviello, 2022). Destinations embedded in a shared regional system are therefore affected not only by direct crisis exposure but also by region' wide increases in geopolitical risk (Ehteshami, 2007). This theoretical perspective aligns with research showing that geopolitical tensions reduce travel confidence, reshape mobility patterns and weaken tourism flows even in non-conflict jurisdictions (Grudtsyn, 2024; Kazakova & Kim, 2021). Applying this lens to the Eastern Mediterranean suggests that geopolitical shocks in Israel may operate as regional risk signals that influence hotel performance in neighbouring tourism economies. This study addresses the above gaps by examining whether Israeli tourism disruptions during the 2023-2024 conflict predict changes in hotel nights in Cyprus and Greece. By using monthly data across a long period and focusing on hotel-specific indicators, the research advances understanding of regional tourism interdependencies and provides practical insight into how geopolitical instability affects hotel performance in proximate non-conflict destinations. The integration of Risk Perception Theory, Crisis Spillover Theory, Tourism Demand Substitution Theory, and Geopolitical Risk Theory provides a coherent conceptual foundation for interpreting these spillover dynamics and for understanding why geopolitical crises originating in one destination can have significant economic impacts across the wider region.

3. Methodology

This research adopts a quantitative, longitudinal design to examine the effects of Israel's geopolitical instability on hotel sector performance in Cyprus and Greece. The study draws on monthly secondary data collected between January 2015 and December 2024. To evaluate whether the Israel–Hamas conflict was associated with changes in hotel performance, the monthly dataset was divided into three distinct periods based on the timing of the geopolitical event. The pre-war period comprised all monthly observations from January 2015 to September 2023, representing tourism activity before the outbreak of the conflict. The war period covered the months from October 2023 to March 2024, corresponding to the initial phase of the Israel–Hamas conflict when tourism demand was expected to experience its greatest disruption. The post-war period included observations from April 2024 to May 2025, capturing the period following the initial conflict phase and enabling an assessment of whether hotel demand showed signs of recovery or continued to be affected by the geopolitical shock. These three periods formed the basis for the mean comparison analysis and independent-samples t-tests conducted to identify statistically significant differences in hotel nights before, during and after the conflict. Tourism arrivals to Israel were sourced from the Israel Central Bureau of Statistics (Central Bureau of Statistics Israel, 2026) while hotel nights in Cyprus and Greece were obtained from Eurostat
(European Commission Eurostat, 2026). These datasets were harmonised to ensure temporal alignment. Differences in sample size across models result from one missing monthly observation in Eurostat. SPSS uses listwise deletion, resulting in N=113 in regression analyses. A quantitative, longitudinal design is a research approach that uses numerical data collected repeatedly over a defined period to analyse changes, trends and causal relationships across time. Unlike cross-sectional designs that capture information at a single point, longitudinal studies observe the same units such as countries, firms or populations across multiple time intervals (Rindfleisch, Malter, Ganesan, & Moorman, 2008). This allows researchers to examine how variables evolve, how external shocks influence outcomes and whether patterns remain consistent or shift over time (Cohen, Manion, & Morrison, 2017). Because the focus is on systematically tracking temporal dynamics, the design is appropriate for studying tourism demand, geopolitical disruptions and other phenomena where timing and sequence play a critical role. In the context of this study, the quantitative, longitudinal design enables a detailed assessment of how monthly tourism indicators in Israel, Cyprus and Greece changed over the 2015-2024 period and how these patterns were affected by the 2023-2024 conflict. By analysing repeated monthly observations, the study identifies both short-term shocks during the war

period and longer-term tourism trends, offering a more precise and sensitive evaluation than those based on annual data or single time-point comparisons.

The dependent variables are monthly hotel nights in Cyprus and Greee, representing hotel sector performance. The primary independent variable is monthly inbound tourism to Israel. To isolate the impact of the 2023-2024 conflict, a binary war dummy variable was constructed (1 = war months October 2023-March 2024; 0 = non-war months). Two control variables were included: a linear time trend to account for underlying long-term growth in tourism and a month variable to reflect seasonality. Data preparation included converting date variables into SPSS-recognised formats, creating trend and seasonal indicators, and screening for missing values. Natural log transformations were computed for robustness checks, although unlogged values were used for the primary analysis due to their managerial interpretability. The analysis proceeded through descriptive statistics, mean comparisons, t-tests, correlation analysis, and regression modelling. Descriptive statistics, mean comparisons, t-tests, correlation analysis and regression modelling are commonly used in quantitative, longitudinal research because together they provide a systematic, layered approach to examining how variables change over time and how those changes relate to external events or conditions (Almusaed, Almssad, & Yitmen, 2025). Descriptive statistics establish baseline patterns and reveal overall trends, enabling researchers to understand the magnitude, variability and distribution of key measures before conducting more complex analyses (Cooksey, 2020). Descriptive statistics were required for this study in order to provide a clear overview of the data, establish baseline levels of tourism activity, and identify major fluctuations across the pre-war, war, and post-war periods, otherwise this would not be possible to interpret subsequent inferential results or understand the scale of disruption. Mean comparisons and t-tests allow researchers to evaluate whether changes across specific time periods such as before, during or after a major event are statistically meaningful rather than random fluctuations (Niiler, 2020). Mean comparisons across the three periods allowed the study to detect directional changes associated with the geopolitical shock, offering initial evidence of whether the hotel sectors of Cyprus and Greece experienced measurable shifts during Israel's conflict period. Independent-samples t-tests were critical for statistically evaluating whether the differences observed between war and non-war months were significant rather than random fluctuations. These tests provide a formal assessment of whether the war period constituted a genuine structural change in regional tourism patterns. Correlation analysis is essential for identifying the degree to which variables move together over time, providing insight into potential interdependencies or spillover relationships across

units being studied (Rigobon, 2019). Correlation analysis further clarified the strength and direction of relationships between Israeli inbound tourism and hotel demand in Cyprus and Greece. This step was necessary to identify whether co-movement existed across destinations and to establish preliminary evidence of spillover effects prior to multivariate modelling. Regression modelling builds on these earlier steps by isolating the effect of one variable while controlling for temporal patterns, seasonality or other confounding factors that often appear in longitudinal data (Jebb & Tay, 2017). Regression modelling was essential for isolating the effect of Israel's geopolitical instability while controlling for underlying time trends and seasonal patterns. Simple regressions assessed the direct association between Israeli arrivals and hotel nights, while multiple regressions enabled a more robust examination by separating geopolitical effects from temporal dynamics. This progression from descriptive to inferential to multivariate analysis ensures that the study's conclusions are empirically grounded, statistically validated, and capable of distinguishing direct crisis impacts from background tourism trends. Together, these methods allow longitudinal studies to combine sensitivity to time-based changes with rigorous statistical testing, establishing both descriptive clarity and causal insight in environments where trends, shocks and time- dependent patterns interact (Sliwinski & Mogle, 2008; Zhao, Shipp, Carter, Gonzalez-Mulé, & Xu, 2024). Simple linear regressions examined the direct effect of Israel's tourism fluctuations on Cyprus and Greece. Multiple regression models adjusted for time trends, seasonality and the geopolitical dummy to assess whether Israeli tourism remained a significant predictor of regional hotel performance after controlling for temporal dynamics. This approach uses time-ordered data. Ethical considerations were addressed throughout the research process. The study relies solely on publicly available, aggregate-level secondary data from official statistical agencies, with no involvement of human participants, personal data, or confidential sources. As such, the analysis poses no ethical risk and does not require institutional ethics approval. All data were used in accordance with open-access usage guidelines from Eurostat and the Israel Central Bureau of Statistics. The research complies with general academic integrity standards, ensuring transparency, replicability, and responsible use of publicly available information (Kishan & Gupta, 2024; Tripathy, 2013).

Regression Diagnostics

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.339[a]	.115	.090	9655133.222	.410

a. Predictors: (Constant), trend, WAR_DUMMY_ISRAEL, Israel_arrivals_actual

b. Dependent Variable: Greece

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	396967.086	3263727.096		.122	.903		
	Israel_arrivals_actual	20.534	7.997	.282	2.568	.012	.673	1.485
	WAR_DUMMY_ISRAEL	-8046837.973	4216057.662	-.179	-1.909	.059	.923	1.083
	trend	106948.897	34031.139	.346	3.143	.002	.669	1.494

a. Dependent Variable: Greece

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Israel_arrivals_actual	WAR_DUMMY_ISRAEL	trend
1	1	2.593	1.000	.01	.02	.02	.02
	2	.979	1.627	.00	.03	.76	.00
	3	.380	2.611	.00	.25	.22	.20
	4	.048	7.342	.99	.70	.00	.78

a. Dependent Variable: Greece

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.420[a]	.176	.153	834134.477	.356

a. Predictors: (Constant), trend, WAR_DUMMY_ISRAEL, Israel_arrivals_actual

b. Dependent Variable: Cyprus

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	68691.447	281962.686		.244	.808		
	Israel_arrivals_actual	2.943	.691	.451	4.259	.000	.673	1.485
	WAR_DUMMY_ISRAEL	-527355.073	364237.238	-.131	-1.448	.151	.923	1.083
	trend	10577.345	2940.047	.382	3.598	.000	.669	1.494

a. Dependent Variable: Cyprus

Collinearity Diagnostics[a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions			
				(Constant)	Israel_arrivals_actual	WAR_DUMMY_ISRAEL	trend
1	1	2.593	1.000	.01	.02	.02	.02
	2	.979	1.627	.00	.03	.76	.00
	3	.380	2.611	.00	.25	.22	.20
	4	.048	7.342	.99	.70	.00	.78

a. Dependent Variable: Cyprus

Potential multicollinearity among the explanatory variables was examined using tolerance and Variance Inflation Factor (VIF) statistics. The tolerance values ranged from 0.669 to 0.923, while the corresponding VIF values ranged from 1.083 to 1.494 across both regression models. These values are well within the commonly accepted thresholds (Tolerance > 0.20; VIF < 5.0), indicating that multicollinearity was not present and that the explanatory variables contributed independently to the estimated models.

The independence of residuals was assessed using the Durbin Watson statistic. The values obtained were 0.410 for the Greece model and 0.356 for the Cyprus model, indicating the presence of positive autocorrelation in the residuals. This outcome is not unexpected given the longitudinal nature of the dataset, which consists of consecutive monthly observations over a ten-year period. Time-series tourism data frequently exhibit serial dependence because tourism demand tends to persist across successive months (Chen, Li, Wu, & Shen, 2019).

Consequently, the Durbin Watson results should be interpreted as a characteristic of the temporal structure of the data rather than evidence of model misspecification.

Potential endogeneity represents a common challenge in observational tourism research, particularly when using secondary longitudinal data. Changes in hotel demand may be influenced by omitted factors such as global tourism recovery, macroeconomic conditions, airline capacity, exchange rate fluctuations, fuel prices and destination-specific marketing activities. To reduce the likelihood of omitted-variable bias, the regression models incorporated a linear time trend to capture long-term tourism growth and a war dummy variable representing the geopolitical shock associated with the 2023–2024 Israel–Hamas conflict. These controls were intended to account for temporal changes and isolate the association between Israeli inbound tourism and hotel performance in Cyprus and Greece. Nevertheless, as with most observational studies, endogeneity cannot be completely eliminated and the estimated relationships should therefore be interpreted as statistically robust associations rather than definitive causal effects.

4.Results

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Israel_arrivals_actual	114	600	485500	203393.77	138609.843
Greece	113	66553	33942944	10257017.08	10123284.473
Cyprus	113	1103	2953148	1244194.09	906568.822
Valid N (listwise)	113				

Table 1 Descriptive Statistics

The descriptive statistics provide an initial overview of tourism activity in the Eastern Mediterranean over the period 2015 to 2025 and highlight the markedly different volatility patterns between Israel, Greece, and Cyprus. Israel records an average of 203,394 monthly tourist arrivals, with values ranging from as low as 600 to as high as 485,500 arrivals. This exceptionally wide range, coupled with a large standard deviation of 138,610, reflects the country's acute vulnerability to geopolitical disruptions, which can trigger abrupt collapses in inbound tourism. In contrast, tourism activity in Greece is substantially larger in scale, averaging 10.26 million nights per month, with figures ranging from 66,553 to 33.94 million nights. The very high standard deviation (10.12 million) is expected for a destination characterised by strong seasonality, but it also suggests that Greece's hotel sector experiences pronounced fluctuations that may be partially amplified during regional crises. Cyprus displays

a similar but more moderate pattern, with monthly hotel nights averaging 1.24 million and ranging between 1,103 and 2.95 million, accompanied by a standard deviation of 906,569. Overall, these figures indicate that while Israel shows extreme volatility driven largely by geopolitical shocks, Greece and Cyprus also exhibit substantial fluctuations in accommodation demand, suggesting that regional instability including conflict events centred in Israel may exert broader spillover effects across neighbouring tourism-dependent economies.

Compare Means

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Israel_arrivals_actual * period	114	100.0%	0	0.0%	114	100.0%
Greece * period	113	99.1%	1	0.9%	114	100.0%
Cyprus * period	113	99.1%	1	0.9%	114	100.0%

Report

period		Israel_arrivals_actual	Greece	Cyprus
post	Mean	107418.18	15157943.50	1733987.40
	N	11	10	10
	Std. Deviation	29795.228	12218079.052	987485.960
pre	Mean	231248.24	9390316.85	1157632.71
	N	91	91	91
	Std. Deviation	141594.283	9541886.728	876775.389
war	Mean	80141.67	12745388.50	1492456.75
	N	12	12	12
	Std. Deviation	17913.502	11898017.754	966077.106
Total	Mean	203393.77	10257017.08	1244194.09
	N	114	113	113
	Std. Deviation	138609.843	10123284.473	906568.822

Mean Comparisons (Pre, War, Post)

The mean comparison results reveal substantial shifts in tourism patterns during the 2023 to 2024 Israel and Hamas conflict. Prior to the war (pre-period), Israel received on average 231,248 tourists per month, while Greece and Cyprus recorded mean monthly hotel nights of 9.39 million and 1.16 million, respectively. During the war period (October 2023– March 2024), Israel's inbound tourism collapsed to an average of only 80,141 tourists per month, representing

a decline of approximately 65% relative to pre-war levels. This dramatic contraction reflects the immediate sensitivity of Israel's tourism sector to geopolitical instability.

Greece and Cyprus also experienced notable reductions during the war period, although to a lesser extent. Average monthly hotel nights in Greece dropped from 9.39 million to 3.45 million, a fall of around 63%, while Cyprus saw a reduction from 1.16 million to 1.49 million (approximately –29%), capturing the wider regional spillover of the geopolitical shock. These results indicate that although the conflict was territorially concentrated in Israel, nearby Mediterranean destinations were indirectly affected through intensified risk perception and travel uncertainty. In the post-war period, all three destinations show signs of recovery. Israel rebounded to an average of 107,418 tourists per month, while Greece and Cyprus
experienced sharp rebounds to 15.16 million and 1.73 million hotel nights respectively. The particularly strong post-war performance of Greece and Cyprus suggests a compensatory or delayed tourism surge, potentially driven by pent-up travel demand, diversion from riskier zones, and renewed market confidence. Overall, the pattern supports the conclusion that major geopolitical shocks in Israel trigger immediate and severe declines in inbound tourism to Israel, accompanied by observable though more moderate spillover effects in neighbouring tourism-dependent economies such as Cyprus and Greece.

Independent Samples t-test
T-Test

Group Statistics

	WAR_DUMMY_ISRAEL	N	Mean	Std. Deviation	Std. Error Mean
Israel_arrivals_actual	0	108	211123.98	138304.608	13308.367
	1	6	64250.00	18442.424	7529.088
Greece	0	107	10638423.14	10244621.913	990384.982
	1	6	3455275.67	3457471.973	1411507.022
Cyprus	0	107	1274809.47	912853.522	88248.881
	1	6	698219.83	605032.901	247003.647

Group 1 = WAR_DUMMY_ISRAEL = 0
(pre-war + post-war months)
Group 2 = WAR_DUMMY_ISRAEL = 1
(war period: Oct 2023– Mar 2024)

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Israel Arrivals actual	Equal variances assumed	14.865	.000	2.589	112	.011	146873.981	56723.733	34483.176	259264.787
	Equal variances not assumed			9.606	58.409	.000	146873.981	15290.513	116271.256	177476.707
Greece	Equal variances assumed	10.365	.002	1.706	111	.091	7183147.474	4211362.465	-1161948.389	15528243.337
	Equal variances not assumed			4.166	11.009	.002	7183147.474	1724301.159	3388370.525	10977924.422
Cyprus	Equal variances assumed	10.055	.002	1.525	111	.130	576589.634	378109.740	-172660.058	1325839.326
	Equal variances not assumed			2.198	6.353	.068	576589.634	262295.000	-56675.547	1209854.815

The independent-samples t-tests reveal statistically meaningful (significant as well or only meaningful) differences between war and non-war periods in regional tourism activity. Israel experienced the strongest effects: average monthly tourist arrivals declined from 211,124 during non-war months to 64,250 during the war period, a reduction of approximately 69%, which is statistically significant ($t = 2.589$, $p = 0.011$). Greece also shows a significant reduction in hotel nights during the conflict, falling from 10.64 million to 3.46 million nights on average ($t = 4.166$, $p = 0.002$, unequal variances assumed). This confirms that the Israel–Hamas war generated regional spillover impacts,

depressing tourism demand beyond Israel itself. Cyprus exhibits a similar negative pattern, with hotel nights decreasing from 1.27 million to 0.70 million, although this difference is only marginally significant (t = 2.198, p = 0.068). Overall, the results support the conclusion that geopolitical instability centred in Israel significantly disrupts tourism flows across the Eastern Mediterranean, with particularly pronounced consequences for Israel but also substantial effects for neighbouring Greece and Cyprus.

Correlations

Correlations

		Israel_arrivals_actual	Greece	Cyprus
Israel_arrivals_actual	Pearson Correlation	1	.130	.268**
	Sig. (2-tailed)		.169	.004
	N	114	113	113
Greece	Pearson Correlation	.130	1	.923**
	Sig. (2-tailed)	.169		.000
	N	113	113	113
Cyprus	Pearson Correlation	.268**	.923**	1
	Sig. (2-tailed)	.004	.000	
	N	113	113	113

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis provides *valuable insight into the co-movement of tourism activity* across the Eastern Mediterranean. Israel's inbound tourism shows no significant correlation with hotel nights in Greece (r = .130, p = .169), indicating that fluctuations in Israel do not typically align with those in Greece during *non-crisis periods*.. However, Israel exhibits a weak but statistically significant positive correlation with Cyprus (r = .268, p = .004), suggesting that both destinations *are partially influenced by common regional demand drivers* and may respond similarly to broader geopolitical conditions.The strongest relationship emerges between Greece and Cyprus, which display an exceptionally high positive correlation (r = .923, p <.001), reflecting their *highly synchronised seasonality patterns*, shared tourism markets, and similar exposure to regional travel dynamics. Collectively, these results show that while Israel's tourism behaves more independently and is is *particularly sensitive to geopolitical shocks*, Greece and Cyprus move together as part of a *highly integrated regional tourism system*. This supports the broader interpretation that geopolitical instability centered in Israel produces not only direct disruptions within Israel but also *significant spillover effects* across its neighbouring

Mediterranean destinations.

Regression

Greece $= \beta_0 + \beta_1$(Israel_arrivals_actual)

Cyprus $= \beta_0 + \beta_1$(Israel_arrivals_actual)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.130[a]	.017	.008	10082277.405

a. Predictors: (Constant), Israel_arrivals_actual

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1944522537691 16.000	1	1944522537691 16.000	1.913	.169[b]
	Residual	1128340726097 2410.000	111	1016523176664 18.120		
	Total	1147785951474 1520.000	112			

a. Dependent Variable: Greece

b. Predictors: (Constant), Israel_arrivals_actual

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8322386.553	1690020.857		4.924	.000
	Israel_arrivals_actual	9.478	6.853	.130	1.383	.169

a. Dependent Variable: Greece

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.268[a]	.072	.063	877437.067

a. Predictors: (Constant), Israel_arrivals_actual

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.

1	Regression	6590672679840.703	1	6590672679840.703	8.560	.004[b]
	Residual	8545843457116.420	111	769895806947.463		
	Total	9204910725100.120	112			

a. Dependent Variable: Cyprus

b. Predictors: (Constant), Israel_arrivals_actual

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	888024.842	147078.570		6.038	.000
	Israel_arrivals_actual	1.745	.596	.268	2.926	.004

a. Dependent Variable: Cyprus

The regression analyses highlight important differences in how Israel's tourism trends influence nearby Eastern Mediterranean destinations. For Greece, the effect of Israel's inbound arrivals is weak and statistically insignificant (B = 9.478, p = .169), with the model explaining only 1.7% of variance (R^2 = .017), indicating that Israeli tourism fluctuations do not meaningfully predict hotel demand in Greece. In contrast, Israel's arrivals have a significant positive effect on hotel activity in Cyprus (B = 1.745, p = .004), with the model accounting for 7.2% of variance (R^2 = .072). This demonstrates that Cyprus is more sensitive to Israel's tourism patterns, likely due to greater geographical proximity and shared regional travel dynamics. Overall, the results suggest that while Israel's geopolitical shocks do not directly transmit to Greece through regular tourism flows, they have a measurable and statistically significant effect on Cyprus.

Multiple regression (with controls) causal impact

Greece $= \beta_0 + \beta_1$(Israel_arrivals_actual) $+ \beta_2$(WAR_DUMMY_ISRAEL) $+ \beta_3$(trend) $+\beta_4$(month_num)

Cyprus $= \beta_0 + \beta_1$(Israel_arrivals_actual) $+ \beta_2$(WAR_DUMMY_ISRAEL) $+ \beta_3$(trend) $+\beta_4$(month_num)

Model Summary A

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.339[a]	.115	.090	9655133.222

a. Predictors: (Constant), trend, WAR_DUMMY_ISRAEL, Israel_arrivals_actual

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1316705382918848.000	3	438901794306282.600	4.708	.004[b]
	Residual	1016115413182680.000	109	9322159753965 7.610		
	Total	1147785951474 1520.000	112			

a. Dependent Variable: Greece

b. Predictors: (Constant), trend, WAR_DUMMY_ISRAEL, Israel_arrivals_actual

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	396967.086	3263727.096		.122	.903
	Israel_arrivals_actual	20.534	7.997	.282	2.568	.012
	WAR_DUMMY_ISRAEL	-8046837.973	4216057.662	-.179	-1.909	.059
	trend	106948.897	34031.139	.346	3.143	.002

a. Dependent Variable: Greece

The multiple regression model examining the determinants of hotel nights in Greece is statistically significant ($F(3,109) = 4.708$, $p = .004$), explaining 11.5% of the variance ($R^2 =$ .115). When controlling for seasonality (month_num) and long-term trends (trend), Israel's inbound tourism emerges as a significant positive predictor of hotel nights in Greece ($B = 20.534$, $p = .012$). This indicates that increases in Israeli tourist arrivals are associated with higher accommodation demand in Greece, even after adjusting for time effects. The war dummy variable is negative and marginally significant ($B = –8046837.973$, $p = .059$), suggesting that the 2023–2024 conflict exerted a downward pressure on Greek hotel

performance, although the effect is weaker once controls are included. The trend variable is positive and statistically significant (B = 1,069,488.897, p = .002), confirming a long-term upward pattern in Greek tourism independent of geopolitical disturbances. The conflict in Israel affects Greece modestly but detectably. Israeli tourism flows contribute positively to Greek hotel demand, while the war period depresses activity somewhat although long-term upward trends mitigate this effect. This indicates that Greece experiences regional spillover, but the relationship is less direct than in Cyprus.

Model Summary B

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.420[a]	.176	.153	834134.477

a. Predictors: (Constant), trend, WAR_DUMMY_ISRAEL, Israel_arrivals_actual

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1620905166927 6.875	3	5403017223092 .292	7.765	.000[b]
	Residual	7584005558173 2.250	109	695780326437. 911		
	Total	9204910725100 9.120	112			

a. Dependent Variable: Cyprus

b. Predictors: (Constant), trend, WAR_DUMMY_ISRAEL, Israel_arrivals_actual

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	68691.447	281962.686		.244	.808
	Israel_arrivals_actual	2.943	.691	.451	4.259	.000
	WAR_DUMMY_ISRAEL	-527355.073	364237.238	-.131	-1.448	.151
	trend	10577.345	2940.047	.382	3.598	.000

a. Dependent Variable: Cyprus

The model for Cyprus shows a stronger fit, explaining 17.6% of the variance (R^2 = .176) and is highly significant (F(3,109) = 7.765, p < .001). Israel's inbound tourism exerts a strong, statistically significant positive effect on Cyprus hotel nights (B = 2.943, p < .001). The war dummy variable is negative but not statistically significant (B = –5,273,555.073, p = .151), indicating that once controls are added, the war itself does not independently predict Cyprus hotel activity as strongly as the general collapse in Israel's tourism does. The trend variable is again significant and positive (B = 10,577.345, p < .001), suggesting long-term growth in the Cypriot hotel sector. Cyprus shows a clear and robust linkage with Israeli tourism trends. When Israel experiences a tourism decline, Cyprus hotel demand also decreases consistent with close geographical ties, overlapping source markets, and shared regional risk exposure. The significant coefficient for Israel arrivals confirms a direct measurable spillover effect of Israel's geopolitical instability on Cyprus.

The multiple regression models provide strong evidence that Israel's geopolitical instability reshapes tourism patterns across the Eastern Mediterranean. Israel's inbound arrivals significantly predict hotel demand in both Greece and Cyprus, but the effect is substantially stronger in Cyprus. The war dummy variable negatively affects both destinations, though it is marginal in Greece and not independently significant for Cyprus once controls are considered. Importantly, long-term trends remain positive for both countries, indicating that while geopolitical crises create short-term disruptions, underlying tourism growth trajectories persist. Overall, the results confirm that Israel's geopolitical shocks generate measurable regional spillover effects, with Cyprus being the most directly affected and Greece experiencing secondary but still detectable influences.

Cross-correlation

Cross Correlations

Series Pair: Israel_arrivals_actual with Greece

Lag	Cross Correlation	Std. Error[a]
-12	-.081	.100
-11	-.045	.099
-10	.031	.099
-9	.104	.098
-8	.135	.098
-7	.123	.097
-6	.105	.097
-5	.094	.096
-4	.092	.096
-3	.114	.095
-2	.122	.095
-1	.115	.094
0	.130	.094
1	.133	.094
2	.143	.095
3	.112	.095
4	.019	.096
5	-.095	.096
6	-.175	.097
7	-.196	.097
8	-.159	.098
9	-.107	.098
10	-.073	.099
11	-.075	.099
12	-.090	.100

a. Based on the assumption that the series are not cross correlated and that one of the series is white noise.

Cross Correlations

Series Pair: Israel_arrivals_actual with Greece

Lag	Cross Correlation	Std. Error[a]
-12	-.081	.100
-11	-.045	.099

-10	.031	.099
-9	.104	.098
-8	.135	.098
-7	.123	.097
-6	.105	.097
-5	.094	.096
-4	.092	.096
-3	.114	.095
-2	.122	.095
-1	.115	.094
0	.130	.094
1	.133	.094
2	.143	.095
3	.112	.095
4	.019	.096
5	-.095	.096
6	-.175	.097
7	-.196	.097
8	-.159	.098
9	-.107	.098
10	-.073	.099
11	-.075	.099
12	-.090	.100

a. Based on the assumption that the series are not cross correlated and that one of the series is white noise.

Israel tourist arrivals towards Greece hotel nights

The highest cross-correlation occurs at Lag = +2 (r = 0.143), although the correlation is relatively weak. The contemporaneous relationship (Lag = 0) is r = 0.130, which is identical to the Pearson correlation reported earlier. This suggests that changes in Israeli tourist arrivals are only weakly associated with hotel nights in Greece, with a possible delay of approximately two months. However, the magnitude of the correlation remains low throughout the lag structure, indicating that Greece's hotel market is relatively

resilient to fluctuations in Israeli tourism demand. This finding is consistent with the regression analysis, which showed that Israeli arrivals did not significantly predict hotel nights in Greece in the simple regression model ($p = .169$), although the relationship became significant after controlling for the war period and long-term trend.

Israel tourist arrivals towards Cyprus hotel nights

The strongest relationship is observed at Lag = 0 ($r = 0.268$), representing the highest cross-correlation across all examined lags. The correlations at Lag = +1 ($r = 0.245$) and Lag = −1 ($r = 0.228$) are also relatively strong, indicating that the relationship is concentrated around the same period rather than occurring after a prolonged delay. These findings suggest that changes in Israeli tourism are reflected almost immediately in Cyprus's hotel market, supporting the hypothesis that Cyprus is more directly exposed to geopolitical spillover effects because of its geographical proximity and stronger tourism linkages with Israel. This result also reinforces the regression findings, where Israeli tourist arrivals remained a statistically significant predictor of hotel nights in Cyprus in both the simple regression ($\beta = .268$, $p = .004$) and the multiple regression model ($\beta = .451$, $p < .001$).

5. Discussion of Findings

The findings of the present study reveal *systematic and differentiated effects* of the 2023–2024 Israel–Hamas conflict on tourism and hotel performance across the Eastern Mediterranean, reinforcing the *structural sensitivity* of tourism systems to geopolitical instability. Israel experienced the most pronounced shock, with inbound tourism collapsing during the conflict period, reflecting *well-documented crisis-response patterns in tourism demand*. This outcome provides strong empirical support for Risk Perception Theory, which posits that tourist behaviour is highly elastic to perceived risk, particularly in high-visibility conflict environments where global media amplification intensifies uncertainty (Seabra et al., 2013; Cui et al., 2016). *Importantly, the findings suggest that perceived risk operates as a leading indicator of demand contraction, often preceding the full dissemination of objective information* (Grigoriadis et al., 2025).

The observed contraction in hotel nights in Cyprus and Greece demonstrates that the consequences of the conflict extend beyond the immediate conflict zone. Both the mean

comparisons and t-test results indicate statistically significant declines—*more pronounced in Greece and moderately transmitted to Cyprus*—during the conflict period. These findings are consistent with Crisis Spillover Theory, which conceptualises crises as *regionally transmitted shocks mediated through perception, connectivity, and information flows* (Duan et al., 2022; Seyfi et al., 2026). The results further align with the broader literature suggesting that tourists assess risk at a *regional rather than national level*, particularly in geopolitically sensitive contexts such as the Eastern Mediterranean.

However, the differential magnitude of decline between Cyprus and Greece suggests that spillover effects are *heterogeneous and structurally conditioned*. This finding extends Crisis Spillover Theory by demonstrating that *spillover intensity is not solely a function of geographic proximity, but of destination-specific absorptive capacity, market diversification, and structural resilience* (Kazakova & Kim, 2021). In this respect, the study contributes to the literature by introducing a *differentiated spillover framework* that accounts for variation in impact across neighbouring destinations.

The regression results provide further insight into the transmission mechanisms underlying these dynamics. The strong association between Israeli inbound tourism and hotel nights in Cyprus indicates a *high degree of bilateral tourism interdependence*, suggesting that Cyprus functions as a *proximate demand-linked system* to Israel. This is partially consistent with Tourism Demand Substitution Theory; however, the findings reveal important boundary conditions. While substitution may occur under conditions of moderate instability, *the present results demonstrate that under high-intensity geopolitical shocks, substitution effects are attenuated or reversed*, leading instead to *regional demand contraction*. This nuance advances the theoretical literature by identifying *threshold effects in substitution behaviour*, where perceived regional risk surpasses a critical level.

In contrast, Greece exhibits a weaker dependence on Israeli tourism flows, reflecting a *more diversified and structurally resilient tourism economy*. This supports existing research indicating that *destination size, market diversification, and global demand integration act as buffers against geographically concentrated shocks* (Papagianni et al., 2024; Lee et al., 2021). The persistence of Israeli tourism as a statistically significant

predictor in the multivariate models, even after controlling for trend and seasonality, reinforces the interpretation that *geopolitical instability operates as a systemic regional risk signal*.

From a macro-perspective, these findings align with Geopolitical Risk Theory, which posits that heightened geopolitical tensions generate *broad-based economic and mobility disruptions that extend beyond national borders* (Caldara & Iacoviello, 2022). The statistically significant war dummy variable confirms the presence of a *structural break*, indicating that the conflict exerted an independent and negative effect on hotel performance, beyond cyclical or seasonal influences.

At the same time, the positive trend coefficients for Cyprus and Greece confirm the presence of *underlying structural growth trajectories in Mediterranean tourism*, suggesting that while geopolitical shocks induce sharp short-term contractions, the system retains *adaptive capacity and recovery potential*. This dual dynamic *short-term vulnerability coupled with long-term resilience* is central to understanding tourism system behaviour under crisis conditions.

Overall, the findings demonstrate that geopolitical shocks in Israel *propagate through interconnected regional tourism systems rather than remaining spatially contained*. Cyprus, as a closely linked destination, exhibits higher sensitivity, whereas Greece demonstrates moderated but still significant exposure. By employing *high-frequency, destination-level data*, the study addresses a critical gap in the literature, which has predominantly relied on aggregated or annual data.

The integration of Risk Perception Theory, Crisis Spillover Theory, Tourism Demand Substitution Theory, and Geopolitical Risk Theory provides a *multi-layered theoretical framework* for interpreting these findings. *Rather than operating in isolation, these theoretical lenses interact to explain the non-linear, threshold-based, and spatially differentiated mechanisms through which geopolitical instability reshapes regional tourism demand.*

6. Conclusion

Using high-frequency monthly data and a longitudinal analytical framework, the research demonstrates that the 2023–2024 Israel–Hamas conflict generated

substantial and statistically significant disruptions in tourism demand, both within Israel and across neighbouring destinations.

The findings extend beyond descriptive analysis by revealing *systemic interdependencies and asymmetric spillover effects* between Israel, Cyprus, and Greece. The results confirm that geopolitical shocks are transmitted through *regional perception mechanisms and structural tourism linkages*, rather than being confined to the origin of the conflict.

Importantly, the study advances theoretical understanding by demonstrating that *tourism demand substitution is conditional and non-linear*, occurring only under limited levels of perceived risk, while severe geopolitical crises produce *region-wide demand suppression*. Furthermore, the persistence of positive trend effects highlights the *long-term resilience of Mediterranean tourism systems*, despite exposure to recurrent external shocks.

By combining multiple theoretical perspectives with high-frequency empirical analysis, the study provides a *comprehensive and integrative explanation of regional tourism dynamics under geopolitical stress*. It thus contributes to both the *theoretical advancement* and the *empirical refinement* of tourism crisis literature.

7. Research Recommendations

Building on the current study's findings, several avenues for future research emerge. First, although this analysis used monthly secondary data, future studies could incorporate *higher-frequency and real-time datasets* such as weekly flight occupancy, search engine trends, or booking platform data to more precisely capture traveller responsiveness during conflict escalation phases. Incorporating airline route changes, seat capacity data, and regional connectivity metrics could further illuminate how *supply-side adjustments and network disruptions* mediate spillover effects.

Second, future research should explore traveller sentiment and behavioural intention data, including social media analytics, news sentiment modelling, or survey-based measures of perceived risk. Such work would strengthen the

empirical operationalisation of Risk Perception Theory and provide a more direct linkage between perceived risk and observed behavioural outcomes.

Third, extending the geographic scope of analysis to include Turkey, Egypt, Lebanon, and Jordan would provide a broader understanding of *multi-country regional interdependencies*. Comparative analysis could reveal whether spillover intensity differs across *institutional contexts, geopolitical alignments, or cultural proximity*.

Fourth, applying advanced time-series econometric techniques such as structural break models and *interrupted time-series analysis* could deepen causal inference and clarify temporal lag effects. This would enable researchers to determine whether spillover impacts emerge immediately, gradually, or persist beyond conflict periods, thereby identifying *dynamic adjustment mechanisms in tourism demand*.

Finally, qualitative or mixed-methods studies involving hotel managers, tourism boards, and airlines could complement quantitative findings by uncovering *adaptive strategies, managerial decision-making processes, and crisis-response mechanisms* that are not directly observable in numerical datasets. This would enhance the *managerial and policy relevance* of future research.

8. Managerial (Corporate) Recommendations

The findings of this study offer several practical insights for hotel managers and tourism authorities in Cyprus and Greece. First, the significant regression relationships between Israel's inbound tourism and hotel nights—*particularly in the case of Cyprus*—suggest that geopolitical developments should be systematically integrated into forecasting models, pricing strategies, and capacity planning. Hotels should incorporate *geopolitical risk monitoring* into revenue management systems, using early warning indicators to anticipate demand fluctuations.

Second, given the demonstrated spillover effects, tourism stakeholders should prioritise *source market diversification strategies* to reduce

vulnerability to geographically concentrated shocks. Greece already benefits from a diversified demand structure, while Cyprus could enhance resilience by expanding its presence in Northern and Western European markets and strengthening long-haul segments.

Third, enhancing crisis communication strategies is critical. Clear and consistent messaging regarding safety, accessibility, and operational continuity can mitigate *regional risk generalisation effects*. Tourism authorities should coordinate with international stakeholders to ensure that *conflict narratives do not disproportionately affect destination image*.

Fourth, hotels and tourism authorities should invest in *operational flexibility and adaptive capacity*, including dynamic pricing, flexible staffing models, and targeted short-term promotional campaigns to stabilise demand during periods of uncertainty.

Fifth, collaboration across the tourism value chain—*including hotels, airlines, tour operators, and destination management organisations*—should be strengthened. Joint marketing initiatives, coordinated crisis-response mechanisms, and shared risk-management strategies can accelerate recovery and reduce volatility.

Beyond these general strategies, the empirical findings suggest more targeted actions. For hotel managers, the significant relationship between Israeli arrivals and Cyprus hotel demand ($\beta = .451$, $p < .001$) indicates that geopolitical indicators should be incorporated into *real-time occupancy forecasting and revenue optimisation models*. For national tourism organisations, reducing dependence on regionally concentrated markets is essential. Cyprus, which exhibits the strongest spillover sensitivity, should pursue *strategic market rebalancing*, while Greece should continue leveraging its diversified portfolio.

Destination management organisations should establish *integrated and rapid-response communication frameworks* capable of addressing shifts in

international risk perception. Because the findings demonstrate that risk perceptions extend beyond the conflict zone, coordinated communication among ministries, airports, airlines, and industry stakeholders is essential.

Finally, policymakers should incorporate *systematic geopolitical risk assessment* into national tourism resilience strategies. Continuous monitoring of geopolitical risk indices, airline capacity, booking behaviour, and regional tourism flows would enable earlier intervention and more effective strategic planning.

Proposed Conceptual Model: Geopolitical Spillover Framework

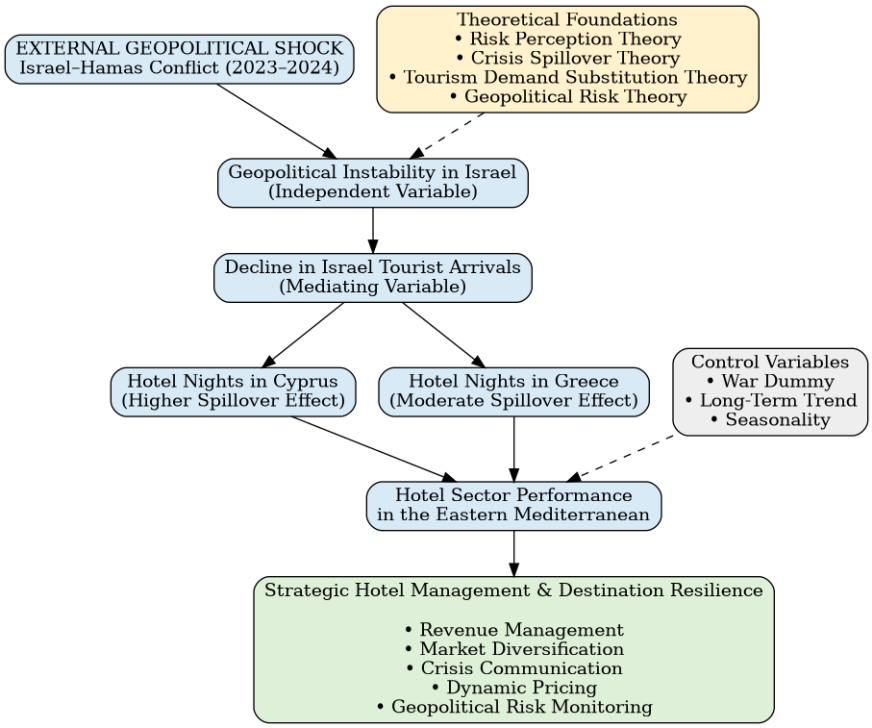


Figure 1. Proposed Conceptual Framework of Geopolitical Spillover Effects on Hotel Performance in the Eastern Mediterranean (Developed by the Authors).
The figure presents the conceptual framework developed from the empirical findings of this study.

The proposed conceptual framework *integrates empirical findings with theoretical*

perspectives to model the transmission of geopolitical shocks across interconnected tourism systems. It conceptualises the Israel–Hamas conflict as an *exogenous geopolitical shock* that reduces inbound tourism in Israel and generates *differentiated spillover effects* in Cyprus and Greece.

The framework incorporates key moderating variables, including *seasonality, long-term trends, and structural characteristics of destinations*, which influence the magnitude of impact. It is grounded in Risk Perception Theory, Crisis Spillover Theory, Tourism Demand Substitution Theory, and Geopolitical Risk Theory, which collectively explain the behavioural and systemic mechanisms underlying tourism demand shifts.

Importantly, the framework extends existing theory by introducing a *multi-layered and non-linear interpretation of spillover dynamics*, highlighting that spillover intensity depends on *destination resilience, interdependence, and perceived regional risk thresholds*. It also identifies managerial implications related to *risk monitoring, diversification, and adaptive strategy development*, thereby linking theory with practice.

9. Limitations

The independence of residuals was evaluated using the Durbin–Watson statistic, with values of 0.410 (Greece) and 0.356 (Cyprus), indicating the presence of positive autocorrelation. This is *consistent with the temporal structure of longitudinal tourism data*, where demand exhibits persistence across time periods. While this does not necessarily indicate model misspecification, it highlights the limitations of ordinary least squares estimation in time-series contexts.

A further limitation concerns potential endogeneity arising from omitted variables not captured in the dataset. Factors such as macroeconomic conditions, airline connectivity, exchange rates, and destination marketing may also influence hotel demand. Although trend and conflict-period controls partially address this issue, future studies should incorporate *broader explanatory variables or advanced econometric techniques* to

improve causal inference.

The relatively modest explanatory power of the models further suggests that tourism demand is influenced by *a complex set of interacting determinants*. Accordingly, the results should be interpreted as evidence of *significant but partial spillover effects*, rather than a singular causal mechanism.

Future research could employ *Vector Autoregression (VAR), Granger causality, or panel data models* to capture dynamic interdependencies and reciprocal relationships between variables. Expanding the model to include additional macroeconomic and tourism-specific indicators would further strengthen robustness.

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LUXURY HOSPITALITY IN SOUTHERN FRANCE: NAVIGATING THE SUSTAINABLE TRANSITION

Travasi, Alessio[1]; Musso, Fabio[1]; Mayrhofer, Ulrike[2]

[1]Department of Economics, Society, Politics, University of Urbino Carlo Bo, Urbino, Italy

[2]IAE Nice, Université Côte d'Azur, Nice, France

Keywords: Luxury Hospitality, Sustainable Hospitality Management, Multiple Case Study, French Riviera.

Introduction

In the realm of luxury hospitality, sustainability has evolved from a niche preference to a critical indicator of quality and prestige. Historically associated with excess and abundance, the luxury sector is now under intense scrutiny to reconcile exclusivity with environmental responsibility; high-end travellers increasingly demand ethical transparency without compromising comfort, forcing luxury hotels to innovate. Given that luxury properties typically have a higher carbon footprint per guest compared to standard accommodation, the shift towards sustainable operations is imperative for maintaining social license and brand equity.

Purpose, Aim and Objectives

This study aims to investigate how the luxury hotel sector on the French Riviera is integrating sustainability into its value proposition. The research is driven by three key objectives: *i)* to explore how luxury hotel managers perceive the trade-off between opulence and eco-efficiency; *ii)* to identify specific barriers hindering sustainable practices in high-end environments; and *iii)* to determine whether sustainability initiatives act as a genuine competitive differentiator in the luxury market. A central focus is placed on comparing the strategies of independent luxury boutique hotels versus those belonging to international luxury chains.

Literature Review and Theoretical Framework

The study draws upon the triple bottom line sustainability framework – environmental, social, and economic – adapted for the luxury context. Literature highlights a tension in luxury hospitality: while guests expect premium services, they also seek meaningful, responsible

experiences. In terms of economic and environmental sustainability, technological advancements – including AI, IoT, and renewable energy systems – are cited as key enablers for both reducing waste and costs without diminishing the guest experience; social sustainability (e.g., fair labour, community engagement etc.) is equally critical for the human-centric service model of luxury hotels (Juvan et al., 2026).

Methodology and Methods

A qualitative multiple-case study design was employed to enable an in-depth analysis of the sector (Yin, 2009). Data were collected through semi-structured interviews with general managers of 14 luxury hotels located on the French Riviera. Using purposeful sampling (Suri, 2011), the study focused on five-star and palace hotels with established environmental commitments, including both properties managed by international luxury groups and independent family-owned establishments. Data were analysed following a grounded theory approach (Gioia et al., 2013), allowing the identification of distinct patterns in luxury management practices.

Main/Expected Findings and Contribution

The findings reveal that while sustainability is a priority across the board, the implementation strategies diverge significantly. Luxury hotels belonging to major groups leverage significant capital to deploy high-tech solutions, such as AI-driven energy management systems and advanced water recycling plants, effectively hiding sustainability behind technology to maintain seamless service. Conversely, independent luxury hotels, lacking comparable financial muscle, focus on artisanal sustainability. They emphasize exclusivity through deep ties with local culture, such as sourcing hyper-local organic food and eliminating single-use plastics in favour of bespoke, locally crafted amenities. The study finds that while groups use sustainability to meet corporate compliance, independent luxury hotels use it to narrate a story of authenticity and heritage.

Originality and Value

This research contributes to hospitality literature by dissecting the ownership luxury paradox of the French Riviera: global brands pursue eco-technological efficiency, while independent icons pursue eco-cultural authenticity. This distinction provides a novel framework for understanding how different ownership structures interpret luxury in the age of sustainability.

Research Limitations

The study is geographically confined to the French Riviera, a mature luxury destination, which may limit the applicability of the findings to emerging luxury markets. Nevertheless, the framework of eco-technological efficiency and eco-cultural authenticity may be conceptually transferable to other established high-end coastal destinations facing similar sustainability pressures. Furthermore, the focus on top-tier luxury properties may restrict the transferability of the findings to broader upscale and premium hospitality segments.

Theoretical and Practical Implications

Theoretically, the study challenges the notion that luxury and sustainability are incompatible, proposing a model where sustainability enhances rather than dilutes exclusivity. In the long term, these sustainability-driven positioning strategies are likely to dictate brand survivability and resilience, transforming corporate compliance into market-leading brand equity for chains, and cementing deep-rooted guest loyalty for independent hotels. Practically, the findings suggest that independent luxury hoteliers should double down on their unique asset – i.e. local identity – rather than trying to compete with chains on technological infrastructure. For policymakers, the results highlight a need to support independent luxury properties through incentives for heritage preservation and energy retrofitting, which are often more complex in historic independent buildings than in modern chain hotels.

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PERCEIVED SOCIAL PRESENCE AND TRUST IN AI-ENABLED HOSPITALITY SERVICES:

BEYOND TECHNOLOGY ACCEPTANCE MODELS

Wahbi, Marwan[1]; El Sahili, Hanine[2]

[1]Management, Marketing, and Entrepreneurship Track, Suliman Olayan School of Business, American University of Beirut, Beirut, Lebanon

[2]Management, Marketing, and Entrepreneurship Track, Suliman Olayan School of Business, American University of Beirut, Beirut, Lebanon

Abstract

Artificial intelligence (AI)-enabled services can improve the efficiency and personalisation of hotel experiences, yet their adoption remains challenging in a service context traditionally characterised by human interaction. Drawing on the technology acceptance models and social presence theory, this study examines how functional, cognitive, normative, trust-based, and socio-relational evaluations shape behavioural intention to use AI-enabled hotel services. A cross-sectional online survey generated 111 usable responses from Millennial and Generation Z consumers.

The proposed model was tested using partial least squares structural equation modelling (PLS-SEM) in SmartPLS 4. It explained 83.9% of the variance in behavioural intention. Perceived social presence was its only significant direct predictor ($\beta = .592$, $p < .001$). Perceived usefulness had the largest total effect ($\beta = .609$, $p < .001$), but its influence operated predominantly through social presence. Perceived trust strongly influenced perceived usefulness, while ease of use, subjective norm, and cognitive instrumental process contributed through sequential indirect pathways involving usefulness and social presence.

The study extends technology-acceptance research by positioning social presence as the proximal mechanism through which functional value translates into behavioural intention. Managerially, the findings indicate that hotels should combine demonstrable functional benefits and trustworthy performance with appropriately designed social responsiveness and accessible human support.

Keywords: Artificial intelligence, Hotel services, Technology Acceptance Model, Perceived social presence, Perceived trust, Perceived usefulness, Behavioural intention, PLS-SEM.

Introduction

The hotel sector is increasingly integrating AI-enabled services, including chatbots, virtual assistants, and service robots, to improve efficiency, personalisation, and guest experience (Liao et al., 2025). Nevertheless, the hospitality industry is historically rooted in interpersonal relationships and the overall guest experience, with the standard of service determined by the quality of human interaction and emotional connection (Kandampully et al., 2018). An AI service may therefore be technically valuable yet remain unattractive when the interaction feels difficult, unreliable, impersonal, or socially unresponsive (Jayawardena et al., 2023).

Technology acceptance research has traditionally explained adoption through perceived usefulness (PU) and perceived ease of use (PEOU). Later extensions incorporated social, cognitive, and trust-related factors that shape users' attitudes and behavioural intention (BI) toward technology use (Davis, 1989; Venkatesh and Davis, 2000). Recent hospitality research has introduced perceived trust (PT) and perceived social presence (PSP) to account for the relational qualities of AI-mediated service encounters (Al-Oraini, 2025; Prakash et al., 2023).

In AI-enabled hospitality, these constructs are often treated as parallel predictors, offering a limited explanation of how functional value becomes translated into behavioural intention within a socially sensitive service encounter. Comparatively little attention has been given to PSP as a mechanism linking usefulness with willingness to use AI-enabled service, while PT's role in strengthening usefulness remains insufficiently integrated into this process.

This study examines an extended technology acceptance model using survey data from 111 Millennial and Generation Z consumers and PLS-SEM. It contributes by positioning PSP as a proximal socio-relational mechanism through which functional value translates into behavioural intention, while clarifying perceived trust's upstream role in strengthening usefulness.

Background of Study and Research Objectives

Established technology acceptance models in hospitality: Theoretical underpinnings and challenges

The Technology Acceptance Model explains technology adoption primarily through perceived usefulness (PU) and perceived ease of use (PEOU). PU concerns whether a technology enhances performance or service outcomes, whereas PEOU concerns whether its use requires

minimal effort. Both shape behavioural intention (BI), and ease of use can enhance usefulness by allowing users to recognise and obtain the technology’s benefits (Davis, 1989).

Subsequent framework extensions integrated dimensions of social impact, cognitive-instrumental mechanisms, and the underlying drivers of user-friendliness (Venkatesh & Davis, 2000; Venkatesh & Bala, 2008). They were designed to clarify how societal norms and individual assessments of a system's performance dictate its behavioural intention. Collectively, these developments acknowledge that the decision to embrace technology is shaped by factors beyond simple utility. The user's mental processing, their social context, and their prior hands-on experience with the tool also affect their behavioural intention.

Nevertheless, hospitality AI research often examines these variables through fragmented or parallel configurations rather than as interdependent mechanisms (Kong et al., 2023; Begum et al., 2025). This is limiting in hotel services. Users evaluate chatbots, virtual assistants, and robots based on their efficiency and the quality of the interaction they create. For example, AI-enabled systems may offer speed, improved service accuracy, and a user-friendly interface, but fail in interacting and communicating with guests (Al-Hyari et al., 2023).

This study examines subjective norm (SN) and cognitive instrumental process (CIP) as antecedents of PEOU. While social validation can provide the necessary legitimacy for a novel system, a user’s mental self-assurance and conceptual grasp typically minimise the friction associated with learning and implementation. This enhanced PEOU then serves to improve perceived usefulness (PU). Furthermore, perceived trust (PT) introduces a relational dimension: users may overlook an AI system's utility if they doubt its reliability, accuracy, or data security. Consequently, trust is theorised to amplify PU by lending credibility to the service's actual functional worth (Mou et al., 2017; Prakash et al., 2023).

Modern AI platforms often utilise conversational dialogue and vocal expressions to create a sense of "perceived social presence" (PSP) through human-like cues (Prakash et al., 2023). These features shift the criteria for technology adoption beyond strictly practical assessments, such as utility or ease of use, toward whether the encounter feels socially interactive and emotionally responsive. These cues can evoke feelings of warmth and engagement when tuned effectively. However, if a system mimics humans too closely, it might trigger unease or a defensive response (Mende et al., 2019). Consequently, perceived trust (PT) and PSP serve distinct roles: PT deals with a system's dependability and credibility, while PSP focuses on the interpersonal quality of the interaction.

The potential role of perceived social presence in AI acceptance in the hotel industry

Social presence refers to the extent to which another actor is perceived as salient within an interaction (Short et al., 1976). Within AI-enabled services, it reflects whether an artificial agent is experienced as attentive, responsive, engaging, and socially present (Kreijns et al., 2022; Prakash et al., 2023). For example, a hotel chatbot that provides contextually relevant responses or a concierge robot that communicates through appropriate verbal and non-verbal cues may create a stronger sense of social interaction.

The “Computers Are Social Actors” perspective similarly proposes that people apply interpersonal expectations to technological agents (Nass and Moon, 2000). Ferdig and Mishra (2004) further show that users may experience emotional reactions, such as frustration or dissatisfaction, toward computers resembling those arising in interpersonal encounters. Furthermore, Yoganathan et al. (2021) and Prakash et al. (2023) have linked social presence in hospitality with trust, emotional responses, service evaluations, loyalty, and behavioural intention. These findings demonstrate that users respond to AI-enabled hotel services socially, particularly when the technology occupies a service role traditionally performed through interpersonal interactions.

However, PSP has been frequently treated as an outcome of anthropomorphic design or as an additional predictor operating alongside established technology-acceptance variables (Al-Oraini, 2025). Less attention has been devoted to whether it explains how functional usefulness becomes translated into BI. An accurate and helpful AI service may be experienced not only as useful but also as attentive and socially responsive (Yoganathan et al., 2021). PSP may, therefore, be the proximal mechanism connecting functional value with willingness to use the service.

This study, therefore, integrates TAM with trust and social-presence mechanisms. It assesses the antecedents of PEOU, PU, and PSP; their direct relationships with BI; and the mediating and sequential indirect pathways through which the constructs contribute to AI-service acceptance.

Methodology

Conceptual model and hypotheses

The conceptual model integrates the fundamental beliefs of the Technology Acceptance Model (TAM) with cognitive, normative, trust-based, and socio-relational mechanisms

relevant to AI-enabled hotel services. Perceived usefulness (PU) refers to the degree to which a guest feels that an AI-driven service elevates the overall standard or efficiency of their stay at a hotel. In contrast, perceived ease of use (PEOU) reflects the expectation that interacting with the technology will be straightforward and demand little mental or physical exertion. Together, these two dimensions serve as indicators of a system's practical utility, operational success, and inherent simplicity (Begum et al., 2025). Consistent with TAM, both constructs are expected to contribute to behavioural intention (BI), while PEOU is also expected to strengthen PU because technologies that are easier to operate are more likely to be perceived as functionally valuable (Davis, 1989; Venkatesh and Davis, 2000).

Being particularly important in AI-enabled service encounters, the model further incorporates perceived trust (PT) and perceived social presence (PSP) to account for relational and social dimensions. PT reflects users' confidence that an AI-enabled service is reliable, secure, and capable of performing as expected, given how AI systems handle personal data, make recommendations, or mimic human decision-making (Bhuiyan et al., 2024). Trust may strengthen PU by reducing uncertainty surrounding the technology and increasing the credibility of its functional benefits (Mou et al., 2017; Prakash et al., 2023).

Rooted in social presence theory, Perceived Social Presence (PSP) refers to the extent to which an interaction with an AI system is perceived as socially interactive, engaging, and personified (Kreijns et al., 2022). This dimension illustrates how anthropomorphic encounters, affective synchronisation, and empathic connections collectively shape a user's intention to use the technology. In the proposed model, PU is expected to strengthen PSP because an AI service that responds accurately and provides relevant assistance may be experienced as more attentive and socially engaging. PSP is subsequently expected to enhance BI.

Drawing on later extensions of technology-acceptance research, the model also incorporates subjective norm (SN) and cognitive instrumental process (CIP). SN represents perceived social expectations or support concerning the use of AI-enabled hotel services. CIP captures users' self-efficacy and effort-related cognitive evaluations of these services. Both constructs are expected to enhance PEOU by reducing the perceived cognitive effort associated with understanding and using AI-enabled service technologies (Begum et al., 2025). Therefore, the model suggests that BI is influenced by functional, cognitive, normative, relational, and social evaluations through both direct and sequential indirect pathways.

The conceptual model positions PSP as a central mechanism through which the functional value of AI-enabled hotel services may translate into a socially enriched hotel experience and stronger behavioural intention. Accordingly, the following table demonstrates our research hypotheses:

H1a	PSP positively influences BI toward using AI-enabled hotel services.
H1b	PU positively influences BI toward using AI-enabled hotel services.
H1c	PEOU positively influences BI toward using AI-enabled hotel services.
H2a	PT positively influences PU of AI-enabled hotel services.
H2b	PEOU positively influences PU of AI-enabled hotel services.
H3	PU positively influences PSP of AI-enabled hotel services.
H4a	CIP positively influences PEOU of AI-enabled hotel services.
H4b	SN positively influences PEOU of AI-enabled hotel services.
H5	PSP mediates the relationship between PU and BI toward using AI-enabled hotel services.
H6a	PU and PSP sequentially mediate the relationship between PT and BI toward using AI-enabled hotel services.
H6b	PU and PSP sequentially mediate the relationship between PEOU and BI toward using AI-enabled hotel services.

Table 1: Research Hypotheses

The model also examines the downstream indirect effects of CIP and SN on PU, PSP, and BI through the theoretically specified sequence of relationships. Accordingly, our proposed conceptual model is presented in Figure 1 below.

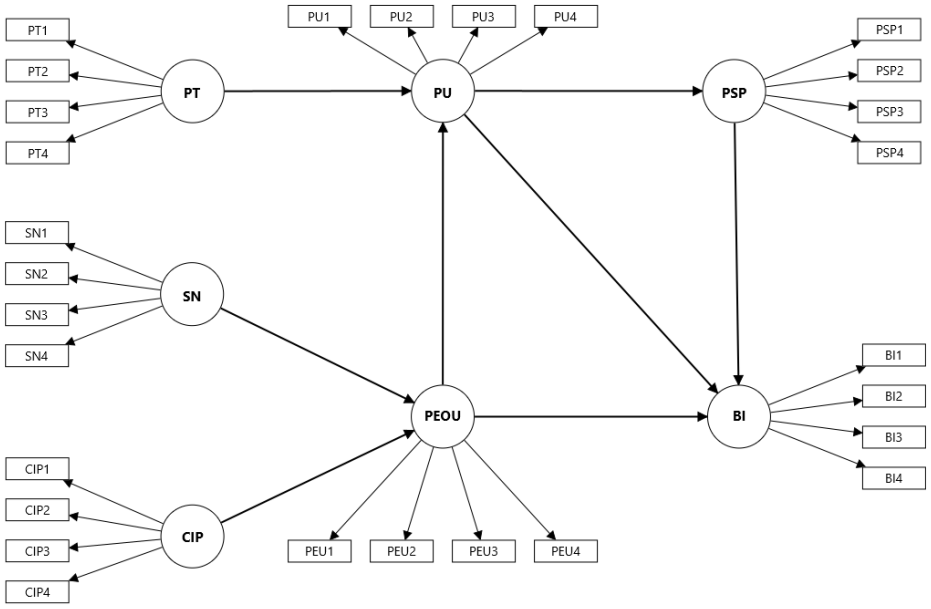


Figure 1: Proposed Conceptual Model

Data collection and sampling techniques

A quantitative, cross-sectional online survey was used to examine the technological, cognitive, relational, and social factors associated with consumers' intention to use AI-enabled hotel services. Convenience and snowball sampling recruited Millennial and Generation Z respondents, who were selected because of their familiarity with digital and AI-enabled services (Chin et al., 2024). Initial participants shared the survey with eligible members of their networks. Although this approach facilitated access to the target population while ensuring consistent questionnaire presentation, it was non-probability-based and may overrepresent digitally connected respondents, limiting representativeness and population-level generalisability (Emerson, 2015; Evans and Mathur, 2018). The findings should therefore be interpreted as exploratory concerning the relationships among the constructs within the sampled population rather than as population-level estimates for all hotel consumers.

The questionnaire contained 28 reflective indicators measuring the seven constructs in the conceptual model. The measurement items were adapted from established scales: PU and PEOU from Davis (1989); BI from Davis et al. (1989); SN from Venkatesh and Davis (2000) and Kaushik et al. (2015). CIP was operationalised through items measuring respondents' self-efficacy and effort-related cognitive evaluations of AI-enabled customer service, adapted from Venkatesh (2000) and Venkatesh et al. (2003). PT items were adapted from Gefen (2002), Kim et al. (2011), and Prakash et al. (2023), while PSP items were adapted from Gefen and Straub (2004), Toader et al. (2020), and Al-Oraini (2025). All items were contextualised to AI-enabled hotel customer service.

Responses were gathered using a five-point Likert scale, ranging from 1 = "strongly disagree" to 5 = "strongly agree." To ensure ethical standards, participation was entirely voluntary and anonymous, with all respondents providing informed consent before starting. A preliminary pilot study with ten participants confirmed the instrument's viability, leading only to minor phrasing adjustments for better readability. The data collection window lasted for one month. The study required that participants had interacted with or were aware of AI-powered customer service and had stayed in a hotel within the past year. Once collected, the data were checked for outliers and completeness before the PLS-SEM modelling. In total, 111 usable responses were included in the final analysis, with a clean dataset showing no missing values across the 28 indicators.

Data analysis approach

The model was analysed using PLS-SEM in SmartPLS 4 because the study was explanatory and theory-extending (Ringle et al., 2024). The proposed research model sought to explain variance in BI while estimating a model containing multiple latent constructs and sequential indirect relationships among technological, cognitive, normative, relational, and social variables (Ramayah et al., 2018). All seven constructs were specified as reflective measurement models.

The measurement model was evaluated through indicator loadings, Cronbach's alpha, rho_A, composite reliability, and average variance extracted (AVE). Discriminant validity was assessed through the heterotrait–monotrait ratio of correlations (HTMT). The structural model was evaluated using inner variance inflation factors (VIF), path coefficients, and coefficients of determination (R^2), along with effect sizes (f^2), total effects, and specific indirect effects. Additionally, the standardised root mean square residual (SRMR) was calculated to provide a supplementary measure of the overall model fit. Significance was evaluated through 5,000 bias-corrected and accelerated bootstrap samples using two-tailed tests at .05. Because PLSpredict was not conducted, R^2 is interpreted as in-sample explanatory power rather than out-of-sample predictive performance.

Main Findings and Results

Measurement-model assessment

The measurement-model results demonstrated satisfactory reliability and convergent validity. All indicator loadings were significant and ranged from .524 to .945. Two PEOU indicators loaded below .70 but were retained because PEOU demonstrated acceptable composite reliability, AVE, and content coverage. Cronbach's alpha ranged from .825 to .942, rho_A from .847 to .943, composite reliability from .820 to .942, and AVE from .541 to .801. HTMT values ranged from .311 to .896, and no bootstrapped interval included 1.00, although the PT–PU value approached .90. Inner VIF values ranged from 1.000 to 3.335. The saturated and estimated SRMR values were .063 and .086, respectively; accordingly, interpretation emphasises measurement quality, structural relationships, and explanatory power.

Structural-model results and direct effects

The structural model explained substantial variance in its principal endogenous constructs. The R^2 values were .761 for PEOU, .851 for PU, .453 for PSP, and .839 for BI. PSP was the

only significant direct predictor of BI (β = .592, p < .001), whereas the direct effects of PU (β = .211, p = .152) and that of PEOU (β = .216, p = .102) on BI were nonsignificant. PT positively predicted PU (β = .661, p < .001), PEOU positively predicted PU (β = .321, p = .008), and PU positively predicted PSP (β = .673, p < .001). CIP (β = .671, p < .001) and SN (β = .327, p < .001) both positively predicted PEOU. $H1_a$, $H2_a$, $H2_b$, H3, $H4_a$, and $H4_b$ were therefore supported, whereas $H1_b$ and $H1_c$ were not.

Figure 2 below shows the complete structural model results.

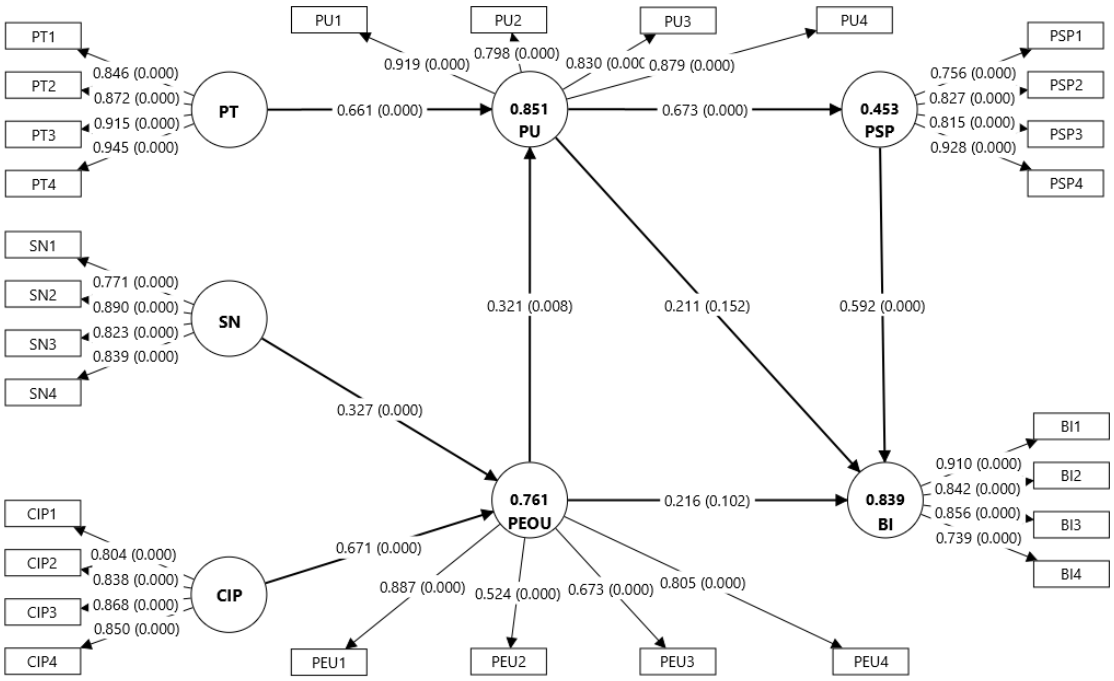


Figure 2: Structural model results (SmartPLS 4)

Indirect and total effects

PSP mediated the PU–BI relationship (β = .398, p < .001), supporting H5. PEOU had a significant sequential indirect effect through PU and PSP (β = .128, p = .010), supporting $H6_b$. PT also influenced BI through PU and PSP (β = .263, p < .001), supporting $H6_a$, whereas its shorter indirect effect through PU alone was nonsignificant (β = .139, p = .151). Trust, therefore, appears to influence behavioural intention not merely by increasing perceptions of usefulness, but by enabling usefulness to be experienced as a more socially engaging AI interaction.

CIP and SN also exerted significant downstream effects on BI through PEOU. Their total indirect effects were β = .276 (p = .001) and β = .134 (p = .010), respectively, while their corresponding serial pathways through PEOU, PU, and PSP were β = .086 (p = .015) and β =

.042 (p = .050), respectively. Collectively, these results suggest that cognitive instrumental evaluations and normative influences contribute to behavioural intention indirectly: they enhance PEOU, which strengthens PU and subsequently PSP before influencing BI. The findings therefore reinforce the central role of PSP as the proximal mechanism through which these supporting TAM-related antecedents translate into behavioural intention.

The total effects further illustrate these mechanisms. PU had the largest total effect on BI (β = .609, p < .001), followed by PSP (β = .592, p < .001), PEOU (β = .411, p < .001), PT (β = .402, p < .001), CIP (β = .276, p = .001), and SN (β = .134, p = .010). Taken together, the findings identify PSP as the principal direct predictor of BI and as the central mediating mechanism through which PU influences behavioural intention. PT, PEOU, CIP, and SN also contribute to BI through sequential indirect pathways that ultimately operate through PSP. These findings suggest that social presence acts as the proximal mechanism transforming users' functional, cognitive, relational, and normative evaluations of AI-enabled hotel services into their behavioural intention.

Theoretical Contribution and Managerial Implications

Theoretical contribution

Prior research has established PU, PEOU, PT, SN, and CIP as central explanations of BI (Davis, 1989; Venkatesh and Davis, 2000; Mou et al., 2017). Hospitality research has also recognised perceived social presence (PSP) as relevant to guests' responses to service robots, chatbots, and other AI-enabled interfaces (Yoganathan et al., 2021; Prakash et al., 2023). However, these constructs have frequently been examined as parallel or additive predictors, offering a limited explanation of how functional, cognitive, normative, and relational evaluations combine to produce acceptance in a service context traditionally characterised by interpersonal interaction. This study offers a more process-oriented account.

First, within the estimated model, neither PU nor PEOU directly predicted BI; PSP was the only significant direct predictor. This finding challenges an exclusively functional interpretation of technology acceptance and indicates that, within AI-enabled hotel services, perceptions of usefulness and ease may be insufficient to generate behavioural intention unless the interaction is also experienced as socially responsive, engaging, and human-like.

Second, although PU had the largest total effect, it operated predominantly through PSP. Thus, usefulness should not be viewed only as a terminal belief that directly generates intention. In

human-centred service settings, functional value may need to be translated into a socially meaningful interaction before it produces willingness to use the technology. This positions PSP as a proximal socio-relational mechanism connecting the instrumental value of AI-enabled services with behavioural intention.

Third, the findings clarify the theoretically distinct roles of perceived trust (PT) and PSP. PT strongly enhanced PU but did not influence BI through PU alone. Its effect became significant through the sequential pathway PT → PU → PSP → BI. Trust, therefore, appears to validate the credibility and functional value of the AI service, whereas PSP converts that value into a socially engaging experience that supports intention. This distinction integrates trust-based extensions of TAM with social presence theory without treating trust and social presence as interchangeable constructs.

Finally, subjective norm (SN) and cognitive instrumental process (CIP) emerged as distal antecedents rather than immediate drivers of BI. Both enhanced PEOU and subsequently influenced PU, PSP, and BI through sequential indirect pathways. The study therefore advances a process-oriented account of acceptance in which normative and cognitive evaluations facilitate ease of use, ease strengthens usefulness, and usefulness contributes to intention through social presence.

The study, therefore, integrates TAM and social presence theory by positioning PSP as the proximal mechanism linking instrumental evaluations with behavioural intention. This contribution is bounded by the cross-sectional, non-probability sample of digitally familiar Millennial and Generation Z respondents and is most applicable where AI supplements or replaces traditionally interpersonal hotel services.

Managerial implications

Hotel executives, customer-experience managers, and technology providers should jointly manage usefulness, trust, and social presence. Chatbots, virtual assistants, and service robots should deliver clear practical value through faster replies, reliable information, personalised support, and continuous assistance. They should also use context-aware wording, conversational continuity, and prompt acknowledgement of requests to convey measured social responsiveness. However, human-like cues should communicate responsiveness rather than imitate employees excessively, because exaggerated anthropomorphism may create discomfort or appear manipulative.

Trust in AI-enabled hotel services should be reinforced through clear data-governance practices, consistent system performance, explainable recommendations, and straightforward routes to human assistance. Guests need to understand what data are gathered, why they are used, and under what conditions an automated response can be reconsidered by staff. The key managerial tension lies in balancing personalisation with privacy: richer data may enhance usefulness and social responsiveness, but it can also heighten perceived risk.

Finally, onboarding instructions, demonstrations, staff endorsement, and intuitive interfaces should be adapted to guests' digital familiarity and task sensitivity. Operationally, the strongest strategy is therefore not to replace human service indiscriminately, but to combine functional efficiency, calibrated social interaction, transparent trust-building, and human support. This approach can increase adoption while protecting the relational character of the hotel experience.

Conclusion

This study shows that AI-service acceptance in hotels depends on more than functional value. PSP directly predicted BI and mediated the influence of PU, while PT, PEOU, SN, and CIP contributed through sequential indirect mechanisms. The findings distinguish trust as an antecedent of usefulness from social presence as the mechanism translating usefulness into adoption intention. This suggests that the functional value of AI-enabled hotel services may be insufficient to generate behavioural intention unless it is translated into an interaction that users perceive as responsive, engaging, and socially present.

Several limitations qualify these conclusions. The cross-sectional, self-reported design cannot establish temporal or causal ordering and may be affected by common-method variance and social-desirability bias. The non-probability sample of 111 Millennial and Generation Z respondents limits representativeness, while BI does not establish actual use. Treating chatbots, virtual assistants, and robots as one category may conceal differences in embodiment, task sensitivity, privacy risk, and interpersonal intensity. Two PEOU indicators had comparatively low loadings, suggesting that the measurement of this construct could be refined. The reflective specifications, causal ordering, and lack of out-of-sample prediction also constrain interpretation.

Future research may use longitudinal, experimental, and field designs, link perceptions with actual usage or booking behaviour, and employ broader probability-based samples. Studies

should compare specific AI technologies and manipulate social cues, transparency, privacy risk, task sensitivity, and human-escalation options to identify when social presence supports or undermines acceptance. Alternative specifications, measurement invariance, improved PEOU and CIP measures, endogeneity remedies, and out-of-sample prediction would further test the robustness and boundaries of the model.

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ADVANCING RURAL WOMEN'S SOCIAL ENTREPRENEURSHIP: HOW INNOVATION PROCESSES SHAPE STRATEGIC DECISION-MAKING

Georgios Afxentiou[1]

[1] Georgios Afxentiou Research Laboratory, Larnaca, Cyprus

Keywords: Innovation processes, strategic decision-making, women social entrepreneurs, rural development.

Abstract

This research examines how innovation processes and strategic decision-making are fundamental to rural venture creation. Drawing on the Get Ready to Innovate (GRTI) model, this conceptual study adapts its innovation framework to assess the significance of women entrepreneurs' strategic decision-making during the proposed Session 5 in designing and implementing social ventures to support rural development. It contributes to the literature on rural entrepreneurship and women's social innovation by advancing a process-based understanding of how strategic thinking evolves under conditions of institutional constraints, resource scarcity, and socio-economic uncertainty. Furthermore, it offers theoretical implications for innovation research and practical insights for practitioners aiming to enhance rural women-led social ventures.

Introduction

Social innovation initiated by women in local communities is critical for ensuring long-term sustainability and future development. Women-led initiatives depend on processes that enable the generation and development of new ideas within local contexts. This conceptual study examines how social innovation processes enhance women entrepreneurs' strategic decision making in rural venture creation. Pozzebon and Fontenelle (2018) explained that social entrepreneurship and innovation meet social challenges and contribute to sustainable development. Bezerra-de-Sousa et al. (2022) explained that social innovation evolves through a complex process (Cloutier, 2003; Westley & Antadze, 2010), engaging many actors (Kolk & Lenfant, 2015; Phillips, Lee, Ghobadian, O'Regan, & James, 2015; Saji & Ellingstad, 2016) to meet social objectives. Belayutham et al. (2019), Vézina, Ben Selma, and Malo (2019), and

Foroudi, Akarsu, Marvi, and Balakrishnan (2020) argued that further research is necessary to examine social processes, whereas Carl (2020) emphasised the importance of understanding the phenomenon from a goal-oriented perspective.

The objectives are:

1. To examine the role of innovation processes in enhancing the strategic decision-making capabilities of women entrepreneurs engaged in rural social venture creation.
2. To develop the Get Ready to Innovate (GRTI) model by incorporating strategic decision-making into the proposed Session 5 as a fundamental component of the innovation process, thereby strengthening its application to rural social venture creation.

Research gap

While the original GRTI model provides a structured understanding of innovation processes, it does not explicitly explain how strategic decisions concerning institutional constraints, resource scarcity, and socio-economic uncertainty affect rural venture formation.

Literature review and theoretical framework

Biehle and Wilpert (2023) defined social innovation as an initiative of members of a civic society to meet the needs of a group or community that existing policies and public services do not adequately address (Moulaert and Mac-Callum 2019). A few examples of social issues include employment, poverty, housing, climate, and health care, and is targeted toward groups in great need (Zulkefly, 2021; Engelke et al., 2015; Kostetska and Berezyak, 2014; Mulgan, 2006).

The Get Ready to Innovate (GRTI) model is adopted in this study to examine how women's strategic decision-making during the proposed Session 5 can support the development of social ventures.

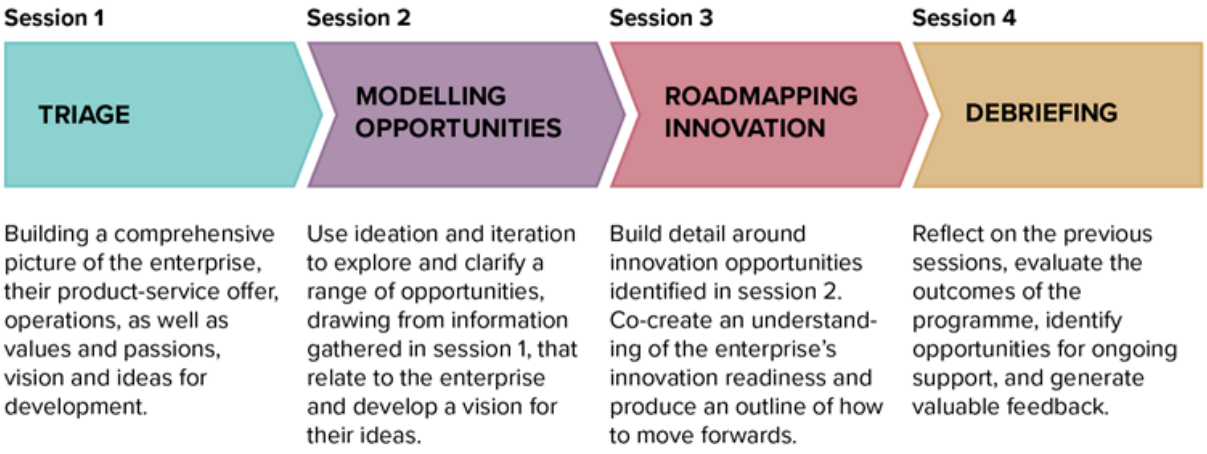


Figure 1: GRTI model, Source: Hemstock et al. (2022)

Methodology and methods

The GRTI model and literature on social innovation and strategic decision-making constitute the theoretical foundation of this study. The model has been designed and validated by the School of Design at Northumbria University. It was implemented in the North East UK, Yerevan, Armenia and Birmingham, United States. During these phases, the design facilitators and participants had the opportunity to analyze business profiles, trace their needs, identify innovation opportunities, and reflect on the outcomes of the sessions (Hemstock, 2022).

Expected findings and contribution

The expected findings should provide both a theoretical and practical framework for understanding the significance of strategic decision-making on the formulation of social ventures while addressing the pressing needs of a community.

Originality and value

The study's originality is grounded in the significance of strategic-decision making within the innovation processes using a validated model to enhance the sustainability of social ventures.

Research limitations

An empirical testing of the impact of strategic decision-making in the innovation phases could provide valuable insights about the social venture development.

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STRATEGIC RISK ABSORPTION THROUGH CONSULTING IN INNOVATION PROCESSES

Turgut, Gokhan
Université du Québec à Montréal, Montréal, Canada

Keywords: Strategic risk, management consulting, innovation, dynamic capabilities, risk governance, uncertainty, knowledge brokerage

Introduction

Innovation initiatives expose firms to technological, market, organisational and reputational risks. While innovation is essential for long-term competitiveness, many organisations struggle to balance opportunity seeking behaviour with disciplined risk management. Recent research emphasises the growing importance of strategic flexibility, adaptability and resilience in environments characterised by disruption and uncertainty.

Purpose, Aim and Objectives

This study aims to conceptualise management consulting as a strategic risk absorption and mitigation mechanism within innovation processes. The research addresses a gap in strategic management and risk governance literature by examining how external consultants contribute to innovation success beyond their traditional role as expertise providers. The central research question is: Through which mechanisms do consulting interventions reduce strategic risk and enhance strategic adaptability during innovation initiatives?

Literature Review and Theoretical Framework

The framework integrates dynamic capabilities theory, the knowledge-based view, institutional theory and risk governance literature. Dynamic capabilities research suggests organisations must sense opportunities, seize them and reconfigure resources under changing conditions. Recent work on strategic innovation and flexibility highlights the importance of adaptation capabilities in turbulent environments. Consulting research further identifies consultants as knowledge brokers, sensemaking agents and facilitators of organisational learning. Building on these streams, the study

argues that consultants operate as external risk governance actors who absorb uncertainty, legitimise strategic choices and structure experimentation processes.

Methodology and Methods

This paper adopts a conceptual theory-building methodology. A structured review and synthesis of literature from strategic management, innovation management, risk governance and management consulting are used to develop an integrative framework. The framework development process identifies recurring mechanisms discussed across theoretical perspectives and synthesises them into a set of conceptual propositions. Specifically, the analysis focuses on how consulting engagements contribute to innovation risk assessment, uncertainty reduction, organisational learning, strategic legitimacy and adaptive capability development.

Main Findings and Contribution

The conceptual analysis identifies four primary consulting-based risk absorption mechanisms: knowledge transfer, legitimacy creation, structured experimentation and adaptive capability development. Consultants reduce uncertainty by introducing specialised knowledge and external perspectives. They legitimise innovation decisions before internal and external stakeholders, thereby reducing political and organisational resistance. Through scenario planning, prototyping and pilot projects, consultants support structured experimentation that limits downside exposure. Finally, consultants contribute to organisational learning and capability development, improving firms' ability to manage future innovation risks. The study proposes that these mechanisms collectively transform consultants from advisory actors into strategic risk buffers.

Originality and Value

The originality of the study lies in reframing management consulting as an externalised strategic risk governance function. Rather than viewing consultants solely as providers of expertise, the framework positions them as absorbers and moderators of innovation-related uncertainty. This perspective integrates previously fragmented literature streams into a unified explanation of consulting value creation.

Research Limitations

The paper is conceptual and does not empirically test the proposed framework. Future research should examine the framework through qualitative case studies, comparative consulting engagements and quantitative testing across different innovation contexts. Boundary conditions including radical versus incremental innovation and consultant dependence should also be explored.

Theoretical and Practical Applications and Implications

The study contributes to theory by extending innovation and risk governance research to include external actors within strategic risk management processes. For practitioners, the framework provides guidance on designing consulting engagements that enhance innovation performance while controlling uncertainty. It highlights the governance structures and intervention mechanisms through which consulting can support responsible innovation and strategic adaptation.

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AI ADOPTION IN SMES: A FRAMEWORK FOR PRACTITIONERS

Bounti, Antigoni-Josephina; Farmakis, Timoleon

Athens University of Economics and Business, Athens, Greece

Keywords: AI Adoption, SMEs, Digital Transformation, AI Automation, AI Augmentation, Design Science Research, Organisational Readiness.

Abstract

Digital transformation is a strategic priority for contemporary organisations, extending beyond technology adoption to changes in business processes and decision-making. Artificial Intelligence (AI) is widely recognised as a key enabler of this transformation, yet its adoption in small and medium-sized enterprises (SMEs) remains limited, constrained by scarce resources, fragmented data, limited expertise, and a lack of structured guidance. Established adoption theories explain why adoption occurs but offer little direction on how SMEs should operationalise it. This study develops and evaluates the AI Adoption Framework for SMEs, a structured, process-oriented methodology for adopting AI-enabled automation in resource-constrained environments. Grounded in a Design Science Research approach, the framework guides organisations through five phases: readiness assessment; process discovery and prioritisation; AI solution design and implementation; implementation planning and organisational embedding; and deployment, evaluation, and continuous improvement. Its applicability is demonstrated through a case study in a Greek SME and evaluated through structured expert feedback, illustrating its value for evidence-based decision-making, incremental adoption, and sustainable digital transformation.

Introduction

Digital transformation (DT) has become a strategic priority for contemporary organisations, extending beyond technology adoption to changes in processes, business models, and decision-making (Warner and Wäger, 2019; Doukidis et al., 2020). Artificial Intelligence (AI) is widely recognised as a central enabler of this transformation, shifting from isolated applications to integrated capabilities that reshape how work is performed and value is created (Davenport and Ronanki, 2018; Mikalef et al., 2019). This matters disproportionately for small and medium-sized enterprises (SMEs), which account for roughly 90% of businesses and over half of global employment (Sánchez et al., 2025); even incremental gains in their core processes carry substantial aggregate economic weight.

A substantial body of research explains why organisations adopt, or fail to adopt, AI. Established theories such as the Technology, Organization and Environment (TOE) framework and the Diffusion of Innovations (DOI) perspective identify the technological, organisational, and environmental

determinants of adoption (Zhu et al., 2006; Moore and Benbasat, 1991). In SMEs specifically, the literature consistently documents the barriers that constrain uptake: limited financial resources, scarce specialised skills, low data quality and fragmentation, legacy systems, and resistance to change (Ghobakhloo et al., 2012; Doukidis et al., 2024; Mohib et al., 2025; Sánchez et al., 2025).

What remains far less understood is how SMEs should operationalise adoption, how to move from a state of readiness to AI that is implemented, embedded in workflows, and generating measurable value. Despite increasingly accessible cloud-based and low-code tools (Farmakis, 2025), adoption in SMEs remains confined to isolated experimentation rather than systematic integration (Mikalef et al., 2019; Oludapo et al., 2024). Crucially, the dominant theoretical lenses are explanatory: TOE and DOI describe the conditions and perceptions surrounding adoption but offer limited prescriptive guidance on how AI-enabled automation should be designed, implemented, and scaled (Enholm et al., 2022). They are not constructed to be "tested" into an implementation method; re-applying them would, at best, re-confirm known determinants. The result is a structural gap between explanation and execution, and an absence of process-oriented methodologies covering the full adoption lifecycle in resource-constrained settings (Rai et al., 2019).

This gap has practical consequences. Without structured guidance, SMEs initiate AI projects without a clear understanding of their readiness or implementation requirements, which increases failure risk and leaves AI peripheral rather than transformative (Enholm et al., 2022; Oludapo et al., 2024). Access to AI technology alone is therefore insufficient; what is missing is a means of translating availability into integration and sustained value.

To address this gap, this study develops and evaluates the AI Adoption Framework for SMEs, a structured, process-oriented methodology that guides SMEs through AI-enabled automation under resource constraints, from readiness assessment through to continuous improvement. Rather than replacing TOE and DOI, the framework builds on them, translating their explanatory constructs into a prescriptive adoption pathway. The study adopts a Design Science Research (DSR) approach (Hevner et al., 2004; Peffers et al., 2007), demonstrating the artefact through a case study in a Greek SME and evaluating it through structured expert feedback. The research is guided by an overarching question, how can resource-constrained SMEs systematically adopt AI-enabled automation across the full lifecycle?, addressed through two sub-questions:

RQ1. How can SMEs assess their organisational, technical, data, and human readiness for AI-enabled automation and, on that basis, identify and prioritise the business processes most suitable for it, in a structured, evidence-based way?

RQ2. How can SMEs design, pilot, and evaluate AI solutions under uncertainty and limited tolerance for failure, balancing feasibility and managerial priorities across the adoption lifecycle to support staged, low-risk implementation and continuous improvement?

Theoretical Background and Related Work

AI adoption in SMEs

AI adoption in SMEs is increasingly characterised by experimentation, enabled by accessible cloud-based and user-friendly tools (Schwaeke et al., 2025). However, adoption remains fragmented, with technologies often introduced as stand-alone solutions that limit their digital transformation potential (Doukidis et al., 2020). Despite accounting for around 90% of businesses and over 50% of global employment, SMEs exhibit limited and uneven AI use in core processes (Sánchez et al., 2025). Only 6% of Greek SMEs and 8% across the EU have adopted AI in a structured way, although approximately 31% interact with AI tools; adoption rises with firm size, from 23% in micro-enterprises to 40% in medium-sized firms, reflecting differences in resources (National Bank of Greece Group, 2025). In practice, AI applications are concentrated in low-risk areas such as marketing and customer interaction, delivering incremental gains while remaining weakly embedded in workflows. Adoption therefore remains largely peripheral rather than transformative, exposing a persistent gap between technological availability and effective organisational integration, the gap this study addresses.

Barriers to AI adoption in SMEs

The literature identifies interrelated organisational, financial, data-related, technical, and infrastructural barriers that constrain AI adoption in SMEs (Ayinaddis, 2025). Organisational factors such as resistance to change, limited managerial awareness, and weak process ownership impede integration into core processes (Doukidis et al., 2020; Ghobakhloo and Iranmanesh, 2021). Financial constraints, limited capital, scarce human resources, and uncertainty regarding return on investment, reinforce cautious adoption (Mohib et al., 2025). Data-related challenges, including low data quality, fragmentation, and weak governance, limit feasibility and erode trust in AI outputs (Sánchez et al., 2025; Bianchini and Lasheras Sancho, 2025). Technical and integration constraints, such as legacy systems and poor interoperability, increase complexity (Farmakis et al., 2025), while insufficient infrastructure in data storage, cloud maturity, cybersecurity, and computational capacity further restricts deployment and scalability (Schwaeke et al., 2025). Critically, these barriers are interdependent rather than isolated: addressing them requires a sequenced, lifecycle approach rather than one-off interventions, a requirement that motivates the framework developed in this study.

Existing frameworks and the gap between explanation and execution

Research on AI adoption has drawn extensively on established technology-adoption theories, most prominently the Technology, Organization and Environment (TOE) framework and the Diffusion of Innovations (DOI) perspective (Tornatzky and Fleischer, 1990; Rogers, 2003; Zhu et al., 2006; Moore

and Benbasat, 1991). Together they offer complementary structural and behavioural explanations of adoption.

TOE conceptualises adoption as the outcome of interactions between three contextual dimensions, technological, organisational, and environmental conditions (Zhu et al., 2006). Applied to AI in SMEs, the technological dimension captures data availability and quality, system compatibility, and infrastructure; the organisational dimension encompasses leadership support, skills, financial capacity, and readiness for change; and the environmental dimension reflects regulatory requirements, competitive pressure, and access to innovation ecosystems (Sánchez et al., 2025; Mohib et al., 2025). TOE thus provides a systematic lens for explaining why adoption is more or less likely and why outcomes vary across firms.

Complementing this structural focus, DOI explains adoption as a behavioural and temporal process shaped by managerial perceptions, learning, and experience, emphasising innovation attributes such as relative advantage, compatibility, complexity, trialability, and observability (Moore and Benbasat, 1991; Rogers, 2003). In SMEs, where decisions are closely tied to the attitudes of owners and managers and to limited risk tolerance, trialability and observability are particularly influential, encouraging pilots and proofs-of-concept rather than large-scale commitment (Ghobakhloo et al., 2012; Mohib et al., 2025). DOI therefore helps explain why AI adoption often progresses incrementally and stalls at early experimentation.

Despite their explanatory power, both perspectives share a fundamental limitation: they describe the determinants and dynamics of adoption but offer little guidance on how organisations should move from readiness and experimentation toward structured implementation, process integration, and systematic evaluation (Enholm et al., 2022; Sánchez et al., 2025). They are explanatory rather than prescriptive, and are not designed to be operationalised, or "tested", into an implementation method. This gap between explanation and execution is especially consequential for AI, where value depends on coordinated changes across workflows, decision routines, and governance rather than on the adoption decision itself (Oludapo et al., 2024). Although prior research recognises the importance of experimentation, pilot implementation, and iterative learning (Rai et al., 2019), it does not connect these elements into a coherent adoption pathway. This distinction has a direct methodological implication. Empirically retesting TOE or DOI, for instance by confirming which contextual factors predict adoption in a given sample (Sánchez et al., 2025), would clarify why adoption varies but would not, in itself, tell an SME how to assess its readiness, select processes, design pilots, or embed solutions. Retesting is therefore a legitimate but different research objective: it produces explanatory knowledge, whereas the problem identified here calls for prescriptive, design knowledge. This study therefore treats TOE and DOI as a tested diagnostic foundation and, through a Design Science Research approach, operationalises their constructs, such as contextual readiness conditions and

diffusion mechanisms like trialability and observability, into an actionable, sequenced methodology for the full AI adoption lifecycle in SMEs.

Research Methodology

This study adopts a Design Science Research (DSR) approach (Hevner et al., 2004; Peffers et al., 2007). DSR is well suited to the research problem because the gap identified is prescriptive rather than explanatory: the objective is not to explain the determinants of AI adoption, which TOE and DOI already do, but to design and evaluate an artefact that helps SMEs act on those determinants. DSR addresses real-world problems through the construction and evaluation of artefacts (constructs, models, methods, or instantiations), balancing practical relevance with scientific rigour (vom Brocke et al., 2020). The artefact developed here is a method artefact: the AI Adoption Framework for SMEs. Accordingly, the study does not test hypotheses derived from TOE or DOI; it constructs and evaluates an artefact that operationalises their insights. This is a design problem rather than an explanatory one, and selecting the paradigm that fits the question is itself a condition of rigour (Hevner et al., 2004).

The research follows the canonical DSR process, problem identification and motivation, definition of objectives, design and development, demonstration, evaluation, and communication. Table 1 maps each phase to the methods and activities applied and the corresponding outputs, providing a transparent account of how theoretical insights, empirical evidence, and design decisions were integrated.

DSR Phase	Activities	Outputs
Problem Identification & Motivation	Literature review; analysis of SME constraints; exploratory interviews and observations	Defined problem; identified gaps; justification for methodology
Definition of Objectives	Research questions; artefact requirements; key components (readiness, prioritisation, implementation, evaluation)	Framework objectives, expected outcomes, and success criteria
Design & Development	Framework design; structuring of phases and activities; development of tools (e.g., scorecards, templates)	AI adoption framework; structured methodology; supporting tools
Demonstration	Application in the SME context; execution of selected phases; use of empirical data	Application in the SME context; execution of selected phases; use of empirical data
Evaluation	Case-based demonstration; evidence of feasibility and applicability	Evaluation results: strengths, limitations, and refinement insights
Communication	Documentation and presentation of the framework and findings	Communicated framework; academic and practical contributions

Table 1: Research Approach & Methodology

Generating the framework

The framework was not derived deductively from a single theory but synthesised from multiple inputs through the DSR cycle. In the problem-identification phase, a review of AI-adoption and digital-transformation literature, combined with analysis of SME-specific constraints and exploratory

observation in the case organisation, established the design problem and its boundary conditions. These insights were translated into artefact requirements: the framework had to be process-oriented, incremental, technology-agnostic, and explicitly constrained by typical SME limitations, limited resources, fragmented data, informal processes, and scarce expertise, which were embedded as design assumptions rather than treated as exceptions.

The framework's structure follows directly from these requirements. Each of the five phases was designed to address a distinct class of challenge identified in the literature and to produce well-defined intermediate outputs that serve as inputs to the next phase, ensuring traceability between diagnosed problems, design decisions, and evaluation activities. Supporting tools, the AI readiness scorecard, the pain-point and task-suitability templates, the prioritisation criteria, and the governance and roadmap templates, were developed to make each phase operational. The artefact was then refined iteratively: case demonstration surfaced practical adjustments, while structured expert feedback informed targeted clarifications, consistent with the cycle of relevance and rigour central to DSR.

Case selection and data collection

The framework was demonstrated through a single in-depth case study in a Greek SME operating in the automotive retail sector. The organisation was selected because it exhibits constraints typical of many SMEs, low digital maturity, heavy reliance on manual data handling, fragmented information systems, and limited automation, making it a representative, information-rich setting in which to instantiate and observe the framework. Within DSR, a single demonstration case is an accepted means of establishing the feasibility and applicability of an artefact; the aim is analytical insight into how the framework operates in context, not statistical generalisation (Peffers et al., 2007; vom Brocke et al., 2020).

Evidence was collected through triangulated qualitative methods: analysis of process documentation and workflows, direct observation of operations, and semi-structured interviews with leadership and operational staff. Selected phases were instantiated in practice, including a bounded proof-of-concept pilot used to evaluate feasibility, usability, and organisational fit. Because the later phases depend on longer-term, post-deployment conditions that exceeded the study's timeframe, their evaluation was complemented by structured feedback from three experienced practitioners, a Head of Technology and AI, a senior consultant at a global professional-services firm, and an SME-focused transformation consultant. This expert evaluation provides an additional, independent assessment of the framework's realism and transferability, partially mitigating the limitations of a single case.

Results and Discussion

The primary artefact is the AI Adoption Framework for SMEs (Figure 1): a five-phase, iterative methodology that guides SMEs through AI-enabled automation while progressively building

capability and minimising risk. Each phase produces outputs that feed the next, ensuring traceability from problems to evaluation. It was demonstrated in the case organisation, with observations reported alongside each phase.



Figure 1: AI Adoption Framework for SMEs (iterative five-phase methodology)

Phase 1: Readiness assessment

Phase 1 establishes an evidence-based view of the SME's preparedness through four activities: maturity assessment across organisational, technical, and data dimensions from triangulated evidence; leadership and employee interviews or surveys to capture perceptions not visible in structural analysis; strategic goals and resources to translate priorities into automation objectives within resource constraints; and the AI Readiness Scorecard (Table 2), which yields a differentiated readiness profile. In the case, this profile showed a fragmented environment with low data maturity and limited advanced skills, defining the scope for later phases.

Dimension	Criteria	Key Indicators	Rating (1 to 5)
Organisational	Leadership commitment	Executive support, AI vision, resource allocation	1 to 2: ad hoc / 3: limited / 4 to 5: strong, consistent
	Strategic alignment	AI linked to strategy, roadmap, automation priorities	1 to 2: none / 3: partial / 4 to 5: fully integrated
	Governance & policy	Roles, accountability, compliance	1 to 2: informal / 3: inconsistent / 4 to 5: clear governance
	Change management	Communication, employee involvement	1 to 2: high resistance / 3: basic / 4 to 5: strong capability
Technical	System integration	ERP/CRM integration, APIs, data flows	1 to 2: legacy/manual / 3: partial / 4 to 5: highly integrated
	Infrastructure maturity	Cloud, cybersecurity, scalability	1 to 2: outdated / 3: adequate / 4 to 5: stable, secure
	Automation capabilities	RPA/workflows, analytics usage	1 to 2: manual / 3: partial / 4 to 5: advanced
	Technology investment	Lifecycle, innovation budget	1 to 2: none / 3: ad hoc / 4 to 5: proactive
Data	Availability	Digital records, historical coverage	1 to 2: fragmented / 3: partial / 4 to 5: comprehensive
	Quality	Accuracy, completeness, structure	1 to 2: low / 3: mixed / 4 to 5: high-quality
	Accessibility	Retrieval, sharing, centralisation	1 to 2: siloed / 3: partial / 4 to 5: centralised
	Governance	Policies, GDPR, ownership	1 to 2: none / 3: partial / 4 to 5: strong
Human	Digital literacy	Basic tools, ERP/CRM usage	1 to 2: low / 3: moderate / 4 to 5: high
	Technical skills	IT, analytics, AI expertise	1 to 2: none / 3: limited / 4 to 5: strong
	Training & development	Programs, participation	1 to 2: none / 3: occasional / 4 to 5: structured
	Cultural openness	Attitudes, trust, job impact	1 to 2: resistance / 3: mixed / 4 to 5: high openness

Table 2: AI Readiness Scorecard

Phase 2: Process discovery and prioritisation

Phase 2 identifies, assesses, and prioritises automation opportunities at the process level. Process mapping documents core end-to-end processes through a high-level inventory and detailed “as-is” models. Pain-point identification then surfaces inefficiencies; in the case these were largely systemic, with spreadsheet-based coordination acting as an informal integration layer. Task-level suitability assessment judges whether the activities behind each pain point suit AI (Table 3), and prioritisation (Table 4) ranks suitable candidates across strategic alignment, organisational support, expected success, and deliverability into a ranked pilot portfolio.

Process	Observed pain point (inefficiency type)	Repet.	Data avail. & structure	Tech. feasib.	Org. readiness	AI suitability	Justification
Supplier invoice handling	Manual validation, reconciliation, cross-checking (error-prone; rework)	High	Medium	High	Medium	Suitable	Repetitive, rule-based; subject to data quality
Monthly market analysis	Spreadsheet tracking replacing system integration (duplication; no real-time visibility)	Medium	Medium	Medium	Medium	Conditionally feasible	Analytical decision support on structured data
Payment execution	Email-based approvals, informal coordination (delays; bottlenecks)	Medium	Low	Medium	Low	Not suitable (conventional automation)	Needs process redesign/integration before AI

Table 3: Combined pain-point and task-level AI suitability assessment

Dimension	Key question to answer	Examples of evaluation criteria
Strategic alignment	To what extent does this opportunity support core business objectives?	Contribution to revenue, efficiency, competitiveness, or strategic goals
Organisational support	Is there sufficient ownership and willingness to adopt this initiative?	Leadership commitment, stakeholder buy-in, change readiness
Expected success	Can the initiative deliver clear and measurable value?	Clarity of outcomes, ability to define KPIs, likelihood of results
Deliverability	Can it be implemented under current constraints?	Effort, complexity, integration needs, time to implement

Table 4: Guide for prioritising AI automation opportunities

Phase 3: AI solution design and implementation

Phase 3 translates prioritised opportunities into bounded, pilot-based solutions, validating feasibility before broader deployment. Use case specification defines each opportunity's business problem, process scope, target task or decision point, intended AI role, and success criteria, remaining technology-agnostic. Prerequisite validation acts as a feasibility gate on data, process stability, technical feasibility, and ownership. Pilot development and deployment implements use cases as prototypes or proofs-of-concept within existing workflows, favouring low-code, spreadsheet-compatible tools and human-in-the-loop configurations, with pilot evaluation judging usability, organisational fit, and decision-support value. In the case, a simple analytical proof-of-concept improved information structure, accessibility, and decision confidence, while revealing limitations such as manual data preparation that informed refinement.

Phase 4: Implementation planning and organisational embedding

Phase 4 marks the transition from experimentation to structured preparation for integration, translating pilot insights into realistic, constraint-grounded decisions. The definition of target-state processes specifies how validated AI interventions are embedded in workflows, clarifying task allocation between AI and humans and accountability. The identification of data, integration, and governance requirements documents data inputs, system interactions, and proportionate governance (ownership, accountability, the role of AI, access rights, and output validation). Change management and capability development provides training suited to SME constraints, while the phased roadmap (Table 5) sequences embedding from preparation to scaling, with dependencies, ownership, and decision gates.

Stage	Timeframe	Focus	Key actions	Decision gate
Stage 1	Month 1	Preparation	Data consolidation; clarify data ownership; confirm governance structures	Target-state conditions validated
Stage 2	Months 2 to 3	Initial embedding	Stable use of AI-supported analysis within existing decision routines	Usage quality and decision-support value confirmed
Stage 3	Month 4	Stabilisation	Monitor usage; refine outputs; clarify interpretation guidelines	Readiness for controlled extension assessed
Stage 4	Month 5	Controlled extension	Extend insights to additional roles under defined governance	Governance approval for expanded access

Table 5: Phased implementation and adoption roadmap (illustrative)

Phase 5: Deployment, evaluation, and continuous improvement

Phase 5 puts AI-enabled solutions into real use and sustains their value through monitoring, learning, and gradual improvement, treating deployment as the start of a learning process. Controlled deployment introduces solutions gradually within the roadmap scope, with minimal disruption and early stabilisation. Monitoring and evaluation assess whether solutions perform as intended and are used appropriately, through lightweight methods such as usage logs and managerial observation rather than complex KPI systems. Collection and analysis of user feedback captures how users interpret AI outputs and perceive usefulness, limitations, and trust. Refinement, scaling, and continuous improvement adjusts solutions on the evidence, treating scaling as conditional on demonstrated stability and readiness, and legitimising staying at pilot scale or pausing. Because the case did not reach live deployment, Phase 5 was evaluated through expert feedback, which confirmed its learning- and governance-oriented design and suggested clearer decision checkpoints.

Conclusions

Theoretical contributions

This study contributes to research on digital transformation and AI adoption in SMEs by shifting the analytical focus from the determinants of adoption to its process. Whereas TOE and DOI explain why adoption occurs, this study develops and evaluates a prescriptive, process-oriented artefact, the AI Adoption Framework for SMEs, that specifies how resource-constrained SMEs can progress from readiness assessment to implementation and continuous improvement (RQ1 and RQ2). In doing so, it addresses the gap between explanation and execution identified in the literature and conceptualises AI adoption as a staged, learning-driven progression rather than a single decision (Hussain and Rizwan, 2024; vom Brocke et al., 2020).

A central contribution concerns the reconceptualisation of organisational readiness. Rather than treating readiness as a fixed label produced by a one-time diagnosis, the framework frames it as a dynamic, observable construct that organisations can assess and act upon across organisational, technical, data, and human dimensions (RQ1). This makes readiness measurable and decision-relevant, translating a general notion into concrete, feasibility-defining constraints that guide subsequent phases.

The framework also contributes a structured account of how SMEs can move from readiness to a prioritised set of automation opportunities (RQ1) and how they can design, pilot, and evaluate AI solutions under uncertainty (RQ2). By separating organisational feasibility (Phase 1) from process-level suitability (Phase 2), the framework reduces a common weakness in both academic and practitioner approaches, selecting use cases because a technology is available rather than because a process genuinely warrants it. Treating implementation planning and organisational embedding as a distinct phase (RQ2) further extends existing frameworks, which often assume a linear transition from pilot success to full deployment and leave embedding underdeveloped (Oludapo et al., 2024). Relatedly, the framework foregrounds augmentation over full automation: by emphasising configurations that keep a human in the loop, together with decision support, it conceptualises AI in SMEs as a collaborative capability that complements rather than replaces human judgement (Mikalef et al., 2019; Mollick, 2024).

Methodologically, the study demonstrates how DSR principles can be applied in an SME digital-transformation context, maintaining academic rigour while remaining practically relevant by grounding the artefact in both theory and real organisational conditions. The combination of case-based demonstration and structured expert feedback shows how meaningful evaluation is possible even when full-scale, long-term deployment is not. Positioned against established digital-

transformation models, the framework operationalises transformation primarily at the business-process level, while functioning as an enabling mechanism for longer-term business-model change (Doukidis et al., 2020).

Business implications

The findings have practical implications for several audiences. For SME owners and managers, the framework offers an adoption path that does not presuppose deep technical expertise or large upfront investment; it emphasises that value depends less on selecting advanced tools and more on organisational readiness, process stability, and reliable data. Sequencing investment according to readiness helps managers avoid common and costly mistakes, investing in AI tools before foundational systems are in place, or automating poorly understood processes, and supports evidence-based prioritisation.

For consultants and advisors, the framework provides a repeatable structure for engaging SME clients: explicit phase boundaries, defined outputs, and clear decision points help steer conversations away from technology-led discussions toward business goals and processes, and help set realistic expectations. At the policy level, the findings indicate that access to AI technologies alone is insufficient; realising value in SMEs also requires structured methodologies, capability development, and support for low-risk experimentation.

Limitations

Several limitations should be acknowledged. First, the empirical assessment relies on a single case study, which limits statistical generalisability; although the case is typical of many SMEs, the findings should be read as evidence of feasibility and applicability rather than as broadly representative outcomes. Second, the final phase of the framework was not deployed in a live setting within the study's timeframe; its evaluation rests on structured expert feedback rather than longitudinal evidence of sustained use. Third, the framework is deliberately technology-agnostic, which increases transferability across sectors but may require additional technical guidance in organisations with very limited in-house AI and data expertise, a trade-off between general applicability and case-specific depth.

Directions for future research

Future research should apply the framework across multiple sectors and organisational contexts to examine how industry characteristics shape readiness, process fit, prioritisation, and implementation, and to assess its transferability through comparative case studies. Longitudinal studies that follow Phases 4 and 5 over time would provide stronger evidence on post-pilot value realisation, scaling decisions, and organisational learning. Further work could integrate quantitative performance metrics

into the later phases, examine how SMEs should decide between building internal capabilities and sourcing external expertise, and compare the framework directly with established AI-adoption and digital-transformation frameworks.

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CAN ARTIFICIAL INTELLIGENCE SUPPORT MANAGEMENT LEARNING? VALIDATING AN AI-DRIVEN STUDY ASSISTANT IN ENTREPRENEURSHIP EDUCATION

Žemaitis, Eigirdas[1]

[1]ISM University of Management and Economics, Vilnius, Lithuania

Keywords: Artificial Intelligence in Education, AI Study Assistant, Sentiment Analysis, Learning Analytics, Management Education, Exam Preparation

Introduction and Theoretical Background

AI study assistants provide instant explanations, practice questions and iterative feedback that support self-regulated learning, yet their effectiveness needs empirical validation. Research has focused on capabilities or perceptions rather than outcomes, and evidence linking students' experience of AI tools to objective performance is scarce (Zawacki-Richter et al., 2019). The study draws on experiential learning theory, in which experimentation, reflection and feedback drive learning (Kolb, 1984), and on entrepreneurial cognition research emphasising reflective reasoning (Mitchell et al., 2007).

Research Aim

This study evaluates an AI study assistant used for exam preparation in an undergraduate Principles of Management course. It asks how students perceive the assistant, whether perceptions, sentiment and use are associated with exam performance, and whether sentiment analysis of open-ended feedback adds insight beyond a rating item.

Methodology

A quantitative design combines learning analytics with sentiment analysis. All 262 students who used the assistant and completed a post-exam survey (helpfulness rating 1–10, five open-ended questions) were matched to their exam scores (0–10). Comparison groups comprised 65 non-users who completed a parallel survey and 52 students who completed neither. Open-ended responses were scored with the VADER sentiment lexicon (Hutto and Gilbert, 2014) and coded by keyword. Non-parametric tests were used.

Results

Perceptions were strongly positive: mean helpfulness was 8.1 (median 8), 73% rated the tool 8 or above, and 97% wanted similar support in other courses. Free-text sentiment was positive in 94% of responses. Students valued practice questions (71%), explanations of theory (61%) and time savings (29%). Criticism concentrated on technical performance: 53% reported lag or crashes at peak usage, 29% found questions too simple or repetitive and 23% noted inaccuracies.

Critically, the helpfulness rating was unrelated to exam performance ($\rho = 0.05$, $p = 0.38$); performance tertiles gave near-identical ratings (8.0, 8.1, 8.2). Free-text sentiment correlated with exam score ($\rho = 0.24$, $p < 0.001$), but the association vanished once response length was controlled (partial $r = 0.06$, $p = 0.37$); length itself, an engagement proxy, predicted performance ($\rho = 0.35$, $p < 0.001$). Users scored higher than non-users who completed the parallel survey (6.6 versus 6.0, $p = 0.007$, $d = 0.40$), mainly in multiple-choice items; non-respondents scored lowest (5.1). This gradient is consistent with a learning benefit but equally with self-selection; 72% of non-users used general-purpose AI such as ChatGPT instead.

Theoretical and Practical Implications

The findings reveal a perception–performance gap: satisfaction with an AI assistant is not a reliable indicator of learning, consistent with evidence that self-assessed learning weakly reflects actual knowledge (Sitzmann et al., 2010). The apparent signal in free-text sentiment reflected how much students wrote rather than how they felt: engagement, not affect, tracks performance, so evaluations of AI tools should pair feedback analytics with behavioural and performance data. For educators, satisfaction surveys alone cannot evaluate learning outcomes. The findings also offer preliminary evidence that course-specific AI assistance may benefit students beyond general-purpose tools, and highlight three design priorities: reliable infrastructure, adaptive difficulty and semester-long availability.

Limitations and Future Research

The study covers one course and cohort, uses a non-randomised comparison group without controls for prior ability, and relies on a general-purpose sentiment lexicon. Future research should incorporate usage logs and prior grades, and test causal effects through quasi-experimental designs across courses.

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UNDERSTANDING SPONSORSHIP RESPONSE IN EXPATRIATE FAN COMMUNITIES: ANTECEDENTS AND THE MEDIATING ROLE OF PATRIOTISM

Konstantinos Koronios[1]; Lazaros Ntasis [2]; John Douvis[3]; Athanasios Strigkas[4]; Alkis Thrassou[5]; Dimitropoulos, Panagiotis[6]; Andreas Papadopoulos[7]

[1]Department of Sport Organization and Management, University of Peloponnese, Sparti, Greece
[2]Department of Sport Organization and Management, University of Peloponnese, Sparti, Greece.
[3]Department of Sport Organization and Management, University of Peloponnese, Sparti, Greece.
[4]Department of Sport Organization and Management, University of Peloponnese, Sparti, Greece.
[5]Department of Marketing, University of Nicosia, Nicosia, Cyprus
[6]Department of Accounting and Finance, University of Peloponnese, Kalamata, Greece,
[7]Department of Sport Organization and Management, University of Peloponnese, Sparti, Greece.

Keywords*: sponsorship, social media, expatriate fans; patriotism*

Introduction- Aim of Research

As the sports sponsorship industry expands significantly, multinational companies should actively engage with expatriate fans—those who support their national teams while residing abroad (Van Bakel and Salzbrenner, 2019). Nevertheless, the majority of sponsorship studies mostly relies on local audiences, providing little insight into the factors influencing sponsorship responses among these globally dispersed "satellite" supporters. This research formulates and evaluates a model that elucidates expatriate supporters' reactions to a national-team sponsors, using a series of fan- and sponsor-related determinants. This study examines the impact of team attachment and event involvement, alongside perceived sponsor-team congruence, on sponsorship response, while also evaluating the influence of social media usage in modern fan engagement contexts. Moreover, the model identifies patriotism as a moderating variable (Ličen, 2019), indicating that heightened national identity affects the influence of these antecedents on sponsorship response. The research elucidates the direct determinants and the contextual parameters that enhance the efficacy of sponsorship initiatives for expatriate fan groups.

Theoretical Background

Team attachment denotes a fan's lasting psychological and emotional connection to a team, integrating cognitive affiliation and affective commitment cultivated by favorable team-related experiences (David et al., 2020). Based on social identity theory, this connection integrates into the fan's self-concept, influencing positive assessments of entities associated with the in-group (Koronios et al, 2025). In sponsorship contexts, sponsors may be seen as genuine collaborators inside the team's symbolic network, fostering a more favorable sponsorship reaction. Significantly, distance does not inherently diminish connection, making it particularly pertinent for expatriate enthusiasts (Takamatsu, 2021).

Event involvement refers to participants' inclination to engage with an event, shaped by factors such as the environment, overall atmosphere, and the demographic profile of attendees (Sung et al., 2021). Sports marketing research further suggests that greater involvement in sport events fosters favourable behaviours and supports the development of vivid event-related memories, which in turn increases motivation to engage in event-related activities, including interactions with the event's sponsors (Sung et al., 2021).

In sport sponsorship, sponsor–team congruence captures fans' perceived fit between a sponsor and a sponsored team in terms of image, values, mission, or target audience, and it is consistently identified as a key predictor of sponsorship outcomes (Rutter et al., 2020). Drawing on balance theory and associative learning perspectives, congruence supports cognitive consistency and facilitates the transfer of positive team associations to the sponsoring brand, strengthening favourable evaluations (Rutter et al., 2020). Empirically, higher congruence enhances brand recall, favourability, trust, and behavioural intentions, making it a central antecedent of sponsorship response, particularly among expatriate fans who interpret sponsors as part of the team's symbolic identity (Henderson et al., 2019).

For expatriate and non-local supporters, social media usage has become a key channel through which shared sport consumption, fan socialization, and collective belonging are preserved across geographic distance and limited physical proximity (Wakefield and Bennett, 2018). Digital platforms function as virtual gathering spaces that enable real-time interaction, information exchange, and ongoing team-related discussions, helping geographically dispersed fans maintain psychological closeness to their national teams. Beyond fan-to-fan engagement, social media also increases the frequency and immediacy of exposure to sponsor messages embedded in team content and online communities, enabling interactive responses (e.g., commenting, sharing) that can strengthen sponsorship response among expatriate fans.

Within expatriate fandom, patriotism can act as a contextual force that shapes how strongly fans respond to sponsors linked to their national team. Expatriate supporters often follow a team that symbolizes their country of origin while living abroad, positioning their consumption at the intersection of national identity and an international marketplace (Kaplanidou, 2021). In this setting, heightened patriotic pride may make team-related meanings more salient and intensify in-group orientations, thereby strengthening the extent to which key drivers translate into sponsorship response. Accordingly, this study conceptualizes patriotism as a moderating variable that conditions the relationships between aforementioned antecedent and expatriate fans' sponsorship response, capturing when these antecedents become more influential in cross-national contexts.

Based on the literature, the following model and hypotheses are proposed:

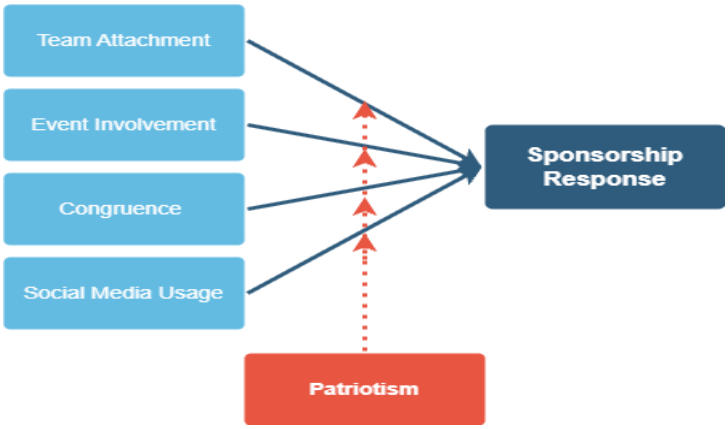


Figure 1. Proposed model

Hypotheses:

H_1: Expatriate fans' attachment to a national basketball team is expected to affect their response to sponsorship

H_2: Expatriate fans' involvement with the event is expected to affect their response to sponsorship

H3: Perceived sponsor–team congruence is expected to affect expatriate fans' response to sponsorship

H_4: Expatriate fans' social media usage is expected to affect their response to sponsorship

$H_{5\text{-}8}$: Expatriate fans' patriotism moderates the relationships (a) team attachment, (b) event involvement, (c) sponsor–team congruence, (d) social media usage and expatriate fans' response to sponsorship

Methodology

A quantitative research design was employed for the purposes of this study. Data were collected through an online questionnaire administered to Greek expatriate fans supporting the Greek national basketball team during the EuroBasket 2025 tournament. A total of 1,238 valid responses were obtained and subsequently analyzed using SPSS and AMOS to test the proposed conceptual model and hypotheses.

Results and Discussion

The proposed relationships among the constructs were examined through Structural Equation Modeling (SEM). Initially, Exploratory Factor Analysis (EFA) confirmed satisfactory construct validity, with Kaiser–Meyer–Olkin (KMO) values exceeding 0.80 for all measurement scales, indicating strong sampling adequacy and suitability for hypothesis testing. The extracted factors explained between 31.9% and 91.2% of the total variance across the six variables, demonstrating considerable explanatory capacity. Subsequently, Confirmatory Factor Analysis (CFA) supported the robustness of the measurement model, as reflected by favorable fit indices. Specifically, normed chi-square (χ^2/df) values were below 1, the Root Mean Square Error of Approximation (RMSEA) remained under 0.10, the Normed Fit Index (NFI) consistently exceeded 0.95, and the Comparative Fit Index (CFI) was above 0.90 across all constructs. These indicators collectively suggest an acceptable model fit. A strong positive correlation (r = 0.817) emerged between the mediator Patriotism and Sponsorship Response, while correlations among other variables ranged from 0.401 to 0.697. Overall, SEM findings provided substantial empirical support for hypotheses H_1–H_8, strengthening the study's theoretical framework.

Table 1: Structural Equation Model Weights

Affect			b	p	Result
Direct Effects					
H1: Team Attachment	→	Sponshorship Response	0.551	<.001	S
H2: Event Involvement	→	Sponshorship Response	0.654	<.001	S
H3: Congruence	→	Sponshorship Response	0.715	<.001	S
H4: Social Media Use	→	Sponshorship Response	0.518	<.001	S
Indirect Effects (Mediated by Patriotism)					
H5: Patriotism mediates Team Attachment	→	Sponshorship Response	0.705	<.001	S
H6: Patriotism mediates Event Involvement	→	Sponshorship Response	0.742	<.001	S

H7: Patriotism mediates Congruence	→	Sponshorship Response	0.889	<.001	S
H8: Patriotism mediates Social Media Usage	→	Sponshorship Response	0.771	<.001	S

S=Supported, R=Rejected, SE=Standard Error, NNFI = .982; CFI = .981; SRMR = .024; RMSEA = .085

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FROM SHORT-TERM GAINS TO SUSTAINABLE LEGACY: THE NEW APPROACH OF OLYMPIC GAMES

Nicoliello, Mario [1] Zampatti, Davide [1]

[1] Department of Economics and Management, University of Brescia, Italy

Keywords: Olympic legacy; mega-events; Summer Olympic Games; Winter Olympic Games; systematic literature review; sustainability; urban development

Introduction

Since the 1990s, legacy has been a formal requirement in the IOC host city selection process. Despite this, it remains contested: frequently used to justify large public spending without independent verification (Tomlinson, 2014). Research has expanded since 2008, but there is still no shared definition or measurement standard (Scheu et al., 2019).

Purpose, Aim and Objectives

This paper applies Preuss's multidimensional framework to seven host cities: Rio 2016, Tokyo 2020, and Paris 2024 for Summer Games; Vancouver 2010, Sochi 2014, PyeongChang 2018, and Beijing 2022 for Winter Games. The study asks: How is legacy defined and measured within this framework? What outcomes emerge across editions? How do results vary across contexts?

Literature Review and Theoretical Framework

Preuss (2007) defined legacy as planned and unplanned, positive and negative, tangible and intangible structures created for and by a sport event that remain longer than the event itself. Gratton and Preuss (2008) organised the framework across six dimensions: economy, infrastructure, society, environment, sport, and governance, arguing that outcomes must be actively planned before the event. Preuss (2018) formalised this into a measurement model requiring longitudinal data and counterfactual baselines. Key complementary work includes Leopkey and Parent (2012) on multi-actor governance, Gold and Gold (2021) on the convergence of legacy and sustainability in IOC policy, and Chen and Henry (2019) on the weakness of causal evidence.

Methodology

The study follows PRISMA guidelines. Sources were retrieved from Scopus, Web of Science, SPORTDiscus, Google Scholar, and Taylor and Francis Online. The search covered peer-reviewed

articles, book chapters, and conference papers from 2000 to 2024 in English. From approximately 500 records, 112 were assessed. The final sample is 55 sources, synthesised thematically using Preuss's six dimensions.

Main Findings and Contribution

Four findings emerge. First, Preuss's framework remains the most complete tool for studying Olympic legacy. Second, a gap between objectives and outcomes appears in every case, widest in Rio 2016, Sochi 2014, and PyeongChang 2018. Third, signs of improvement appear over time in venue planning and environmental strategies, but core constraints remain: cost pressure and unequal distribution of benefits. Fourth, Winter Games form a structurally distinct case. Remote locations and specialised facilities produce an infrastructure legacy paradox: the most expensive venues tend to have the least long-term local use (Leopkey and Parent, 2016). None of the four Winter editions examined resolved this fully.

Originality and Value

This is one of the few studies to apply Preuss's framework consistently across both Summer and Winter Games in a single review, introducing the infrastructure legacy paradox as a structural feature of Winter editions.

Research Limitations

Paris 2024 analysis relies on pre-Games data. English-language sources may exclude relevant work in Portuguese and Japanese or other local languages. Long-term studies covering 10 to 20 years post-event remain rare.

Theoretical and Practical Implications

Four priorities follow for future hosts: plan legacy early within wider urban strategies; keep monitoring independent beyond the Games; involve local communities where displacement risks exist; align expectations with what mega-events can realistically deliver.

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THEORISING AI-DRIVEN FAN ENGAGEMENT IN MEGA-EVENTS: INTEGRATING BEHAVIOURAL AND EMOTIONAL DIMENSIONS

Korellis, Georgios[1]; Yiapanas, George[1]; Markatos, Georgios[2]

[1]Department of Management, University of Nicosia, Nicosia, Cyprus

[2]Global College, Nicosia, Cyprus

Keywords: Artificial intelligence, Fan engagement, Mega-events, Olympic Games, Consumer engagement marketing, Personalisation, Gamification, Community building

Introduction

Artificial intelligence (AI) is increasingly embedded in sport mega-events, yet the mechanisms through which AI-enabled applications may shape fan engagement remain under-theorised. This matters in the Olympic Games, where globally dispersed audiences navigate dense information within compressed event windows and depend on digital platforms (Müller, 2015).

Purpose, Aim and Objectives

This study develops a conceptual framework explaining how AI-enabled mechanisms may stimulate fans' voluntary contributions and engagement outcomes in sport mega-events. Using the Paris 2024 Olympic Games as an illustrative documentary case, the study identifies AI applications, theorises five engagement mechanisms, distinguishes consumer-to-brand from consumer-to-consumer contributions, and derives propositions for empirical testing

Literature Review and Theoretical Framework

Consumer engagement marketing conceptualises engagement as voluntary, value-creating contributions stimulated by deliberate organisational initiatives (Harmeling et al., 2017; Cheung et al., 2024), while sport research frames fan engagement as extra-role behaviour and emotionally charged participation (Yoshida et al., 2014; Shuv-Ami et al., 2020). However, these frameworks largely emerged when technology functioned mainly as a communication or distribution channel and offer limited explanation of how adaptive AI systems shape exposure, interaction and participation. This gap is amplified in time-bounded, globally dispersed and platform-mediated mega-events. Building on AI-mediated engagement research (Perez-Vega et al., 2021), the framework theorises AI as a constitutive mediator linking five AI-enabled mechanisms to fans' voluntary contributions and engagement outcomes.

Methodology and Methods

A three-stage conceptual theory-building design was adopted. A structured literature synthesis established the theoretical anchors and then engagement-marketing dimensions were mapped deductively to AI capability families and consolidated into five mechanisms. Finally, publicly available Paris 2024 materials from Olympic organisations and technology partners were purposively analysed and coded by capability, mechanism, voluntary contribution type and reported engagement-related outcome.

Findings and Contribution

The analysis identifies five AI-enabled mechanisms: personalisation, interactive participation, immersive experiences, gamification and community building. Paris 2024 most clearly operationalised personalisation and interactive participation. The other mechanisms appeared more contingent on design, data governance and moderation. Together, they explain how AI may reduce discovery friction, enable responsive exchange, intensify mediated presence, encourage repeated participation and support social connection, linking organisational initiatives to consumer-to-brand and consumer-to-consumer voluntary contributions.

Originality and Value

The study moves beyond generic claims that AI improves engagement by specifying mechanism-level pathways under mega-event conditions. It integrates behavioural and emotional dimensions of sport engagement with AI-enabled mediation and generates propositions for testing across future Olympic Games and other mega-events.

Research Limitations

The framework is conceptual and relies on one illustrative mega-event and public organisational and partner documents. Without comparison data showing what engagement would have looked like in the absence of these AI-enabled features, the proposed relationships represent theoretically grounded pathways rather than validated causal effects.

Theoretical and Practical Applications and Implications

The framework extends consumer engagement marketing by explaining how AI configures exposure, interaction and social connection in mega-events. Organising committees should align AI investments with explicit engagement objectives and assess mechanism-specific outcomes. Personalisation and interactive participation appear most operationally mature,

while immersive, gamified and community initiatives require stronger coordination across technology, rights, privacy, safeguarding and moderation.

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ESG, TRANSPARENCY AND ACCESSIBILITY IN EUROPEAN FOOTBALL: A SYSTEMIC APPROACH TO THE EVALUATION OF CLUBS

Stefanizzi, Pasquale[1]; Cretì, Chiara[2]; Cavallo, Federica[1]; Maizza, Amedeo[2]

[1]Department of Management and Economics, Pegaso Telematic University, Naples, Italy

[2]Department of Economics, University of Salento, Lecce, Italy

Keywords: ESG disclosure, Non-financial reporting, Professional football, Information accessibility, Comparative analysis, Sustainability in sport, Governance, Transparency.

Introduction

ESG criteria are entering sports management under growing regulatory and societal pressure for accountable behaviour. Given their economic and social relevance, European football clubs are increasingly expected to align governance, environmental practices and social responsibility with international standards such as UEFA's sustainability strategy (UEFA, 2021) and the UN 2030 Agenda (United Nations General Assembly, 2015).

Purpose, Aim and Objectives

The study assesses ESG maturity in the major European leagues, examining not only whether non-financial information is disclosed but also how accessible it is to stakeholders. It asks how much ESG content clubs publish online, how visible and accessible it is, and what differences in transparency emerge across the six leagues.

Literature Review and Theoretical Framework

Sustainability in sport has largely been examined through CSR-based models emphasising stakeholder engagement and reputation (Ráthonyi-Ódor et al., 2020; Fernández-Villarino, 2021; Metelski, 2024), while institutional pressures increasingly shape practices through licensing requirements (Adam et al., 2025) and external benchmarking (Global Sustainability Benchmark in Sports, 2024). Systemic contributions instead frame football as an ecosystem of interacting clubs, governing bodies, sponsors and communities (Yiapanas et al., 2024). Transparency, however, is typically measured as disclosure volume, leaving stakeholder access underexplored.

Methodology and Methods

The sample comprises 114 clubs in the top divisions of six European leagues (England, Germany, Italy, Spain, France, Portugal) in 2024/2025. A structured content analysis of official websites examined three disclosure dimensions: general ESG information, codes of ethics or equivalent documents, and sustainability reports. Availability and placement were scored 0–3 and operational accessibility 0–2, producing a composite indicator from 0 to 15. Inter-rater reliability across three coders ranged between 0.75 and 0.85 (Jakobsson and Westergren, 2005). Standardised quality and accessibility scores segmented clubs into four profiles via cluster analysis.

Findings and Contribution

Results reveal marked heterogeneity across and within leagues. The Silent profile, combining limited content with poor accessibility, prevails everywhere, especially in the Primeira Liga and Serie A. Leader clubs, pairing structured disclosure with rapid access, concentrate in the Premier League and Bundesliga. Formal-but-hidden clubs publish rich documentation that is hard to retrieve, whereas Light communicators offer easy access to thin content, indicating a systematic gap between disclosure and effective stakeholder usability (Iazzi et al., 2025).

Originality and Value

The study treats informational accessibility as a constitutive dimension of ESG maturity rather than a secondary attribute of disclosure. Distinguishing content quality from digital usability, it offers a replicable framework reframing transparency as both disclosure and access.

Research Limitations

The analysis covers only public online information and may underestimate practices implemented but not disclosed. Residual interpretative subjectivity cannot be excluded despite cross-validation among independent coders, and the cross-sectional design does not assess the impact of disclosure on financial or sporting performance.

Theoretical and Practical Applications and Implications

Theoretically, the study separates informational substance from usability. Practically, implications differ by profile: Leaders should preserve continuity; Formal-but-hidden clubs

should simplify website architecture; Light communicators should deepen content; and Silent clubs should establish a basic, visible disclosure structure.

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GREEN AND DIGITAL SKILL BUNDLES IN THE CONVERGENCE OF AGRIFOOD, MARKETING AND ICT: MARKETING AS A COORDINATION MECHANISM BETWEEN JOB ADS AND EU POLICY DOCUMENTS

Stergiou, Anastasia[1]; Papadopoulos, Ioannis[1]; Georgiou, Konstantinos[2]; Angelis, Lefteris[2]

[1]Department of Forestry, Wood Sciences and Design, School of Technology, University of Thessaly, Karditsa, Greece

[2]School of Informatics, Aristotle University of Thessaloniki, Thessaloniki, Greece

Keywords: Green skills, Digital skills, Agrifood sector, Marketing and branding, Online job advertisements, Policy documents, NLP, Skill profiles

Introduction

The twin green and digital transition is reshaping how agrifood firms create, document and communicate value. Sustainability increasingly affects differentiation, reputation and consumer trust, while digital traceability, analytics and information systems expand the evidence available to firms. These changes broaden skill requirements beyond narrowly specialised roles and increase demand for combinations of agrifood knowledge, market-facing capabilities and digital competence. Online job advertisements offer a dynamic view of employer demand, whereas European frameworks such as GreenComp, DigComp and ESCO provide institutional reference points for sustainability, digital competences and occupational skills (Bianchi et al., 2022; Vuorikari et al., 2022; Chiarello et al., 2021).

Purpose, Aim and Objectives

This study examines two questions: which recurring skill profiles appear at the convergence of agrifood, marketing and digital technologies, and how closely these profiles align with skills emphasised in European Union policy documents. It also evaluates whether marketing functions as a coordination mechanism linking sustainability evidence, digital capability and market-facing activity.

Methodology and Methods

Using data from the European SKILLAB project, the analysis compares 1,041 online job advertisements with 392 EU policy documents. Skills were cleaned and standardised,

represented through binary features and weighted using TF-IDF. Job profiles were grouped with the BIRCH algorithm into eight skills-based clusters. In parallel, each advertisement was scored on agrifood, marketing and digital/IT axes; scores were normalised to sum to 1 and a 0.25 threshold was used to distinguish primary, dual and triple convergence. Policy documents were grouped into three thematic clusters, and market-policy alignment was assessed using cosine similarity between weighted skill-profile prototypes (Zhang et al., 1996).

Findings and Contribution

Marketing was the largest average axis across all eight job clusters, although the balance among domains varied. Digital Transformation showed the highest digital share (44.5%), while Agrifood Core and Agrifood-Market Interface showed the highest agrifood shares (36.6% and 32.8%). Dual convergence dominated most clusters, reaching 93.7% in Digital Transformation, whereas triple convergence was concentrated in smaller profiles, including Agrifood Core (41.4%) and Circular/Resource Sustainability (36.6%). Policy-market alignment was measurable but uneven. The strongest cosine similarity was 0.26 between Digital Transformation and Green Governance and Circular Economy, followed by 0.21 for Circular/Resource Sustainability with the same policy cluster. The results reveal multiple hybrid profiles rather than one standard green-digital occupation.

Originality and Value

The study combines labour-market and policy evidence in a common skill space and adds an interpretable three-axis framework for identifying hybridisation. The findings support the interpretation of marketing as a coordination mechanism connecting operational evidence, digital information and customer-facing value rather than only as a communication function.

Research Limitations

The analysis depends on skills extracted from job advertisements and policy documents and on deliberately focused axis vocabularies. Online vacancies do not represent the entire labour market, and part of the observed divergence may reflect differences in text genre and level of abstraction rather than substantive policy gaps.

Theoretical and Practical Applications and Implications

The results suggest that stable competence frameworks should be complemented by dynamic labour-market intelligence. Educational programmes can integrate green, digital and marketing capabilities in applied pathways, while firms can use the identified profiles for

workforce planning and cross-functional role design. Future research could use longitudinal data, embedding-based matching and stronger ESCO normalisation to test how these profiles evolve over time.

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ALGORITHMIC AUTHORITY AS STRATEGIC INFORMATION INFRASTRUCTURE

Sabag-Ben Porat, Chen[1]; Kol, Ofrit[1]; Zimand-Sheiner, Dorit[1]; Levy, Shalom[2]

[1] The Moskowitz School of Communication, Ariel University, Ariel, Israel

[2] The Department of Economics and Business Administration, Ariel University, Ariel, Israel

Keywords: Public Relations, Algorithmic Authority, Generative AI, Trust, Knowledge Sources, FinTech, Earned Media

Abstract

Introduction and Background

Over the past decade, public relations has been increasingly sidelined in favor of advertising, paid promotion, and search engine optimization strategies that focus on visibility and clicks. In this environment, PR has often been framed as a supplementary reputational activity rather than a core mechanism for shaping public knowledge. The rapid rise of generative artificial intelligence and large language model-based search systems marks a fundamental shift. Users are no longer primarily exposed to ranked lists of links, but to synthesized answers presented as authoritative knowledge. In this context, public relations returns to its historical core function: mediating knowledge, building trust, and shaping which actors are recognized as legitimate sources of information. The key question is no longer how brands are framed, but who is selected to appear in AI-generated answers, and which knowledge sources underpin that selection.

Purpose, Aim, and Research Question

The purpose of this study is to examine how trust-based public relations practices shape algorithmic authority in generative AI systems, with a focus on epistemic selection processes. Rather than focusing solely on branding or message framing, the study investigates which organizations are included or excluded from AI-generated answers and which types of sources generative systems rely on when constructing authoritative

responses. The central research question is: What are the determinants of algorithmic authority in public relations, and how do PR-based trust-building practices influence the selection of brands and knowledge sources in generative AI outputs?

Literature Review and Theoretical Framework

The study builds on public relations scholarship that conceptualizes PR as a mechanism for building legitimacy, trust, and epistemic authority rather than merely managing visibility. Recent research highlights how artificial intelligence is increasingly embedded in communication management, reshaping how organizations establish credibility and public relevance (Zerfass et al., 2020; Cusnir, 2024). To account for the role of generative AI, the study integrates research on algorithmic gatekeeping, emphasizing how automated systems perform institutional functions traditionally associated with human intermediaries (Napoli, 2014). Research on responsible innovation in AI further underscores the importance of legitimacy, accountability, and deliberation in AI-mediated decision-making (Buhmann & Fieseler, 2021). Framing theory within public relations explains how organizations are positioned as credible or authoritative through sustained interpretive patterns rather than isolated messages (Hallahan, 1999).

Methodology and Methods

The study proposes a novel methodological approach based on the development of a dedicated algorithm designed to systematically analyze the outputs of generative AI. The algorithm performs multiple standardized queries runs across leading generative AI systems using identical prompts related to trust, expertise, and comparative evaluation within the FinTech domain. For each run, the system captures the full AI-generated response, identifies the included organizations, assesses their relative prominence, extracts and maps the knowledge sources underlying the AI-generated information, and identifies referenced or implied source types. Repeated iterations enable the assessment of stability and variation in source selection. The empirical focus on FinTech reflects the sector’s reliance on trust, regulatory legitimacy, and third-party validation.

Main and Expected Findings and Contribution

The study is expected to demonstrate that algorithmic authority is closely associated with trust-based public relations practices rather than promotional visibility. Organizations supported by high-quality earned media, expert-oriented content, and consistent entity representation are expected to be more frequently included and more prominently positioned in AI-generated answers. Organizations relying primarily on advertising or owned media are expected to be excluded or framed with greater caution.

Originality and Value

The study contributes a novel conceptualization of algorithmic authority as an epistemic outcome of public relations practices and introduces a repeatable computational method for analyzing AI-based knowledge selection.

Research Limitations

The analysis is based on observable AI outputs and inferred source signals rather than direct access to proprietary model architectures and therefore captures algorithmic selection as it manifests externally rather than its internal logic.

Theoretical and Practical Implications

Theoretically, the study brings public relations back to the center of scholarly debate by positioning the field as a key factor in the governance of algorithmic knowledge and the construction of authority in the age of artificial intelligence. Practically, it offers public relations professionals a new framework for evaluating success in AI-mediated information environments, where influence is no longer measured by exposure or clicks, but by inclusion and perceived authority within AI-generated answers.

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FROM SUSTAINABILITY TO BRAND POSITIVITY IN LUXURY INDUSTRY: THE MEDIATING ROLES OF SELF-CONGRUENCE AND BRAND ENGAGEMENT

Dekoulou Paraskevi[1], Kyriakos Riskos[2], Ioanna Papasolomou[3]

[1]School of Journalism and Mass Communications, Faculty of Social and Economic Science, Aristotle University of Thessaloniki, Thessaloniki, Greece

[2]Department of Media and Communication, Erasmus School of History, Culture and Communication, Erasmus University Rotterdam, Rotterdam, Netherlands

[3]Department of Management, School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Sustainable Marketing Activities, Self-Congruence, Brand Engagement, Brand Positivity, Consumer Behavior, Sustainability, Branding

Despite the growing emphasis on sustainability as a central pillar of long-term organizational growth, the luxury industry is often perceived as less responsive to concerns surrounding environmental impact, human rights, and animal welfare (Dekhili et al., 2019). However, due to the greater feasibility and resources that luxury companies have, consumers expect luxury brands to act responsibly (Janssen et al., 2019; Kwon et al., 2024). In response, the integration of sustainability into luxury branding has emerged as a strategic imperative, as luxury brands increasingly strive to align exclusivity and symbolic meaning with principles of responsible business conduct (Kim et al., 2022). This tension reflects a central paradox within the luxury industry. Luxury is traditionally associated with rarity, prestige, and exclusivity, attributes that often conflict with sustainability principles such as accessibility and efficient resource use. This paradox may, in turn, influence luxury consumers' willingness to purchase sustainable luxury brands (Vergura et al., 2023).

Empirical research on the relationship between luxury and sustainability has produced inconsistent findings and remains relatively limited, (Eastman et al., 2024), as sustainability research has largely concentrated on mass-market and mid-market brands, leaving luxury contexts underexplored (Broccardo et al., 2023). To address this gap, this research explores how sustainable marketing activities (SMAs) implemented by luxury brands influence consumer behavior in Greece. Unlike previous studies, the present research offers a more nuanced perspective by

investigating how each of the four dimensions of SMAs, environmental, economic, social, and cultural, affects consumer outcomes in the context of luxury brands. More specifically, this study examines the effects of perceived SMAs on consumers' actual and ideal self-congruence, as well as the influence of these two forms of self-congruence on cognitive, emotional, and behavioral brand engagement. It further investigates the impact of these engagement dimensions on brand positivity, conceptualized as an overall favorable evaluative orientation toward the brand that encompasses affective, cognitive, and behavioral tendencies beyond mere positive word-of-mouth or advocacy (Wilk et al., 2020).

Drawing on self-congruity theory, the study argues that alignment between brands and consumers' actual and ideal self-concepts fosters favorable consumer responses by strengthening identity-brand fit (Ivanauskaitė et al., 2025). Complementing this perspective, social identity theory suggests that brands act as symbolic references for consumers' self-concept. When a brand resonates with consumers' identity, it fosters a deeper psychological connection that promotes engagement with the brand through cognitive processing, emotional attachment, and behavioral involvement, ultimately leading to positive brand-related outcomes (Zhang et al., 2020).

Methodologically, the study adopts a quantitative approach based on survey data from 323 consumers familiar with luxury brands that communicate sustainable marketing initiatives in the Greek market, collected through both online and offline procedures. Established and validated measurement scales are adapted for the study's context, and the hypothesized relationships are empirically tested using structural equation modeling (SEM).

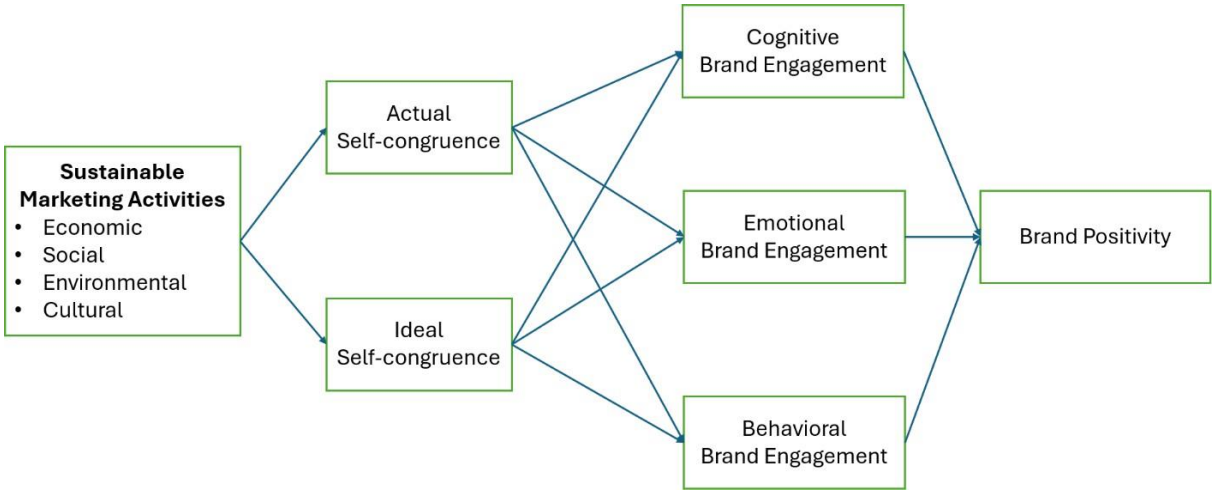


Figure I: The Conceptual Model

The findings indicate that SMAs exert differentiated effects on actual and ideal self-congruence. Specifically, the economic, social and cultural dimensions of sustainability positively influence both forms of self-congruence, whereas the environmental dimension does not exhibit a significant effect, possibly reflecting a misalignment between environmental sustainability and the symbolic and status-oriented nature of luxury consumption (Mancusi et al., 2025). These findings further highlight the relevance of cultural sustainability in the luxury context, where heritage, craftsmanship, and symbolic value are core elements of brand identity (Reddy et al., 2026). The results also reveal distinct pathways through which self-congruence shapes brand engagement. Actual self-congruence significantly strengthens cognitive and behavioral engagement, but not emotional engagement, suggesting that alignment with consumers' current self-concept primarily encourages cognitive processing and active participation. In contrast, ideal self-congruence has a strong positive impact on emotional engagement and also enhances cognitive engagement, underscoring the importance of aspirational identity alignment in cultivating emotional attachment to the brand. All three dimensions of brand engagement positively and significantly influence brand positivity, with emotional engagement emerging as the most influential predictor.

The findings contribute to the growing sustainability literature by addressing the persistent paradox between sustainability and luxury consumption, demonstrating that sustainability can positively shape consumer perceptions when it aligns with consumers' identity. By adopting a multidimensional approach, the study demonstrates that sustainability should not be treated as a

uniform construct in the luxury context and extends existing frameworks by incorporating the cultural dimension. From a managerial perspective, the results suggest that luxury brands should emphasize culturally and socially embedded sustainability initiatives, such as heritage preservation and responsible sourcing, to strengthen consumer-brand connections. Moreover, the study proposes a three-path mediation model linking sustainable marketing activities to brand positivity through self-congruence and multidimensional brand engagement, while offering managerial implications and directions for future research. Finally, the study acknowledges limitations related to the use of self-reported and cross-sectional data, which may affect causal inference and generalizability.

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CAN CONSUMERS DETECT GREENWASHING? THE ROLE OF ENVIRONMENTAL KNOWLEDGE IN BRAND TRUST

Gadeikiene, Agne[1]; Dobilaite, Audra[1,2]

[1]School of Economics and Business, Kaunas University of Technology, Kaunas, Lithuania

[2]UAB Baltic Transline, Kaunas, Lithuania

Keywords: Sustainable Consumption, Greenwashing, Environmental Knowledge, Brand Trust

Introduction

Growing concern about sustainability and environmental issues increasingly motivate consumers to search for greener products (e.g., Timmons et al., 2024). Brands have responded to this rising demand by expanding green product offerings and promoting them as environmentally friendly. To attract green consumers, brands often use green claims. Even though they sound environmentally friendly but often are vague, misleading, or even false (Correa et al., 2017). This practice, commonly referred to as greenwashing, has become a significant challenge in the context of sustainable consumption, as misleading environmental claims can distort consumer perceptions and complicate the development of trust in brands. In this context, it is essential to understand how consumers interpret such claims and whether their environmental knowledge enables them to distinguish between honest green practices, honest non-green practices, and greenwashing.

The main aim is to determine whether higher levels of environmental knowledge improve consumers' ability to identify greenwashing and how these perceptions influence trust in brands. The study focuses on three product conditions: an honest green product, an honest non-green product, and a product applying greenwashing practices.

Theoretical Background

Green marketing and Greenwashing literature suggest that misleading environmental claims can negatively affect consumer trust (Chen et al., 2019). Prior research indicates that consumers with higher environmental knowledge may be better equipped to recognize greenwashing; however, findings remain inconsistent and context-dependent (Isac et al., 2024). Other studies emphasize the role of emotional marketing cues, such as nature imagery and green colours, which can reduce critical thinking even among knowledgeable consumers (Schmuck et al., 2018). Furthermore, limited consumer awareness of misleading environmental claims has been identified as a barrier to effective greenwashing detection (Timmons et al., 2024).

Methodology and Methods

The empirical study adopts a quantitative survey-based design. 415 respondents from Lithuania were exposed to products representing three conditions – an honest green product, an honest non-green product, and a product applying greenwashing – and were asked to evaluate perceived greenwashing and brand trust. Cosmetic product packaging was specifically designed for this study to reflect each of these three conditions.

Findings

The findings reveal that higher level of consumers' environmental knowledge does not universally lead to better recognition of greenwashing. Knowledge effects were dependent on product condition: knowledgeable consumers most accurately evaluated the honest green product, while no statistically significant differences were found in the greenwashing condition. This suggests that emotional and visual cues may weaken the ability to detect misleading claims. Additionally, although the greenwashing brand was perceived as applying the most greenwashing, trust in this brand was not the lowest. Contrary to earlier studies (e.g., Isac et al., 2024), perceived greenwashing did not necessarily reduce brand trust, possibly due to the use of unfamiliar brands and the absence of prior consumer-brand relationships.

Contribution and Limitations

This research addresses an important gap by examining how environmental knowledge, perceived greenwashing, and brand trust interact within different product conditions, contributing to the broader discussion on sustainable marketing and consumer decision-making. Overall, the findings contribute to green marketing research stream by demonstrating that environmental knowledge alone is insufficient for consistent greenwashing detection. Practically, the results underline the need for improved consumer education to increase of consumer eco-literacy and more transparent green marketing practices to support informed and sustainable consumption.

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THE PERSUASIVENESS OF EWOM: MESSAGE AND SENDER EFFECTS ON BRAND CREDIBILITY AND REPUTATION

Hopeniene, Rimante[1]; Salciuviene, Laura[2]

[1]School of Economics and Business, Kaunas University of Technology, Kaunas, Lithuania

[2]Birmingham Business School, University of Birmingham, Birmingham, United Kingdom

Keywords: eWOM Persuasiveness, Sender Credibility, Brand Credibility, Brand Reputation,

Introduction

Prior eWOM research has largely focused on consumer responses, while brand-level outcomes remain under-theorised and brand credibility and reputation are often examined separately (Liu et al., 2024; Chiu et al., 2025). Emerging evidence further suggests that eWOM effects vary depending on how communication cues are interpreted within online communities (Chiu et al., 2025). This creates a need to better understand how eWOM persuasiveness shapes brand-level evaluations.

Purpose, Aim and Objectives

This study examines how eWOM persuasiveness, shaped by message characteristics and sender credibility, influences brand credibility and reputation across comparable brands within the same online community. The study further investigates whether identical message and sender cues may produce divergent brand evaluations.

Literature Review and Theoretical Framework

Drawing on the Persuasion Knowledge Model (Friestad and Wright, 1994; Rahmani, 2023), the study conceptualises eWOM persuasiveness as a mechanism linking communication cues to brand credibility and reputation. Recent research further highlights the socially embedded nature of eWOM environments shaped by user interaction (Liu et al., 2024). Based on the Persuasion Knowledge Model and prior eWOM research, hypotheses were formulated linking message and sender cues to eWOM persuasiveness and subsequent brand-level outcomes. This perspective is particularly relevant in anonymous online communities, where consumers continuously evaluate the credibility and persuasiveness of communication cues.

Methodology and Methods

A non-experimental cross-sectional survey was conducted among Lithuanian consumers (n = 419) exposed to brand-related eWOM on the Discord server "Gossip". Two comparable natural cosmetics brands (Brand A and Brand B) were examined within the same communication environment. Message characteristics, sender credibility, eWOM persuasiveness, brand credibility and reputation were measured using established multi-item scales (Lopez and Sicilia, 2014). All measures exceeded acceptable reliability thresholds (Cronbach's $\alpha > 0.70$). Data were analysed using factor analysis, regression, mediation and non-parametric tests.

Main Findings and Contribution

The findings demonstrate that eWOM persuasiveness shapes brand-level outcomes differently across brands within the same online community, suggesting that identical message and sender cues may produce divergent brand evaluations. For Brand A, eWOM persuasiveness negatively influenced brand credibility ($\beta = -0.267$) and brand reputation ($\beta = -0.364$), whereas positive effects were identified for Brand B ($\beta = 0.298$ and $\beta = 0.309$ respectively).

eWOM persuasiveness was primarily driven by message characteristics ($\beta = 0.680$, $p < 0.001$) and sender credibility ($\beta = 0.638$, $p < 0.001$), while receiver experience exerted a weaker influence ($\beta = 0.137$, $p < 0.001$). Consistent with the Persuasion Knowledge Model (Friestad and Wright, 1994), consumers actively evaluate communication credibility. These findings demonstrate that eWOM operates as a conditional mechanism rather than a uniformly positive driver of brand outcomes.

Originality and Value

This study extends eWOM research by demonstrating that identical persuasion cues can generate divergent brand credibility and reputation outcomes within the same online community, challenging assumptions of uniformly positive eWOM effects. By highlighting the interpretive role of consumers in anonymous online communities, the study positions eWOM as a conditional persuasion mechanism rather than a universally positive driver of brand outcomes.

Theoretical and Practical Implications

The findings suggest that anonymous platforms such as Discord may significantly influence brand evaluations through eWOM communication. Marketers should therefore monitor anonymous online communities alongside traditional social media.

Research Limitations

The study focused on Lithuanian natural cosmetics brands, which may explain the predominance of female respondents. Future research should investigate more diverse product categories. Another limitation concerns the focus on anonymous eWOM channels. Future studies should further examine trust formation in anonymous online communities and compare anonymous platforms, such as Discord and Reddit, with non-anonymous platforms, including Facebook and LinkedIn.

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THE FINANCIAL LITERACY PARADOX IN DIGITAL PAYMENTS: RISK PERCEPTION AND CONSUMER BEHAVIOUR

Drago, Carlo[1]; Graziano, Elvira Anna[2], Graziano; Petroccione, Gerardo[3]

[1] Department of Economic, Psychological, Communication, Educational and Movement Sciences, University Niccolò Cusano, Rome, Italy

[2] Department of Human Science, Link Campus University, Rome, Italy

[3] Department of Experimental and Clinical Medicine, Polytechnic University of Marche, Ancona, Italy

Keywords: Digital Payments, Financial Literacy, Fraud Perception, Scam Susceptibility, Payment Behaviour, Consumer Finance, Fintech Adoption.

Introduction

Payment behaviours have evolved rapidly, even in cash-reliant countries, driven by technological innovation and fintech expansion (Cotugno et al., 2024). COVID-19 accelerated digital payment adoption, while digitalization also increased exposure to fraud, cybercrime, and identity theft (Graziano et al., 2025). Payment choices are shaped not only by convenience but also by fear of fraud, scam susceptibility, and financial literacy (Brands & Van Doorn, 2022).

Purpose and Research Objectives

This study examines how fraud perception, scam vulnerability, and financial literacy influence digital payment attitudes and cash preference. It explores whether financially literate consumers may also display stronger risk awareness and distrust toward digital payments, creating a potential “financial literacy paradox”. The study also identifies latent consumer profiles combining financial literacy, perceived risk, and payment attitudes.

Literature Review and Theoretical Framework

Digital payment adoption depends on trust and risk perceptions (Shree et al., 2021). Fear of fraud represents a major barrier to digital transactions (Brands & Van Doorn, 2022). The growing diffusion of AI-based scams, phishing systems, and deepfake technologies may further increase distrust toward digital financial ecosystems. Financial literacy is generally associated with better financial decisions, yet greater knowledge may also increase awareness of cyber risks and fraud exposure (Klapper &

Lusardi, 2020). This creates a paradox in which financially literate consumers may simultaneously display higher technological competence and stronger risk aversion toward digital payments. Scam vulnerability also depends on socio-demographic and behavioural factors (DeLiema et al., 2020). Integrating behavioural and financial literacy perspectives is therefore crucial to understanding payment choices.

Methodology

The study uses a CAWI survey conducted in Italy between November 2025 and January 2026. The sample includes 350 respondents recruited through social media, university networks, and hospital facilities. The questionnaire covered socio-demographics, fraud experience, perceived risk, payment attitudes, and financial literacy. The analysis followed two stages (see Drago et al., 2025): Multiple Correspondence Analysis (MCA) identified latent dimensions, while hierarchical cluster analysis identified homogeneous consumer profiles. This approach captures behavioural patterns that may not emerge through conventional regression methods.

Expected Findings and Contribution

The study expects to identify consumer segments differentiated by financial literacy, fraud perception, and payment preferences. Greater perceived vulnerability to scams may correlate with stronger cash preference and lower trust in digital payments. Findings are expected to show that payment choices depend not only on financial knowledge but also on subjective perceptions of cyber risk, particularly in the context of AI-enabled fraud. The study contributes to the debate on the non-linear relationship between financial literacy and digital payment adoption, highlighting the coexistence of technological competence and risk aversion.

Research Limitations and Implications

The cross-sectional design and self-reported measures limit causal inference and generalizability. Future research could expand data collection through international online panels such as Prolific or Qualtrics. The findings suggest that policies promoting digital payments should combine financial education with strategies aimed at strengthening trust, cybersecurity awareness, and fraud prevention.

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NEW STANDARDS FOR SUSTAINABILITY REPORTING: AN ANALYSIS OF THE EUROPEAN AVIATION SECTOR

Marques, José[1]; Gois, Cristina[2]

[1]Polytechnic University of Coimbra, Coimbra, Portugal.

[2]Polytechnic University of Coimbra, CEOS.PP Coimbra, ,Coimbra, Portugal.

Keywords: Sustainability, IFRS S1 And S2 Standards, Aviation Sector, Transparency

Abstract

Sustainability has taken on a fundamental role in disseminating corporate information, with entities showing greater concern and showing society their commitment to the environment. More critical sectors, including the aviation industry, face major challenges in reducing their environmental footprint and achieving carbon neutrality.

The growing demand for greater transparency and consistency in the disclosure of non-financial information, specifically related to sustainability and the climate, led the International Sustainability Standards Board (ISSB) to publish two new standards in 2023: IFRS S1 and IFRS S2. The main objective of this new standard is to standardize the disclosure of sustainability and climate risk information.

In addition to contributing to a better understanding of the adoption of IFRS S1 and IFRS S2, this article aims to analyze the compliance of sustainability reporting by various entities in the aviation sector with the new ISSB standards, seeking to identify areas for improvement in the future.

In a sector strongly challenged by the transition to greater energy efficiency, which is seeking to be increasingly sustainable, it is important to keep up with the new international sustainability reporting requirements, which contribute to the adoption of more transparent, responsible, and truthful practices.

Introduction

Growing awareness of ESG issues has transformed the reporting of financial and nonfinancial information. In the high-impact aviation sector, this requires structured, transparent disclosure.

The ISSB introduced IFRS S1 and S2 to harmonise and improve the quality of sustainability reporting.

The adoption of IFRS S1 and S2 advances the standardisation of sustainability disclosures, enhancing transparency and comparability across companies and sectors. However, implementation challenges remain, particularly in integrating with existing regulations and ensuring compliance.

In the case of European airlines, the application of these standards takes on added importance, as the sector faces increasing pressure to reduce carbon emissions and adopt sustainable practices. Thus, this article aims to analyse the application of IFRS S1 and IFRS S2 standards in the sustainability reports of major European airlines.

The study comprises five parts: an introduction, a literature review focusing on key sustainability reporting standards and the emergence of international standards developed by the International Sustainability Standards Board (ISSB), comparing them with the recent standards developed by the European Commission, the Corporate Sustainability Reporting Directive (CSRD). The third part focuses on the methodology adopted. The fourth part presents and discusses the results obtained, and finally, the last part of this study presents its main conclusions, highlighting its limitations and possible directions for future research.

Literature Review

Growing global concern about climate change, carbon footprints, fossil fuel use, pollution, and waste has led organisations to implement mechanisms to minimise the environmental impacts of their core activities. Increased stakeholder pressure for more detailed information on environmental, social, and corporate governance performance has driven the production of sustainability reports, previously known as social responsibility reports, which have become increasingly common over recent decades (Friske, Nikolov, and Morgan, 2023). Sustainability reporting has resulted from growing awareness of environmental and social issues and stakeholder demand for ESG information. According to Brogonzoli (2005), sustainability reporting “combines accounting information with ethical and social aspects to effectively communicate how an entity seeks to achieve its objectives”. As Waris and Din (2023) reiterate, transparent sustainability reporting and sound environmental management practices reinforce corporate legitimacy by demonstrating regulatory compliance and commitment to sustainability.

Given the growing importance of non-financial reporting for stakeholders, coupled with increased interest in information on corporate sustainability, two new sets of standards for sustainability reporting emerged in 2023: International Financial Reporting Standards (IFRS S1 and IFRS S2) and European Sustainability Reporting Standards (ESRS).

In June 2023, IFRS S1 and S2 were published. According to Liikanen (2023), they provide investors with globally comparable sustainability disclosures and may guide market prices without restricting additional jurisdictional requirements. The ISSB aims to harmonise reporting, reduce duplication, and integrate sustainability information with financial statements. IFRS S1 addresses short-, medium-, and long-term sustainability risks and opportunities, while IFRS S2 provides climate-related guidelines for identifying, measuring, and disclosing information for resource allocation.

In the European context, and in line with the European Green Deal, the European Sustainability Reporting Standards (ESRS) were published in 2023. On 31 July 2023, the European Commission released the first set, covering 12 key topics (Suta, Molnár, Limbach, and Tóth, 2025). The directive gives equal weight to financial and non-financial information, introduces mandatory external assurance, and adopts a dual materiality perspective, integrating sustainability reports into the management report (EFRAG, 2023).

This approach gives entities a broader view of sustainable performance beyond financial reporting. Sectors with high energy use and environmental impact, such as commercial aviation, are especially relevant. Despite its recent development, aviation has grown rapidly, with traffic increases driving higher fossil fuel use and greenhouse gas emissions.

Chapman (2007) notes that fuel consumption is highest during take-off, so short-haul flights use disproportionately more fuel per kilometre. As oil dominates transport fuel, aviation is a major contributor to global warming, accounting for about 2.6% of CO_2 emissions and 3.5% of the anthropogenic greenhouse effect (Staples, Malina, Suresh, Hileman, and Barret, 2018). With evolving legislation and non-financial reporting standards, companies face growing pressure to disclose information that reflects their sustainability commitments and impacts on financial and strategic planning.

Research Methodology

This study aims to analyse the applicability of ISSB standards requirements and demands in the sustainability reports of European airlines. In order to conduct an in-depth analysis of the

application of IFRS S1 and S2 standards, the most relevant items were listed in a checklist to assess their application in the sustainability reporting of airlines. With a particular focus on issues related to sustainability and its risks and opportunities, we first have the following topics arising from the application of IFRS S1 (Table 1):

#	Standard	Topics
1	IFRS S1	Identification of sustainability-related risks and opportunities
2	IFRS S1	Identification of governance processes, controls and procedures used to monitor, manage and oversee sustainability-related risks and opportunities
3	IFRS S1	Identification of the strategy implemented to manage sustainability-related risks and opportunities
4	IFRS S1	Identification of processes to identify, assess, prioritise and monitor sustainability-related risks and opportunities
5	IRFS S1	Reporting calendar
6	IFRS S1	Comparative information

Table 1 - Topics to be addressed under IFRS S1

Next, and within the scope of climate information disclosure, the following topics relevant to addressing climate-related risks and opportunities arise from IFRS S2 (Table 2):

#	Standard	Topics
1	IFRS S2	Identification of climate-related risks and opportunities
2	IFRS S2	Identification of governance processes, controls and procedures used to monitor, manage and oversee climate-related risks and opportunities
3	IFRS S2	Identification of the strategy implemented to manage climate-related risks and opportunities
4	IFRS S2	Identification of the entity's strategy and decision-making in addressing the effects of climate-related risks and opportunities
5	IRFS S2	Disclosure of information relevant to cross-sectoral climate-related metric categories

Table 2 - Topics to be addressed under IFRS S2

Six European airlines were selected for this case study to ensure consistent analysis, based on comparable turnover, activity, target markets, and workforce. They belong to recognised sustainability and transport indices, including the S&P Dow Jones Index, Stoxx’s DAXsector All Transportation & Logistics, Morningstar’s Sustainalytic, and Skytrax’s World Airline Awards, enabling comparative analysis of operational efficiency, regulatory policies, and

market trends. Companies in the S&P Dow Jones Index (S&P Global, 2023) and DAXsector All Transportation & Logistics (STOXX, 2023) typically lead in technological innovation, sustainability, and environmental practices. Morningstar's Sustainalytics ranking (Sustainalytics, 2023) assesses ESG performance, while Skytrax's World Airline Awards (Skytrax, 2024) use annual surveys, such as the 'World Airline Survey' and 'World Airport Survey', to enable quantitative airline performance comparisons. Accordingly, the selected entities were Royal Dutch Airlines – KLM and Société Air France from the S&P Dow Jones Index (S&P Global, 2023), Lufthansa from the DAXsector All Transportation & Logistics (STOXX, 2023), Finnair from the Sustainalytics ranking (Sustainalytics, 2023), and Iberia and British Airways from the Skytrax ranking (Skytrax, 2024), both affiliated with the International Airlines Group (IAG). Thus, in conjunction with the central question of the study, the following research questions arise:

1. To what extent are the sustainability reports of the main European airlines aligned with the requirements defined by IFRS S1 and IFRS S2?
2. Which requirements of IFRS S1 and IFRS S2 are most frequently met by the main European airlines?
3. Are there significant differences in the degree of compliance with IFRS S1 and IFRS S2 standards among the main European airlines?

As a starting point, this study analyses the sustainable initiatives implemented prior to the adoption of IFRS standards. Table 3 presents the common and differentiating initiatives, enabling a structured assessment of the degree of homogeneity in practices before the analysis of compliance with IFRS S1 and IFRS S2. Accordingly, patterns of airline performance and alignment with the sustainability guidelines discussed above are identified (Table 3).

Sustainability Measure	Lufhtansa	Air France-KLM	Iberia	British Airways	Finnair
Renewal and modernisation of the fleet	✓	✓	✓	✓	✓
Use of SAF	✓	✓	✓	✓	✓
Carbon neutrality target by 2050	✓	✓	✓	✓	✓
Reduction in emissions per passenger by 2030	✗	✓	✓	✓	✗
Eco-piloting and efficient flying methods	✗	✓	✗	✗	✓
Carbon offsetting	✗	✗	✗	✗	✓
Customer involvement in reducing emissions	✗	✗	✗	✗	✓

✓ Refers initiatives ✗ Does not refers initiatives

Table 3 - Sustainability initiatives identified in the entities under analysis

This systematisation shows that, although there are strategic specificities between different airlines, there is a core set of measures that cut across all entities, namely fleet renewal, the use of sustainable aviation fuels (SAF) and a commitment to carbon neutrality by 2050. Following the analysis of pre-IFRS initiatives, the study aims to analyse how entities adopt and apply sustainability reporting in accordance with IFRS S1 and IFRS S2, and the benefits of such adoption. Following the establishment of the theoretical framework, the research adopts a practical approach by analysing airline sustainability reports, using the proposed checklist to assess the extent of compliance with ISSB standards.

In the context of this study, the identification of sustainability-related risks and opportunities that may affect an entity's prospects is conducted in accordance with the IFRS Sustainability Disclosure Standards (§54, IFRS S1).There is broad uniformity in risk identification. Air France and KLM adopt a structured approach, categorising transition risks across political, legal, reputational, market, and technological dimensions. Finnair integrates sustainability risks into its ERM system, incorporating climate risks into strategic and operational risks. Lufthansa links regulatory, reputational, and technological risks to innovation and energy transition. Iberia and British Airways identify risks and opportunities with specificity, emphasising technological transition, legal aspects of decarbonisation, sustainable fuels, and green financing. The analysis of governance focuses on the processes, controls and procedures used to monitor, manage and oversee sustainability-related risks and opportunities. In this

context, financial disclosures related to sustainability should "enable users of general purpose financial statements to understand the governance processes, controls and procedures that an entity uses to monitor, manage and oversee sustainability-related risks and opportunities" (§26, IFRS S1). In summary, Table 4 below lists the bodies responsible for monitoring, managing and supervising sustainability-related risks and opportunities in each of the entities analysed:

Entity	Name
Air France/KLM	Sustainable Development and Compliance Committee; Board of Directors/Supervisory Board;
British Airways/Iberia (Grupo IAG)	Safety, Environment and Corporate Responsibility Committee;
Finnair	Board of Directors; Support Committees (Audit Committee and People and Remuneration Committee);
Lufthansa	Sustainability Committee; Executive Board;

Table 4 - Committees responsible for sustainability-related risks and opportunities

All entities recognise the importance of governance in managing sustainability risks, with varying formalisation. Air France and KLM rely on the Sustainable Development and Compliance Committee alongside the Board to oversee ESG strategy and performance. The IAG Group (British Airways and Iberia) uses interconnected committees for integrated sustainability management. Lufthansa combines Executive Board leadership with a Sustainability Committee for technical support and risk monitoring. Finnair delegates ESG responsibilities to the Board and support committees. While all comply with IFRS S1, governance structures differ in specialisation.

The strategic dimension of sustainability reporting concerns the identification of the approaches adopted to manage sustainability-related risks and opportunities. Accordingly, financial disclosures in sustainability reports should provide a clear understanding of the strategy to manage such risks and opportunities, in accordance with IFRS S1 (§28 to §42). The analysed airlines demonstrate ongoing efforts. Finnair targets carbon neutrality by 2045; Air France and KLM focus on technological innovation, progressive decarbonisation, and sustainable value creation. Iberia and British Airways (IAG Group) aim for carbon neutrality by 2050, integrating ESG dimensions. Lufthansa emphasises resilience and competitiveness, leveraging innovation,

partnerships, energy optimisation, and digitalisation to manage ESG risks and opportunities, including sustainable finance. Overall, all entities adopt proactive sustainability strategies, differing in ambition, perspective, and sectoral integration. From a process-oriented perspective, the identification, assessment, prioritisation and monitoring of sustainability-related risks and opportunities are essential to ensure the reliability of disclosures. Accordingly, IFRS S1 (§43 and §44) emphasises the importance of understanding these processes, and all analysed airlines comply with these requirements. Finnair integrates ESG materiality analyses and climate scenarios into its risk management. Iberia and British Airways (IAG Group) adopt a multidisciplinary approach across Sustainability, Risk, Finance, and Strategy. Air France and KLM embed sustainability risk management within ERM, with periodic strategic reviews. Lufthansa systematically integrates risks into corporate management, assessed by probability and impact. Overall, materiality analyses, climate scenarios, and ESG integration reflect organisational maturity and strategic transparency. Differences reside mainly in process detail and stakeholder involvement, reflecting internal development and regulatory adaptation.

Financial disclosures related to sustainability must be reported by the entity at the same time as the respective financial statements, thus covering the same disclosure period (§64, IFRS S1). For practical reasons, an entity may present a report for a 52-week period instead of the conventional 12 months (§65, IFRS S1). The choice will depend on the entity's operational needs. All airlines analysed use the conventional 12-month (calendar year) annual reporting model, ending on 31 December, and do not adopt the alternative 52-week model (Table 5).

Entity	Evidence Reporting Calendar
Air France/KLM	“Consolidated financial statements for the year ended December 31, 2023”
British Airways/Iberia (Grupo IAG)	“Consolidated financial statements for the year ended 31 December 2023”
Finnair	“Financial Statements Bulletin 2023 – January 1 to December 31, 2023”
Lufthansa	“Financial statements for the financial year ended 31 December 2023”

Table 5 - Evidence from the reporting calendar of target companies

To ensure a proper understanding of sustainability-related financial disclosures, entities should disclose comparative information for the same period, including not only quantitative data but also comparative narrative and descriptive information, in accordance with IFRS S1 (§70). Thus, Table 6 suggests evidence, taken from the annual and sustainability reports of the entities under analysis, of what is reported:

Entity	Evidence Reporting Calendar
Air France/KLM	Environmental and social data with data from the same period last year. It also includes the percentage change and the respective explanation.
British Airways/Iberia (Grupo IAG)	Tables showing ESG targets for the last two years, namely carbon dioxide emissions and use of SAF.
Finnair	Environmental, social and governance data with comparison between the reporting period and the same period last year.
Lufthansa	Comparisons of all key metrics with the previous year.

Table 6 - Evidence of comparative information on target companies

In summary, the analysis indicates that the main European airlines assessed largely comply with IFRS S1 requirements for sustainability reporting. They consistently adopt structured processes for identifying and monitoring risks and opportunities, provide comparative information, and align reporting with financial statement calendars. These practices demonstrate a commitment to transparency and data quality, as well as readiness for full CSRD implementation, reflecting the increasing integration of ESG factors into strategic management and stakeholder communication.

In order to assess the degree of compliance of the entities analysed with the requirements established in IFRS S1, Table 7 was prepared, structured on the basis of the checklist developed.

Checklist IFRS S1	Lufhtansa	Air France-KLM	Iberia	British Airways	Finnair
Identification of sustainability-related risks and opportunities	✓	✓	✓	✓	✓
Identification of governance processes, controls and procedures	✓	✓	✓	✓	◯
Identification of the strategy for managing risks and opportunities	✓	✓	✓	✓	✓
Identification of evaluation and monitoring processes	✓	✓	✓	✓	✓
Reporting calendar	✓	✓	✓	✓	✓
Comparative information	✓	✓	✓	✓	✓

✓ High Compliance ◯ Partial Compliance

Table 7 - Summary table showing the degree of compliance of the entities under review with IFRS S1

The table should be interpreted according to the legend: green indicates full compliance with the standard, while yellow denotes partial compliance, reflecting generic or insufficiently detailed approaches. Overall, the analysis shows a high degree of compliance among the entities, particularly regarding risk and opportunity identification, strategy, and reporting schedule. Finnair, however, stands out for having a less specialised governance structure, reflecting a less formalised approach to sustainability oversight despite meeting most requirements.

The identification of climate-related risks and opportunities is central to sustainability reporting, and entities shall disclose information enabling users of financial statements to understand these risks and opportunities (§10, IFRS S2). Airline disclosures on climate risks and opportunities align with IFRS S2 (§10), with varying detail. Finnair uses a structured ERM system integrating physical risks and transition opportunities. Air France and KLM differentiate acute and chronic risks, linking them to mitigation and opportunities. The IAG Group (British Airways and Iberia) identifies key risks and opportunities, focusing on carbon neutrality. Lufthansa emphasises physical risks and opportunities in innovation and fleet decarbonisation. All companies recognise climate issues as central to their business models, increasingly integrating them into strategy and reporting.

The governance of climate-related risks and opportunities requires entities to clearly present information on the processes, controls, and procedures in place. This includes identifying the governance body and its responsibilities (§6, a, IFRS S2), as well as detailing management's role in implementing these processes, including delegation and effective control mechanisms (§6, b, IFRS S2). Air France and KLM rely on the Sustainable Development and Compliance Committee to support the Board in environmental and social integration. The IAG Group (British Airways and Iberia) assigns climate oversight to the Safety, Environment and Corporate Responsibility Committee. Finnair uses a dual structure with the Board and specialised committees, while Lufthansa involves the Executive Board and Sustainability Committee to integrate climate considerations into strategy.

Understanding an entity's strategy for managing climate-related risks and opportunities is central to climate-related financial disclosure. These disclosures should cover impacts on the business model, value chain, decision-making, financial planning, and the resilience of the overall strategy (§9, IFRS S2). Airline strategies converge on fleet renewal, sustainable fuels, digitalisation, and innovation. Finnair proactively mitigates risks and capitalises on opportunities, positioning as a green aviation benchmark. Air France and KLM focus on

regulatory adaptation, energy efficiency, and integrated risk management via a Climate Action Plan. Iberia and British Airways (IAG Group) integrate climate into financial and planning structures, investing in SAF, fleet renewal, operational optimisation, and partnerships. Lufthansa structures its strategy around fleet renewal, SAF, operational optimisation, and innovation, with technological partnerships for alternative propulsion.

Understanding the entity's strategy and decision-making in addressing climate-related risks and opportunities requires clear disclosure in corporate reports. This includes how such risks and opportunities affect strategy, business model adjustments, mitigation and adaptation efforts, transition plans, environmental targets, supply chain restructuring, and the progress of prior initiatives (§14, IFRS S2). The airlines' strategies align with guidelines. Finnair focuses on operational and fleet efficiency, SAF, and technological partnerships. Air France and KLM implement the Climate Action Plan, prioritising fleet modernisation, fuel optimisation, and emerging technologies. British Airways and Iberia (IAG Group) pursue decarbonisation with 2030 and 2050 targets, emphasising fleet renewal, eco-piloting, SAF, technology, and governance. Lufthansa adopts a holistic strategy on fleet renewal, SAF, innovation, and residual emissions compensation.

Disclosure of information relevant to cross-sectoral climate-related metric categories involves reporting quantitative and qualitative targets, including voluntary and regulatory goals.

Entities should specify metrics, objectives, organisational scope, application period, benchmarks, intermediate milestones, and indicate whether targets are absolute or intensitybased (§33, IFRS S2). The airlines show commitment to climate mitigation and IFRS S2 compliance (§33–34). Lufthansa targets carbon neutrality by 2050, with a 50% emissions reduction by 2030. Iberia and British Airways (IAG Group) track fuel efficiency, SAF use, and carbon offsets, also monitoring climate adaptation. Air France and KLM implement robust decarbonisation strategies, exceeding SAF requirements. Finnair aims for carbon neutrality by 2045 and a 50% emissions reduction by 2025.

Overall, all airlines report climate targets aligned with IFRS S2, with specific metrics, showing a common trend of integrating climate considerations into strategy and adopting transparent, comparable reporting practices. Similar to IFRS S1, a table was constructed to assess the degree of compliance of entities with the requirements stipulated in IFRS S2 (Table 8).

Checklist IFRS S2	Lufhtansa	Air France-KLM	Iberia	British Airways	Finnair
Identification of climaterelated risks and opportunities	✓	✓	✓	✓	✓
Governance of climate risks and opportunities Strategy for managing climate risks and opportunities	✓	✓	✓	✓	○
Decision-making and strategic response to climate risks	✓	✓	✓	✓	✓
Reporting calendar Disclosure of climate metrics and targets	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓
	✓	✓	✓	✓	✓

✓ High Compliance ○ Partial Compliance

Table 8 - Summary table showing the degree of compliance of the entities under review with IFRS S2 When reading the table, the criteria defined for assessing compliance must be taken into account: the green symbol corresponds to high compliance, indicating that the entity meets the regulatory requirements in a structured and detailed manner; and the yellow symbol indicates partial compliance, where the issues are addressed, but in a generic or incomplete manner.

In examining and discussing the results, it is evident that none of the studied entities formally apply IFRS S1 or S2, nor is there evidence of imminent adoption. Despite this, their disclosures generally reflect most of the standards' requirements. Reports remain concise and occasionally repetitive, while highlighting commitments to ESG improvement, decarbonisation, ongoing SAF use, and operational efficiency.

From the analysis of sustainability reports, it is important to assess whether emissions have decreased and regulatory and financial requirements are being met. Airlines disclose 2030 decarbonisation targets, which should be compared with 2023 CO_2 emissions, themselves based on 2019 levels. A gradual decline is expected, aiming for net zero by 2050 (Graph 1):

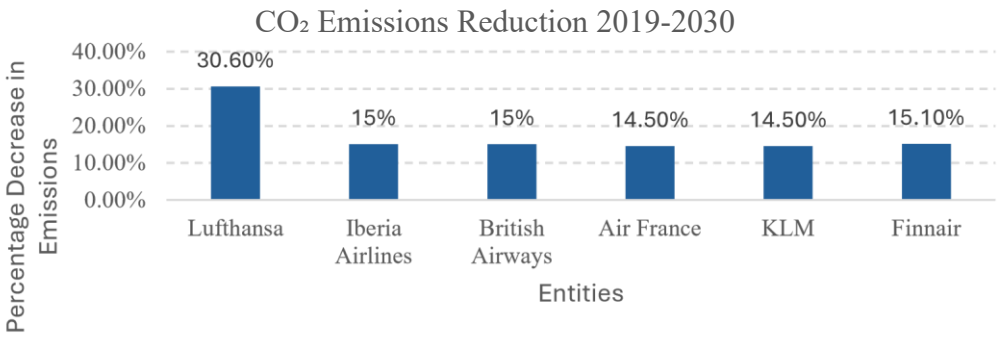


Chart 1 – Reduction in carbon dioxide emissions by 2030 for target companies, compared to 2019

The variation between the current percentage of emissions and the target set for 2030 highlights different challenges for each entity. Lufthansa has recorded a significant reduction in its emissions, rapidly approaching its interim targets, while the others will have to intensify their strategies to ensure that the objectives are met (Chart 2).

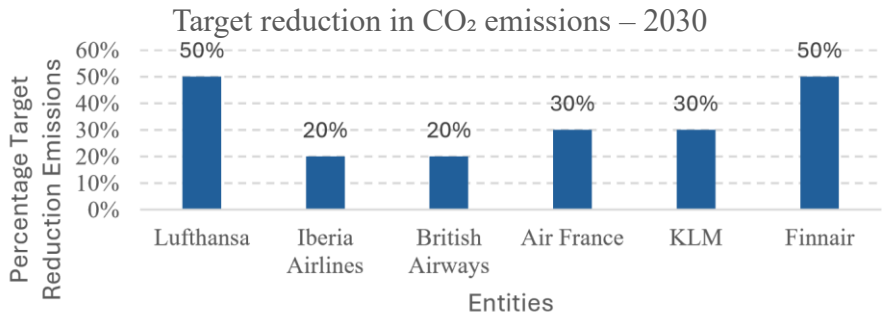


Chart 2 – Target for reducing carbon dioxide emissions by 2030 for target companies

The pace of decarbonisation depends on fleet renewal and sustainable aviation fuel (SAF) use. Chart 3 presents the current and 2030 SAF incorporation targets disclosed by the airlines.

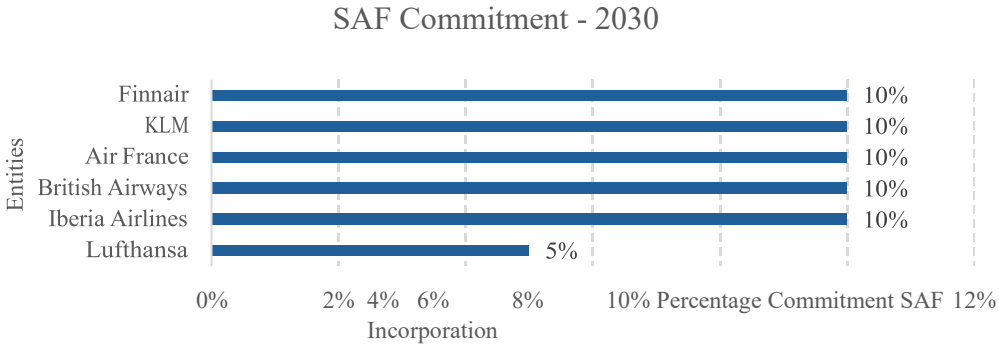


Chart 3 – Commitment to implement SAF by target companies by 2030

Similarly, with the exception of Lufthansa, all airlines report quantitative data on current SAF consumption, enabling assessment of actual compliance with proposed measures (Chart 4).

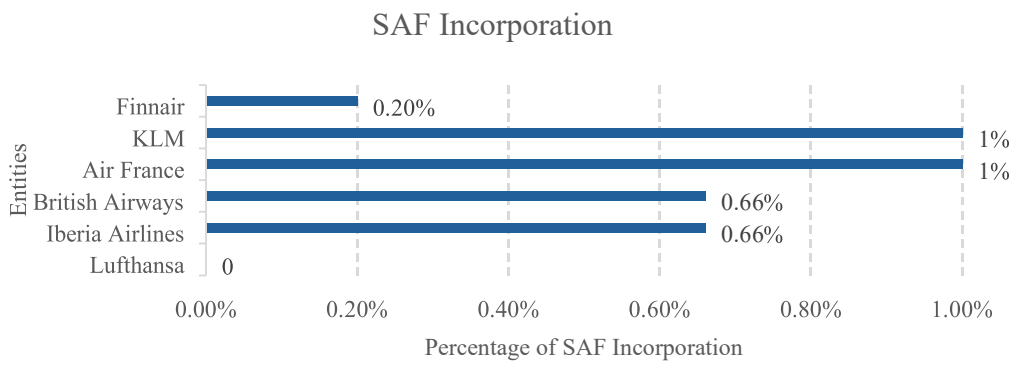


Chart 4 – Incorporation of SAF into the fuel consumption of target companies

Fleet renewal, as part of climate strategy, constitutes a material action in managing related risks and opportunities. To assess implementation, the average fleet age of each airline is shown in Chart 5.

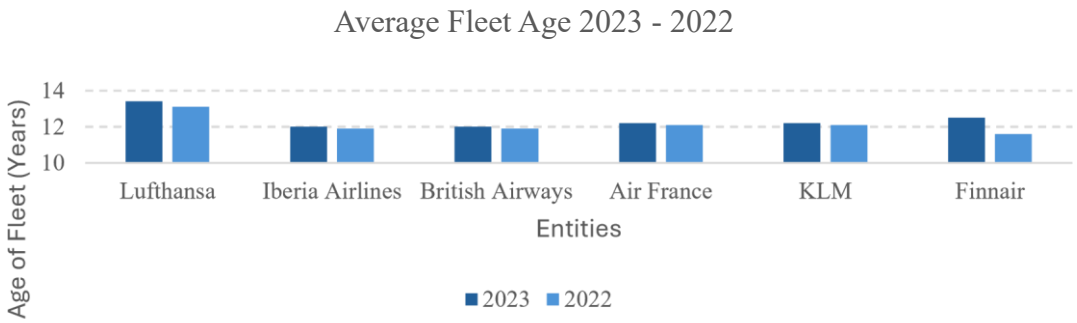


Chart 5 – Comparison of the average age of the target companies' fleets between 2023 and 2022

There is a rising trend in average fleet age compared to the previous year, reflecting operational and strategic challenges with potential future impacts.

Beyond assessing IFRS S1 and S2 reporting, it is essential to use quantitative data to verify whether entities implement the measures they report. Since these standards are not yet mandatory, the study's findings can be viewed positively. The primary objective of the standards is to improve the environmental impact of operations, enhancing process sustainability. Despite being highly exposed to sustainability challenges, the sector has opportunities to balance operational development with sustainable practices.

Conclusion

This study examined IFRS S1 and S2 application in the sustainability reports of Lufthansa, Iberia, British Airways, Air France, KLM, and Finnair, analysing ISSB compliance. Reports

generally show moderate to high alignment, with climate targets, reporting schedules, and strategic governance most consistently met, while governance specialisation and metric systematisation show lower compliance. Differences reflect organisational model, climate maturity, and regulatory anticipation. In conclusion, while IFRS S1 and S2 advance the standardisation of sustainability disclosures, their widespread adoption remains limited. Implementation and regulatory oversight contribute to a more responsible and transparent aviation sector, aligned with global sustainable development goals.

The limitations of the study include, first and foremost, the fact that IFRS S1 and IFRS S2 were only published in 2023. In addition, although the checklist-based methodology allows for a general assessment of compliance with IFRS S1 and IFRS S2, it does not capture all the qualitative nuances of the reporting practices adopted by entities. For future studies, it would be interesting to carry out a comparative approach that includes airlines from different continents, allowing for a comprehensive approach to the variations in the adoption of these standards and how they may impact the sustainable reporting of entities in the aviation sector. Additionally, it would be relevant to assess the impact of the adoption of IFRS S1 and IFRS S2 on the perception of stakeholders and other users of sustainable information, analysing the transparency and reliability of reporting and the financial performance of companies.

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ACCOUNTING STANDARDISATION UNDER SALAZAR'S CORPORATIST REGIME: THE PIONEERING ROLE OF THE INSURANCE INSPECTORATE, 1929–1949

Ventura, Joana[1]; Azevedo, Graça[2]; Góis, Cristina[3]

[1]DGEIT, Aveiro University, Aveiro, Portugal

[2]Institute of Higher Learning in Accounting and Administration, Aveiro University, Aveiro, Portugal

[3]Coimbra Business School, Polytechnic University of Coimbra, Coimbra, Portugal

Keywords: Accounting Standardisation, Insurance Industry, Public-Interest Theory, Portugal, Corporatist

Abstract

This study examines the paradox of early accounting standardisation in the Portuguese insurance industry during the interwar period within a corporatist political context. Although Portugal remained one of Western Europe's most economically backward (Lains, 2003) countries, the State introduced compulsory uniform accounting rules for insurance companies as early as 1929. The new regulatory framework required insurers to adopt standardised accounts, calculate technical reserves according to prescribed methods, and submit uniform financial statements to the Insurance Inspectorate. These measures preceded Portugal's first general accounting plan by several decades and constitute one of the earliest examples of industry-specific accounting regulation in Europe. The study addresses the question why did the insurance industry become the pioneer sector for accounting standardisation?

The research follows a traditional accounting history approach, observing accounting as a technical administrative instrument embedded within broader institutional and regulatory developments. A qualitative documentary analysis was conducted using primary sources preserved in the Insurance Inspectorate's Historical Archive in Lisbon, including legislation, circulars, inspection reports, technical opinions, and official correspondence. The analysis traces regulatory developments between 1929 and 1949, identifying changes in accounting recognition, measurement and presentation requirements. Public Interest Theory (Posner, 1974) provides the principal theoretical framework, interpreting accounting regulation as a

governmental response to market failures arising from insurer insolvencies, information asymmetries and the need to protect policyholders.

The study demonstrates that the introduction of compulsory accounting uniformisation cannot be understood without considering the economic and institutional weaknesses of the Portuguese insurance market (Mendes, 2014). Insurance activity expanded under limited regulatory oversight while accounting practices remained highly heterogeneous. Insurers applied different valuation methods, reserve calculations techniques as well as reporting formats. The absence of comparable financial information significantly constrained the Insurance Inspectorate' ability to assess insurers' solvency and financial soundness (Garcia, 1935).

The situation deteriorated after the First World War. Several insurers experienced financial distress owing to inadequate technical reserves, speculative investments and excessive dividend distributions, undermining public confidence in the insurance market (Mendes, 2014). Earlier legislation had introduced minimum capital requirements and licensing procedures, but the Insurance Council lacked the technical expertise and legal authority required to ensure effective supervision. The creation of the Insurance Inspectorate in 1929 therefore represented a fundamental institutional reform that transformed accounting from a private organisational practice into an instrument of prudential regulation.

The findings show that accounting standardisation formed part of a broader oversight strategy designed to improve market discipline and strengthen administrative control. The Insurance Inspectorate required all insurance companies to adopt uniform accounting classifications, standardised financial statements and prescribed methods for measuring technical reserves. These requirements enabled the Insurance Inspectorate to compare insurers consistently, monitor financial performance, evaluate solvency and identify potential weaknesses before they threatened policyholders. Unlike its predecessor, the Insurance Inspectorate possessed effective enforcement powers, including on-site inspections, mandatory reporting requirements, requests for additional accounting information and, where necessary, the suspension or withdrawal of operating licences (Garcia, 1935). Compliance therefore depended not only on the technical design of accounting rules but also on the development of an administrative apparatus capable of enforcing them.

The analysis further argues that insurance became the first sector to experience compulsory accounting standardisation because of its distinctive economic characteristics. Insurance contracts involve long-term obligations whose fulfilment depends upon insurers' future financial capacity, creating substantial information asymmetries between companies and policyholders. Reliable accounting information was therefore essential for financial oversight

and consumer protection. Furthermore, the significant presence of foreign insurance companies raised concerns regarding market stability, competitive conditions and capital outflows, reinforcing the state's incentive to establish uniform accounting requirements that could be consistently applied across domestic and foreign firms.

The Portuguese case challenges dominant explanations (Camfferman and Detzen, 2018), that associate accounting standardisation primarily with the development of capital markets, professional accounting bodies or investor demand. Instead, it demonstrates that accounting uniformisation may emerge through state intervention in response to market failures and broader projects of administrative modernisation. Sector-specific regulation therefore preceded, and arguably facilitated, the later development of general accounting regulation in Portugal.

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PANDEMIC CONTEXT AND IMPLICATIONS FOR PORTUGUESE SMES' INTERNATIONALISATION

Mendes, Mafalda[1]; Silva, Patrícia[2]

[1] Business Research Unit (BRU-IUL), Iscte-Instituto Universitário de Lisboa, Lisbon, Portugal

[2] Business Research Unit (BRU-IUL), Iscte-Instituto Universitário de Lisboa, Lisbon, Portugal

Keywords: Internationalisation, SMEs, Portuguese SMEs, Pandemic, Covid-19

Introduction

SMEs support Europe's economy, representing 99.8% of all enterprises, employing 65% of all workforces and being responsible for 52.8% of the value added (European Commission, 2014; Eurostat, 2021).

SMEs who were internationalised outperformed those which had not, proving that internationalisation, performance, competitiveness and growth are linked (European Commission, 2014).

Literature Review

According to the last SBA Fact Sheet of Portugal from 2019, the country is considered one of the worst members in the EU in terms of internationalisation. Portugal's small and pressured market and unfavorable economic conditions make internationalisation essential for SMEs to remain competitive and ensure long-term continuity of operations (Portugal Global, 2013). Additionally, some authors have highlighted how valuable it has been for SMEs to increase their activities across national boundaries after periods of recession like the past economic and financial crisis (Pacheco, 2019).

Purpose, Aim and Objectives

The most recent event which could be compared to previous recession periods is the pandemic of Covid-19, impacting companies and economies.

With the pandemic shutting down companies and suppressing countries' economies, it is important to, mainly, comprehend what are the impacts of this pandemic context for SMEs and the role of internationalisation in this process.

Methodology and Methods

A questionnaire was developed and distributed via an online platform, Google Forms. The form was closed after three months with a sample size of 309 responses valid responses. The analysis of the data collected was completed with resort to the software program SPSS.

Findings and Contribution

Internationalisation was more advantageous for firms before the pandemic while during this period, SMEs had a decrease in international sales, contrarily to what occurred during the economic crisis of 2008 when for some firms, internationalisation was the key for their survival (Éltető, 2018).

Internationalised smaller firms are known to have more restrictions than larger firms (LeMay and McMahon, 2026), indeed, it has been verified that larger internationalised SMEs had better outcomes than smaller ones. Digitalization and the number of years a firm operates abroad are still regarded as important factors which helped companies overcome the pandemic. As firms keep internationalising over the years, they acquire more experience resulting in an increase in turnover. Furthermore, internationalised SMEs having a global network was another important resource to tackle the hardships of the pandemic which facilitates the internationalisation process (Han, Goxe and Freeman, 2024).

Originality and Value

The study adds to the existing literature by addressing the most recent global crisis, the pandemic which impacted SMEs' internationalisation and highlights how firms should develop contingency plans to prevent future events like this.

Research Limitations

The main limitation of the study is that not all aspects of the pandemic were analyzed due to the diverse list of implications. The method used to collect data was a lengthy online survey due to the nature of the research, but these usually have lower response rates since being external to the participant firms reduces the trust when answering the form. Finally, the dataset lacks sector representativeness and is heavily clustered in major cities.

Theoretical and Practical Applications and Implications

By better understanding the underlying implications and the methods used to approach the pandemic, firms can pay more attention to certain resources. Investing in partnerships can provide valuable information and resources which can improve performance and turnover. Digitalization should be accelerated to help SMEs overcome physical trade barriers. Through experiential knowledge, managers can be better prepared for challenges ahead and manage their resources more effectively.

In terms of theoretical implications, research should gear towards the interplay between different factors instead of focusing on isolated elements considering that more than one component influences the process of Internationalisation. Additionally, these findings add to the knowledge of context-specific scenarios, in this case, the pandemic which can be compared to other crisis of economic nature or geopolitical conflicts.

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THE PRICE OF CARBONWASHING: STOCK MARKET REACTIONS TO CLIMATE SIGNALING FAILURES

El Alfy, Amr[1]; Nassar, Mohamed[1]

[1]School of Environment, Enterprise and Development (SEED), University of Waterloo, Waterloo, Canada

Keywords: Carbonwashing, Greenwashing, ESG Controversies, Climate Disclosure Credibility, Signalling Theory, Event Study, GHG Emissions, Market Reaction.

Introduction

Climate change has transformed corporate environmental disclosure from a voluntary communication exercise into a central component of governance, risk management, and capital market valuation. Regulatory frameworks, including the Task Force on Climate-related Financial Disclosures (TCFD), the International Sustainability Standards Board (ISSB), and the EU Corporate Sustainability Reporting Directive (CSRD), have elevated carbon reporting as a core accountability mechanism. Yet the growing strategic importance of climate disclosure also creates incentives for firms to engage in carbonwashing, which reflects the selective disclosure, omission, or exaggeration of greenhouse gas (GHG) emissions data and climate commitments, posing significant risks to market credibility and investor decision-making.

Purpose, Aim and Objectives

This study examines whether capital markets penalise firms for carbonwashing-related controversies and under what conditions such penalties occur. Specifically, it investigates how the visibility of carbonwashing incidents moderates investor reactions to misleading or selective corporate GHG disclosures among S&P 500 firms. The study aims to advance understanding of when carbonwashing becomes financially material and to extend signalling theory to the context of carbon disclosure credibility.

Literature Review and Theoretical Framework

Prior research shows that transparent carbon disclosure reduces information asymmetry, strengthens investor confidence, and lowers cost of capital (Matsumura et al., 2014). Conversely, greenwashing undermines consumer and investor trust (Santos et al., 2024). Carbonwashing, which is a carbon-specific form of greenwashing, encompasses misleading emissions reporting, overstated reduction targets, and symbolic climate commitments without substantive action (In & Schumacher, 2021). Grounded in signalling theory (Spence, 1978), this study conceptualises carbon disclosures as credibility signals; when carbonwashing is exposed, these signals lose integrity, triggering investor uncertainty and valuation corrections. Media visibility amplifies this process by broadening information diffusion (Tetlock, 2007).

Methodology and Methods

The study analyses 29,567 firm-incident observations from 191 S&P 500 firms over 2010-2023, using ESG controversy data from RepRisk. A standard market-model event study estimates cumulative abnormal returns (CARs) over a [-2, +2] event window, with a 120-day pre-event estimation window. Non-parametric tests -- including a CHAID decision tree and Mann-Whitney U test -- complement panel regressions incorporating firm and time fixed effects. Key interaction terms (Reach x GHG; Environment x GHG) capture the joint effect of media visibility and carbon salience on investor reactions.

Main Findings and Contribution

Capital markets do not uniformly penalise ESG controversies. The CHAID analysis identifies media reach as the primary determinant of CAR variation (chi-squared = 45.33, $p < 0.001$). High-reach GHG-related events exhibit significantly more negative CARs than other incidents (Mann-Whitney U, $p = 0.015$), with greater return dispersion and heavier downside tails. Panel regression confirms that Reach ($b = -0.0054$***), Reach x GHG ($b = -0.0105$**), and Environment x GHG ($b = -0.0128$**) are the key drivers of negative market reactions. Generic greenwashing allegations produce no significant standalone market penalty. Carbonwashing becomes financially material only when it is carbon-salient and widely disseminated.

Originality and Value

This study is among the first to empirically distinguish carbonwashing from broader greenwashing and examine its distinct financial consequences. It extends signalling theory by demonstrating that capital markets price not only carbon performance but also the credibility

of carbon disclosures. The findings reconcile previously mixed evidence on the financial impact of greenwashing by identifying media visibility as the critical contingency, with particular relevance for firms operating under CSRD and ISSB frameworks.

Research Limitations

The study focuses on short-term market reactions and relies on RepRisk data, which may not capture all instances of misleading climate disclosure. The sample is limited to S&P 500 firms, constraining generalisability. Future research could explore long-term financial consequences, cost of capital effects, and cross-country comparisons under differing regulatory regimes, including the European CSRD environment.

Theoretical and Practical Applications and Implications

Theoretically, the findings extend signalling theory to the domain of carbon disclosure credibility. For managers, the results highlight the financial risks of misleading climate disclosures and underscore the need for robust emissions governance. For investors, disclosure credibility should be incorporated into climate risk assessments. For regulators, the findings support strengthening verification and assurance mechanisms under ISSB and CSRD to reduce information asymmetry and support efficient capital allocation.

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IS THE ORCHESTRATOR BECOMING DIGITAL WITH AI IN INNOVATION ECOSYSTEMS? CONCEPTUAL INTEGRATION AND RESEARCH OPPORTUNITIES.

Folino, Giorgia[1]; Usai, Antonio[1]; Iesu, Michela[2]

[1]Department of Economics and Business Sciences, University of Sassari, Italy

[2]Department of Humanities and Social Sciences, University of Sassari, Italy

Keywords: Innovation Ecosystems, Artificial Intelligence, Ecosystem Orchestration, Digital Governance, Hybrid Orchestration, Conceptual Research.

In today's rapidly evolving business landscape, the concept of Innovation Ecosystems (IE) has emerged as a central framework for collaborative value co-creation and capture among interdependent actors (Adner, 2017; Gomes et al., 2018; Granstrand & Holgersson, 2020; Thomas & Autio, 2019). Within these ecosystems, orchestration plays a central role in coordinating actors, aligning incentives, and facilitating knowledge sharing (Autio, 2021; Ritala et al., 2013). Contemporarily, rapid advances in digital technologies, and in particular artificial intelligence (AI), are increasingly supporting communication, operational performance, and decision-making processes across organizational networks (Begeç & Akyuz, 2023; Beliaeva et al., 2019). Nevertheless, the implications for AI in shaping ecosystems development and orchestration remains underexplored (Marchese et al., 2025; Kindermann et al., 2022). Thus, this research-in-progress aims to investigate whether the integration of AI is yet merely supporting the human activity or is reshaping the logic of IE coordination.

From the methodological standpoint, the study adopts a conceptual research design based on integrative literature review (Torraco, 2016; Cronin & George, 2020), and synthesizes insights from innovation ecosystem orchestration, platform governance and digital innovation literature to identify conceptual convergences. Papers were scouted through searches in Google Scholar using combinations of key words including *innovation ecosystem*, *ecosystem orchestration*, *ecosystem governance*, *artificial intelligence*, *AI*, and *digital platforms*. Subsequently, contributions were analysed focusing on ecosystem coordination mechanisms, orchestration activities and AI-enable decision support. The preliminary results provided the foundation for developing an exploratory conceptualization of the notion of digital orchestrator.

Building on Souza et al. (2023), the analysis first examines how AI enhances the four orchestration activities of ecosystem emergence, namely *mapping*, *engaging*, *sense-making*, and *designing* (Souza et al., 2023). In the mapping phase, AI enables orchestrator to process large volumes of data (e.g., customer reviews, social media, and other textual sources) to detect needs, pain points, and evolving preferences (Chin et al., 2024). Similarly, by scanning large volumes of scientific publications, patent data, and online sources to uncover external talent, expertise, and complementary capabilities, AI strengthens the orchestrator's engaging activity consisting in partner identification, (Holgersson et al., 2024), thereby expanding opportunities to discover and match with previously unknown collaborators. Therefore, AI reinforces the sense-making task through predictive analytics and digital twin technologies that simulate scenarios and outcomes (Holgersson et al., 2024), thus supporting decision-making under uncertainty. Finally, during the designing phase, through the *generative*, *convergent*, and *combinatorial* properties of digital technologies that foster the creation of novel solutions, cross-domain integration, and modular recombination of resources (Marchese et al., 2025), AI facilitate the establishment of flexible governance mechanisms and value-sharing arrangements. These applications highlight how AI enhances the traditional orchestration activities. However, the present work suggests a more fundamental transformation, as three different models of orchestration can be detected. In particular, the traditional orchestrator model, where digital technologies only support the human-based coordination activities; the AI-supported orchestrator, where AI provides recommendations and forecasts supporting the decision-making, while the decisional authority remains with the focal firm; and lastly, the digital orchestrator model, where data-driven rules, automated processes, and learning algorithms autonomously shape partner selection, collaboration intensity, and knowledge flows across the ecosystem, increasingly decentralizing the coordination activity. In this emerging configuration, the decision-making authority is thus progressively redistributed between human orchestrators and AI systems. Subsequent implications become more evident in the more mature stages of the IE lifecycle, where multiple projects and overlapping networks constantly develop and dissolve overtime (Souza et al., 2023), requiring real-time orchestration mechanisms exceeding the capacity of the traditional models. In these contexts, AI-based approaches like multi-agent systems provide a decentralized way to coordinate, where autonomous agents follow predefined rules to align goals, allocate resources, and adapt as conditions change (Holgersson et al., 2024), enabling orchestration to emerge from distributed algorithmic interactions rather than relying on hierarchical control.

Accordingly, the present work places the digital orchestrator as an emerging governance system that reshape coordination, control, and value creation evolve in increasingly data-driven, rather than a mere technologically enhanced orchestrator. As a consequence, the study contributes to the current innovation ecosystem theory by proposing positioning the digital orchestrator as a foundational concept for understanding how coordination, control, and value creation evolve in increasingly data-driven and algorithmically mediated IE. Furthermore, it opens a research agenda for empirically investigating how hybrid orchestration influences power, governance, and collaboration dynamics within IE.

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BRIDGING THE MIS IMPLEMENTATION GAP: CHANGE-ORIENTED LEADERSHIP AND TEAM REFLEXIVITY IN HEALTHCARE

Rashkovits, Sarit[1]; Erez, Miriam[2]

[1] Healthcare Systems Management, Yezreel Valley College, Yezreel Valley, Israel

[2] Faculty of Data and Decision Sciences, Technion – Israel Institute of Technology, Haifa, Israel

Keywords: management information systems, change-oriented leadership, team reflexivity, MIS implementation, healthcare management, performance feedback, team performance, digital transformation

Introduction

Organizations invest heavily in Management Information Systems (MIS) to enhance performance monitoring and improvement. Despite such investments, research demonstrates that providing performance feedback data alone often proves insufficient for performance improvement (Gabelica et al., 2014). This implementation gap—the disconnect between MIS provision and actual performance improvement—represents a critical challenge for healthcare organizations.

In healthcare settings, contemporary perspectives recognize that outcomes emerge from interdependent team processes rather than isolated individual actions. Yet the process through which teams translate performance feedback availability into performance improvement remains poorly understood. Drawing on goal-setting theory (Locke & Latham, 2019) and social information processing theory (Salancik & Pfeffer, 1978), we propose a first-stage moderated mediation model: MIS-enabled performance feedback availability enhances team performance through team reflexivity, but only when team leaders display change-initiating behavior.

Theoretical Framework and Hypotheses

Goal-setting theory suggests that in team settings, performance improvement requires adapting work strategies rather than merely increasing effort (Locke & Latham, 2019). Performance feedback may therefore improve performance only when teams use feedback information to reflect on and adapt their work strategies. Team reflexivity—the extent to which team members openly reflect on goals, strategies, and processes, and adapt them to current circumstances (West, 2000)—serves as this collective mechanism for strategy adjustment. Research demonstrates that team reflexivity enhances team performance across diverse settings (Le Blanc et al., 2024).

However, team reflexivity faces social-psychological barriers because it requires members to question existing practices and established routines (Morrison, 2011; Hackman, 2002). Team members rely on leader cues to determine whether reflexive behavior is appropriate and worthwhile.

Leaders who consistently demonstrate change-initiating behavior—persistently seeking improvement and challenging established routines—signal that reflection and adaptation are valued organizational behaviors (Salancik & Pfeffer, 1978). By signaling that questioning existing practices and adaptation are both valued and worthwhile, such leaders may reduce the social and psychological barriers associated with team reflexivity. Such leadership may be critical for enabling teams to engage reflexively with MIS data, thereby translating data access into performance improvement.

Method

We employed a quasi-experimental longitudinal design including all eligible primary healthcare clinic management teams within the largest district of a large healthcare organization. Fifty-six teams were measured at three time points over 18 months. At baseline, teams were naturally divided into high (n = 32) versus low (n = 24) feedback availability conditions based on organizational MIS implementation decisions, with no significant baseline differences in performance, clinic characteristics, or team leader characteristics. We implemented time-lagged measurements: team reflexivity and leadership were assessed at 14 months via surveys, and performance outcomes at 18 months via objective organizational records.

Team performance was measured using a composite diabetes care quality indicator based on HbA1c, LDL, and microalbumin testing rates. This composite provides a parsimonious and statistically stable measure of a central clinical domain on which teams received repeated MIS performance feedback. Team leader change-initiating behavior was rated by team members using an 8-item scale (Paglis & Green, 2002; $\alpha = .95$). Team reflexivity was assessed using a 5-item scale ($\alpha = .91$).

Analyses controlled for baseline team performance, allowing assessment of performance change over time.

Results

Moderated mediation analysis using Hayes's (2022) PROCESS macro supported both hypotheses. The interaction between feedback availability and leader change-initiating behavior significantly predicted team reflexivity ($B = 0.80$, $p < .05$, $R^2 = .15$). Simple slope analysis showed feedback availability positively related to reflexivity only when change-initiating behavior was high (+1SD: $B = 0.33$, $p < .01$), but not at average or low levels.

Team reflexivity significantly predicted subsequent team performance ($B = 0.02$, $p < .05$), contributing incremental variance beyond baseline performance ($\Delta R^2 = .05$, $p < .05$). In contrast, feedback availability alone did not significantly predict performance ($\Delta R^2 = .003$, ns), demonstrating data access without reflexive engagement proves insufficient for improvement.

The index of moderated mediation was significant ($B = 0.02$, 95% CI [0.002, 0.05]). The conditional indirect effect of feedback availability on performance via reflexivity was significant at high levels of team leader change-initiating behavior ($B = 0.02$, 95% CI [0.002, 0.05]), but not at average or low levels, confirming that feedback availability relates to performance only through team reflexivity under change-initiating leadership.

Originality and Value

This study explains the MIS implementation gap by identifying the leadership conditions under which performance feedback translates into team reflexivity and subsequent performance improvement. In doing so, it highlights that the value of MIS-enabled feedback depends not

only on data availability but also on team and leadership processes that enable teams to reflect on and adapt their work strategies.

Practical Implications

These findings identify change-oriented leadership as a critical factor in MIS implementation success. Organizations implementing performance management systems should recognize that technology provision represents an insufficient condition for performance improvement.

Healthcare organizations should integrate change-oriented leadership development into MIS implementation strategies. This integrated approach enables teams to engage reflexively with performance data, translating information access into sustained performance improvement.

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THE EMOTIONAL DIMENSION OF HEALTHCARE : ENHANCING PATIENT EXPERIENCES THROUGH EMOTIONAL INTELLIGENCE

Al Khoury, Grace[1]

[1]Department of Marketing, Paris School of Business, Paris, France

Keywords: Emotional Intelligence, EI/EQ, Emotional Intelligence Models, WLEIS, Individual Resilience, Patient Experience, Patient

Abstract

This paper adopts a theoretical approach to exploring the existing literature on emotional intelligence models and patient experience, taking individual resilience as a mediating variable. The main research question is: How does patients' emotional intelligence influence their heathcare experience, with resilience acting as a mediating variable? The goal of this paper is to examine the role of emotional intelligence and its effect on patients' experience as well as to explore the mediating role of resilience in shaping this relationship. This research tends to deepen our understanding of how emotionally intelligent patients: perceive, process and engage with their care, and how resilience mediates this dynamic. This paper is patient-centered. Findings will benefit healthcare providers to better understand, communicate, and empower patients through fruitful and effective engagements. To address the research question, the researcher adopted a quantitative research approach. This methodological choice was made to systematically explore and measure the relationship between emotional intelligence (EI) skills, resilience and patient experience variables, as well as to assess their combined effect on organizational performance within the healthcare sector. Specifically, the study aims to determine how these variables influence patient service quality, a critical factor in healthcare settings where empathy and effective communication play pivotal roles.

Introduction

The concept of emotional intelligence (EI) has been extensively explored across a wide range of disciplines, reflecting its broad relevance and impact. The focus of the researchers is to investigate the influence of emotional intelligence on the outcome, in various contexts. Emotional intelligence can be researched in the field of education, studying its impact on academic performance and classroom engagement, or in health care, by exploring is impact on the patient care quality and provider-patient communication, and even its effect on the effectiveness of teamwork and leadership in engineering and technical fields. Having high

emotional intelligence has proved to enhance interpersonal relationships, decision-making, and adaptive functioning, resulting in enhanced and effective outcomes on both levels, the individual and organizational.

A multicenter cross-sectional study was conducted by Jabour A.M. (2024) in 2023-2024, studying 134 chronic hemodialysis patients used in the Trait Meta-Mood Scale (TMMS-24) to measure EI – note that there are several ways to examine the level of emotional intelligence, however, TMMS-24 was chosen as the mean of evaluation of EI in this research – alongside the Kidney Disease Quality of Life-Short Form (KDQOL-SF). The study concluded that patients with higher emotional intelligence, can better interpret and regulate their emotions, leading to an enhanced physocological and resilience and eventually, a more positive subjective health outcome (Jabour, A.M., 2024; Masià-Plana, A. et al, 2024).

Patients with high emotional intelligence are more skilled and capable of interpreting and expressing their own emotional state, which makes communication more effective with their providers.

Although most existing literature review focuses on the emotional competencies of the health care provides (clinical), a research conducted by Assiri et al (2024) focused on the patients' perspective and have highlighted the role of emotional intelligence in patients in sustaining relational quality across platforms. Moreover, the research has found that using specific telehealth communication techniques, such as: sustained eye contact, the use of open-ended questions, and deliberate emotional acknowledgment, help in strengthening the positive effects of patient emotional intelligence on trust, rapport, and overall satisfaction with care.

One of the most critical aspects of the healthcare sector is the ability to connect with patients and build healthy relationships between providers and patients. Establishing positive relationships fosters loyalty, trust, understanding, and greater patient satisfaction – all of which are essential for creating a strong provider-patient experience. These factors play a pivotal role in ensuring the long-term sustainability and success of the healthcare businesses (Anshari & Almunawar, 2011).

Patients in the healthcare sector have significantly higher expectations compared to those in other industries. This places additional pressure and responsibility on the healthcare professional, making it even more challenging to maintain a consistently positive impression with every patient. It is cruicial to proactively address patients' needs and understand their

expectations, as doing so is far more cost-effective than reacting to issues after they rise (Anshari & Almunawar, 2011).

Research Gap

Researchers have found that the concept of emotional intelligence (EI) plays a cririca l role in enhancing employee performance in the service sector, including healthcare (Ansari et al., 2016). Therefore, to improve the performance of healthcare professionals by fostering a deeper understanding of their patients and building stronger relationships, developing emotional intelligence skills is essential.

Moreover, a number of research papers studied the patient-provider interactions, stating that the emotional dynamics of these interactions are still vague, in particular when in comes to the role of emotional intelligence of the patients. Bodonhelyi et al. (2025) highlighted the need to research and focus on the 'authentic' patient communication styles in healthcare. Understanding patients' emotional intelligence will lead to better and more effective digital health interventions. Although Bodonhelyi et al. (2025) focus of research was on digital health, the implication of this research can be implemented on all levels and types of healthcare patient-provider interaction.

In order to enhance patient interactions and healthcare experiences, a number of researchers focused on artificial intelligence (AI) and studied its effect in the healthcare field. However, a study by Nag et al. (2024) stated that AI tools often overlook the emotional intelligence of patients. Studies discussing the use of AI in the healthcare field, did not 'address' the role of patient emotional intelligence and how it can/should be used and integrated in those 'new' systems to enhance patient experience.

Alzahrani at al. (2023) conducted a research studying the interrelationship between emotional intelligence and medication adherence, in other words, how patients react to treatment plans when dealing with a chronic disease. The research showed a positive correlation between EI and the adherence to treatment plans, as a result of higher emotional regulation and stress management. However, there is a need for more empirical studies interlinking the level of emotional intelligence of patients to health outcomes, such as the acceptance of treatments, hence resulting in an enhanced healthcare experience.

In a research paper by Martins et al. (2022), emotional intelligence was linked to mental health. The study showed that the higher the emotional intelligence, the lower the anxiety and depression in cardiac patients. This will result in an improved patient experience in the

healthcare field. However, although this was tested and there was a positive correlation, Marins et al. (2022) suggested that there is a need for more empirical studies to unravel the role of emotional intelligence in patients, focusing on their physchological adaptation and the perceived quality of care offered during the treatment of a chronic illness.

Most research papers study the role of the 'providers' emotional intelligence on patient experience. Al-Omrani et al. (2024) chose to focus on the patients' emotional intelligence instead and proposed a framework for patient EI training. In their research, they noted that although there are a number of EI training programs, there is a 'critical lack' of evidence and interventions that aim to enhance patients' emotional intelligence and use it as a 'pathway' to better engagements with healthcare professionals/providers and improved health outcomes and experiences.

Having that said, there is a clear need for a research to examine the role of patients' emotional intelligence and its effect on their healthcare experience. Despite the growing recognition of emotional intelligence of healthcare professionals, there is a need to examine patients' emotional intelligence since they received comparatively little scholarly attention.

Researching patients' emotional intelligence and its influence on their interaction with healthcare professionals/providers, their level of acceptance and adherence for treatment plans, their ability to adapt and cope with illness, their overall satisfaction with the care provided, is indeed, a valuable insight that can benefit patients outcomes and experience. Through insights will be used in designing new strategies aligned with the emotional need of patients and ultimately improve the level of care delivered.

Research Questions

This study is guided by the following two primary research questions.

Is it necessary to study to what extent emotional intelligence enhances patients' experience in the healthcare field?

What key role does emotional intelligence play in this context?

Before answering the following questions, consider the two quotes below. These quotes aim to highlight how and why emotional intelligence plays not just a significant role, but a crititical one, in dealing with patients in the healthcare sector.

"When dealing with people, remember you are not dealing with creatures of logic, but with creatures of emotion." – Dale Carnegie

"People will forget what you said, people will forget what you did, but people will never forget how you made them feel." – Maya Angelou

This **research aims** to explore the interrelation between Emotional Intelligence (EI) skills and patient experience in the healthcare sector by investing the impact of emotional intelligence skills on individual resilence, as a mediator leading to better perceived experience.

Today it's important to examine the key role emotional intelligence play in enhancing patient experience in healthcare. To address this research question, this **research aims** not only to explore, but also to analyze, examine and study the interrelation between emotional intelligence and patient experience in healthcare sector. We are interested in the impact of individual resilience as a mediator leading to better patient perceived experience.

Theoretically speaking, the term 'Emotional Intelligence' refers to the ability to understand, manage, control and motivate oneself and others (Goleman, 2001). In other words, it involves recognizing and regulating emotions, ultimately leading to more effective decision-making (Ciarrochi & Mayer, 2001).

There has always been a debate about whether human emotions should be considered when conducting business or simply overlooked. Before highlighting the positive role of emotional intelligence in business, the prevailing belief for the last two millennia was that "emotions are in the way, they keep us from making good decisions, and the keep us from focusing" (Warner, J. 2010). Over the last three decades, a growing body of research has demonstrated that emotions are critical for thriving and succeeding in life. Overlooking them hinders progress, making emotional intelligence a fundamental building block for success (Freedman., 2004).

Emotional intelligence (EI) plays a vital role in the healthcare sector, as physicians' interpersonal skills are just as important as their clinical skills when dealings with patients. It is crucial to prioritize the psychological well-being of patients (Stratton et al., 2005). To overcome the prevalent anxiety and stress in the healthcare sector, it is recommended that both healthcare professionals and patients develop strong emotional intelligence skills (Kedadi and Bharamanaikar, 2020). It has been proven that there is a strong relationship between a physicians' emotional intelligence (EI) and the healthcare outcomes. However, further research is needed to explore this relationship as the concept continues to gain popularity in the medical profession. Studies emphasize the need to identify and understand the role of EI skills in the healthcare industry (Kedadi & Bharamanaikar, 2020).

Literature Review

To explore how patient's level of emotional intelligence affects their healthcare experience, it is essential to gain deeper understanding of emotional intelligence (EI). This includes examining its definition, the role of brain science in processing emotions, and the most commonly-used existing models.

Defining Emotional Intelligence

The term emotional intelligence was first coined by Salovey and Mayer in 1990, defining as the "ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide ones' thinking and actions". Whereas other researchers, such as Travis Bradberry and Jane Greaves, defined emotional intelligence in their book Leadership 2.0 (2012) as "the ability to recognize and understand emotions in yourself and others, and your ability to use this awareness to manage your behavior and relationships".

Emotional intelligence was later popularized by psychologist Daniel Goleman when he stated in the Harvard Business Review why emotional intelligence (EI) also known as emotional quotient (EQ) is more important that IQ when it comes to performance and success. Daniel Goleman have stated in his book (1995) 'Emotional Intelligence: Why It Can Matter More Than IQ' that "only 20% of people with high IQs are high performers in real life, while 80% of those with high Emotional Quotient (EQ) are high performers".

Emotional Intelligence Existing Models

Some might argue that there should be a single 'correct' emotional intelligence (EI) theoretical framework to be used, but this is not the case (Emmerling & Goleman, 2003). A variety of frameworks and models exit, each designed to serve specific purposes. Additionally, some researchers adapt existing EI frameworks by making modifications to create new models tailored to their research needs.

While numerous emotional intelligence theoretical frameworks and models exist, they generally fall under three main approaches:

1. Ability Approach – Proposed by Mayer and Salovey
2. Trait Approach – Associated with Reuven Bar-On
3. Mixed Approach – Popularized by Daniel Goleman

These approaches provide a comprehensive foundation for understanding and studying emotional intelligence in various contexts (Dhani & Sharma, 2016).

Mayer and Salovey proposed the only existing ability model of emotional intelligence , defining it as a form of pure intelligence consisting solely of cognitive abilities. In contrast, Reuven Bar-On's model emphasizes personality dimensions, focusing on the interdependence between the ability aspects of emotional intelligence, personality traits, and overall well-being. Meanwhile, Daniel Goleman introduced a mixed model which integrates noth abilities and personality traits, highlighting their combined impact on performance, particulary in the workplace (Dhani & Sharma, 2016).

Wong & Law Emotional Intelligence Scale (WLEIS)

One of the most popular EI self-report instrument is the WLEIS created by Wong & Law (2002). This scale relied on the four-branch ability model. The scale contains 16 items and 4 sub-scales, with 4 items.

Based on Wong & Law (2002, p. 4):"…we have used the Mayer and Salovey (1997) definition of EI as a set of interrelated skills concerning ''the ability to perceive accurately, appraise, and express emotion; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth'' (p. 10). Salovey and Mayer (1990) and Mayer and Salovey conceptualized EI as composed of four distinct dimensions:

1. Appraisal and expression of emotion in the self (self emotional appraisal [**SEA**]). This relates to the individual's ability to understand their deep emotions and be able to express these emotions naturally. People who have great ability in this area will sense and acknowledge their emotions well before most people.

2. Appraisal and recognition of emotion in others (others' emotional appraisal [**OEA**]). This relates to peoples' ability to perceive and understand the emotions of those people around them. People who are high in this ability will be much more sensitive to the feelings and emotions of others as well as reading their minds.

3. Regulation of emotion in the self (regulation of emotion [**ROE**]). This relates to the ability of people to regulate their emotions, which will enable a more rapid recovery from psychological distress.

4. Use of emotion to facilitate performance (use of emotion [**UOE**]). This relates to the ability of individuals to make use of their emotions by directing them towards constructive activities and personal performance."

There are a set of questions to be asked to measure the level of emotional intelligence at a later stage once the research needs to be conducted.

Having stated the dimensions used to study the patients' level of emotional intelligence, now comes the part to study 'how' does this level of emotional intelligence impacts patients' resilience and hence leading to a better patients' experience.

Resilience, in this paper, is considered as the mediating variable between emotional intelligence skills and patient experience.

Resilience

According to Luthar & Zelazo (2003), Masten & Cicchetti (2016) and Ungar (2012, 2018):

"…resilience is (1) not a trait, although several traits may be important predictors of positive adaptation after adversity, (2) dynamic, in that it changes over time, and (3) multisystemic, in that it develops transactionally across persons and social systems" (Miller-Graff, L.E., 2020, p. 660)

Before defining resilience, it should be noted that there are different types of resilience: individual, community and national. For this research paper, we will focus on individual resilience, also referred to 'multidimensional taxonomy of individual resilience – MTIR' which is defined as: "the individual's ability to maintain a stable level of functioning following traumatic events and as a trajectory of healthy functioning across time". (Bonanno, p. 2005, p. 136)

According to Miller-Graff (2020) to measure individual resilience one should study the 'sense of coherence', which is comprised of three interrelated components:

1. Sense of meaningfulness
2. Comprehensibility
3. Manageability

Measuring the sense of coherence (SOS) reflects how individuals 'perceive' things and the world and what they have been through as well as how they perceive those events; if they are controllable or not. It is a way to test to which extent are individuals able to cope and adapt to harsh events and their 'rate of recovery' from such distressing events and be able to maintain a balanced and 'normal' life. Studies have shown that individuals with higher resilience and more prone to deal with various health conditions. (Miller-Graff, 2020)

Duică et al. (2024) conducted a large-scale study in Saudi Arabia examining the interrelation between resilience and emotional intelligence and have found that there is a strong positive correlation indicating the emotional intelligence serves as a foundation for individuals to adapt resilience. A study in 2022 among Romanian healthcare professionals and have used resilience as a mediating variable. Findings showed that individuals with higher resilience are more prone to directly 'buffer' stress in heathcare settings, affirming that resilience and emotional intelligence are both essential for healthcare wellness.

In order to study resilience and its correlation with emotional intelligence as well as with patient experience, there is a need to use a 'scale'. Hence, comes the role of The Conner-Davidson 10-item scale, known also as the 'CD-RISC 10" and is considered as the 'golden scale' of resilience.

The two measures discussed up till now, WLEIS (Wong & Law Emotional Intelligence Scale) for emotional intelligence and CD-RISC 10 (Connor-Davidson Resilience Scale) for individual resilience, will guarantee the collection extremely reliable and valid results that will help in discussing and analyzing the correlation between EI and resilience. However, the aim of this study is to examine the effect of patients' emotional intelligence on their healthcare experience, having resilience as a mediating variable. Hence comes the discussion of the literature of patient experience, its' scales, and which to be used in this study.

Patient Experience

Wolf et al. (2014) described patient experience as the 'range of interactions' and engagements patients have with their healthcare system; which includes: health plans, nurses, doctors, hospitals and clinics staff.

Patient experience is, without a doubt, deeply shaped by critical factors. Research papers have found that emotional and environmental factors are the most critical when dealing with patient experience, as they are considered 'pivotal' in enhancing the quality of healthcare service offered, resulting in better healthcare outcomes and higher patient satisfaction since they will receive and 'perceive' a better service. Altringer (2010) showed that the 'design' of the healthcare spaces itself, psychologically speaking, lowers the patients' level of stress and anxiety, which improves the patients' perception of the quality of care received. Oweidat et al. (2024) focused on the interpersonal level, showing in their research that individuals with higher emotional intelligence, with focus on perception and regulation, tend to have better provider-

patient experience, as they are more prone to having better communication and engagement as a result of showing empathy towards one another.

Mao et al. (2021) supported those findings stating that emotional intelligence trainings offered to healthcare providers, do not just help those individuals in improving their resilience and lowers burnout, but also yields to better inpatient experience and those results were based on randomized clinical trials. Boulougari et al. (2024) showed that patients with her emotional intelligence are more skilled in communicating and engaging with their providers, ensuring a better care quality and outcomes as well as improved subjective wellbeing.

Codier at al. (2010) found that patients with high emotional intelligence will have a better patient outcome simply because they have a healthier engagement with their care providers and their own care. Sánchez-Gómez et al. (2020) also studied the level of patients' emotional intelligence, but focused on the 'trait' and had the same results, showing that the higher the trait emotional intelligence scored by the patient, the better the perceived quality leading to a more positive experience.

As for resilience, Wells et al. (2013) and Dunn et al. (2011) research papers have shown that having resilience helps patients to better cope with their anxiety, depression and illnesses. Resilience also leads to lower their level of distress, making their healthcare experience a 'satisfactory' one.

Hence, in order to attain the ideal patient experience, there is a scientific need for individuals with high emotional intelligence as well as high resilience to have healthy interactions and guarantee that the patient will 'feel' heard, cared for, supported and confident throughout their healthcare journey.

In order to study the correlation between emotional intelligence and patient experience, having resilience as a mediator, there is a need to measure the level of patient experience; hence, comes the need to choose the right measure that suits best this research paper.

PREMs are tools used to capture patients' experiences with healthcare services, focusing on aspects like communication, coordination, and responsiveness.

For the research paper, choosing PPE-15 is the best relevant fit that will allow patients to assess their experience in the healthcare sector without limiting the research to the context of 'hospitals' or 'clinics' or even to specific illnesses.

With the detailed discussion of the emotional intelligence skills, resilience, and patient experience in the literature review, the foundation in now established to formulate the research question and design the study effectively.

Hypotheses Development

The main **research question** is:

How does patients' emotional intelligence influence their heathcare experience, with resilience acting as a mediating variable?

The **goal** of this paper: to examine the role of emotional intelligence and its effect on patients' experience as well as to explore the mediating role of resilience in shaping this relationship.

Intention: This research tends to deepen our understanding of how emotionally intelligent patients: perceive, process and engage with their care, and how resilience mediates this dynamic. This paper is patient-centered. Findings will benefit healthcare providers to better understand, communicate, and empower patients through fruitful and effective engagements.

The following hypotheses, derived from the literature review, will be tested:

H1. Patients with higher levels of self-emotion appraisal (SEA) are more likely to demonstrate empathy during the healthcare process.

H2. Patients with higher levels of others' emotion appraisal (OEA) tend to recognize and respond to emotional cues more effectively, contributing to greater resilience in healthcare interactions.

H3. Patients with a higher 'use of emotions' (UOE) ability are more likely to harness their emotions constructively, enhancing their resilience throughout the healthcare process.

H4. Patients with higher emotion regulation (ROE) abilities are better equipped to manage their emotional responses, which contributes to improved resilience in the face of healthcare challenges.

H5. Patients with higher resilience levels are more likely to report a positive and satisfying healthcare experience.

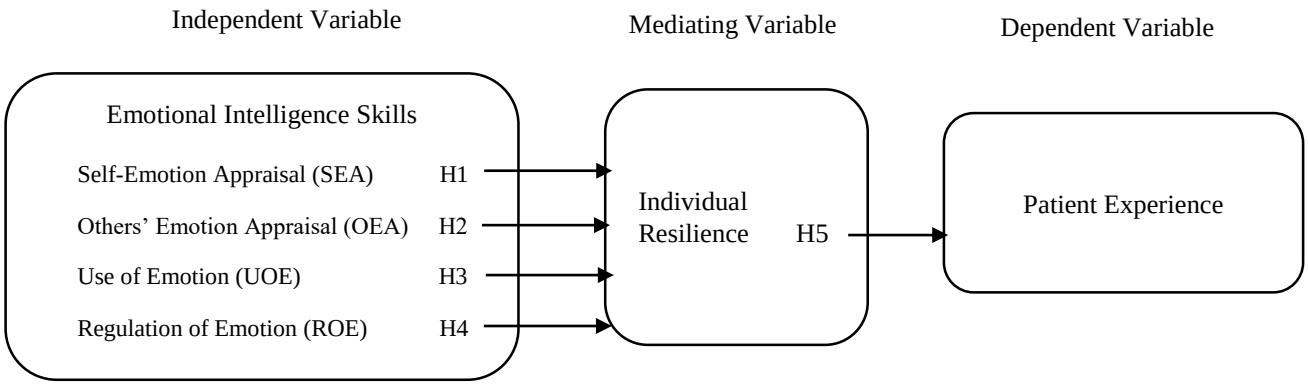


Figure 1: Conceptual Model to be tested (Author's Own Creation)

Research Methodology

To address the research question, *"How does patients' emotional intelligence influence their heathcare experience, with resilience acting as a mediating variable?"*, the researcher adopted a quantitative research approach. This methodological choice was made to systematically explore and measure the relationship between emotional intelligence (EI) skills, resilience and patient experience variables, as well as to assess their combined effect on organizational performance within the healthcare sector. Specifically, the study aims to determine how these variables influence patient service quality, a critical factor in healthcare settings where empathy and effective communication play pivotal roles.

Once the data collection is complete, the responses will systematically have inputted into SPSS software for statistical analysis. Through this process, correlations among the variables will be examined to identify relationships and patterns. To ensure robust findings, the researcher will continue gathering data until the study reaches maturity and consistent patterns emerge in the collected data. The final analysis will determine whether the proposed hypotheses are supported or rejected, providing valuable insights into the interplay between emotional intelligence, resilience, and patients' experience in the healthcare sector.

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AIRPORT OCCUPATIONAL HEALTH MANAGEMENT AND EMPLOYEE WELL-BEING IN SOUTH AND SOUTHEASTERN EUROPE: A CROSS-SECTIONAL MIXED-METHODS STUDY OF MUSCULOSKELETAL AND RESPIRATORY HEALTH

Marios Grigoriou[1], Cleo Varianou-Mikellidou[1], Paris Vogazianos[2], and Georgios Boustras[1]

1 Department of Computer Science and Engineering, European University Cyprus, Cyprus.

2 Department of Social and Behavioural Sciences, European University Cyprus, Cyprus

Keywords: Airport employees, occupational health management, respiratory health, musculoskeletal disorders, workplace interventions, airport policy, employee well-being, cross-sectional.

Introduction

Airport environments involve diverse occupational hazards associated with physical demands, ergonomic strain, shift work, operational pressures, and exposure to aircraft-related pollutants (Bulduk et al., 2017; Cavallo et al., 2006; Ganesan et al., 2018; Lecca et al., 2021; Møller et al., 2020; Ramlee et al., 2025; Stacey et al., 2020; Tafazzol et al., 2016; Tunnicliffe et al., 1999; Yang et al., 2003). Despite the economic importance of airports (Bevan et al., 2015), occupational health research remains limited and has largely focused on isolated occupational groups such as baggage handlers and maintenance personnel (Bulduk et al., 2017; Ramlee et al., 2025). Existing evidence suggests that airport employees may experience work-related musculoskeletal disorders (WMSDs), respiratory symptoms, and reduced health-related quality of life (HRQoL) (Bulduk et al., 2017; Ganesan et al., 2018; Tafazzol et al., 2016; Tunnicliffe et al., 1999; Yang et al., 2003), potentially affecting productivity, absenteeism, organisational performance, and workforce sustainability (Greggi et al., 2024; Smith et al., 2023).

Purpose, Aim and Objectives

This study investigated musculoskeletal and respiratory health outcomes among airport employees in South and Southeastern Europe and explored their implications for occupational health management. The objectives were to: (a) assess WMSD prevalence and respiratory HRQoL; (b) examine differences according to gender, occupational group, and work location; and (c) identify interventions that may improve workplace well-being and occupational health practices.

Literature Review and Theoretical Framework

The study was informed by occupational health management, ergonomics, and workplace well-being frameworks, suggesting that physical, organisational, and psychosocial exposures interact to influence employee health outcomes (Bulduk et al., 2017; Dobrowolska et al., 2020; Jing et al., 2023; Rau et al., 2020). Previous airport studies have reported elevated prevalence of neck, shoulder, and lower back disorders among baggage handlers and maintenance personnel (Bergsten et al., 2015; Ganesan et al., 2018; Ramlee et al., 2025), while studies investigating airport-related pollution have highlighted possible respiratory and cardiovascular risks linked to ultrafine particles and combustion-related pollutants (Cavallo et al., 2006; Møller et al., 2020; Tunnicliffe et al., 1999; Yang et al., 2003). Organisational factors, including workload pressures, limited ergonomic support, and insufficient occupational health services, may further affect employee well-being (Asadi et al., 2019; Bulduk et al., 2017; Nadeau et al., 2019; Ramlee et al., 2025). However, limited research has examined these issues across the wider airport workforce.

Methodology and Methods

A cross-sectional mixed-methods design was employed between February and May 2025 across airports in South and Southeastern Europe (Bryman, 2016). Due to confidentiality agreements, the names of airports and participating companies were not disclosed. The musculoskeletal component distributed questionnaires to 1,247 employees from 35 airport-related companies through internal company communication systems and onsite visits using a mixed-mode survey approach designed to improve participation and response quality. A total of 847 participants fulfilled the inclusion criteria and formed the final analytical sample (response rate: 68.8%) (Dillman et al., 2014). Employees working fewer than seven hours daily were excluded.

The respiratory component was conducted within the same survey population. Among respondents, 69 employees reported physician-diagnosed respiratory disease and completed the St George's Respiratory Questionnaire (SGRQ). Following exclusions according to SGRQ scoring guidance, the final respiratory sample included 65 participants (Jones and Forde, 2022).

Participants represented several occupational groups, including office staff, baggage handlers, passenger handling agents, operations employees, maintenance personnel, cleaners, dispatchers, warehouse employees, and airport operational staff. Musculoskeletal health was assessed using an adapted Nordic Musculoskeletal Questionnaire combined with a pain intensity scale (Antonopoulou et al., 2007; Ramdan et al., 2019), while respiratory HRQoL was assessed using the SGRQ (Jones and Forde, 2022). Statistical analysis was conducted using IBM SPSS Statistics version 30. Statistical analyses included descriptive statistics, chi-square tests, Mann-Whitney U tests, Kruskal-Wallis tests, ANOVA, general linear models, and multiple linear regression analyses.

The qualitative phase included 19 semi-structured interviews, one focus group involving seven health and safety practitioners, and consultations with human resources representatives (Bryman, 2016; Dillman et al., 2014). The qualitative findings were integrated with the quantitative results to contextualise airport environments, occupational groups, the effectiveness of existing interventions, workplace challenges, and other potential contributory factors.

Main Findings and Contribution

The most prevalent WMSDs were neck (49.7%), lower back (47.7%), and shoulder disorders (45.7%). Female employees generally reported higher symptom prevalence and pain intensity than males. Significant gender differences were observed for occupational groups, work locations, and several musculoskeletal body regions ($p < 0.05$). Employees working in physically demanding occupational groups, including baggage handling and maintenance operations, reported greater ergonomic strain and work limitations.

Respiratory findings showed that female employees reported significantly worse SGRQ Symptoms ($p = 0.038$), Impacts ($p = 0.019$), and Total scores ($p = 0.022$) than males. Although no statistically significant differences were identified between indoor and outdoor employees, moderate effect sizes indicated potential associations with occupational group, indoor working hours, physical exercise, and respiratory HRQoL.

Qualitative findings highlighted concerns regarding gender-related differences, age-related and biological susceptibility factors, pre-existing musculoskeletal injuries, workload pressures, inconsistent ergonomic awareness, and limited implementation of tailored occupational health interventions (Bajuaifer et al., 2025; Bergsten et al., 2015; Bryman, 2016; Kodete et al., 2024; Ma and Gao, 2025; Nogueira et al., 2012; Ramlee et al., 2025; Rasul et al., 2025; Schertzinger et al., 2018). Participants emphasised the importance of occupational physicians, ergonomic redesign, targeted training, and preventive measures.

Originality and Value

This study contributes to the limited airport occupational health literature by adopting a broader multi-occupational perspective integrating musculoskeletal, respiratory, and organisational dimensions. Unlike previous airport studies focusing on isolated occupational groups, the present research examined occupational health issues across the wider airport workforce.

Research Limitations

The study was limited by its cross-sectional design, self-reported data, lack of clinical confirmation of respiratory diagnoses, and underrepresentation of some occupational groups. Airport anonymity also restricted comparisons between operators and countries.

Theoretical and Practical Applications/Implications

The findings support the development of integrated occupational health management strategies within airport environments. Recommended interventions include ergonomic improvements, exposure reduction measures, occupational physician services, health surveillance, employee training, and workload management policies. Such approaches may improve employee well-being, reduce absenteeism, and support more sustainable airport workforce management.

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EXCELLENCE IN CHALLENGING TIMES: PERSONAL AND ORGANISATIONAL ANTECEDENTS OF INNOVATIVE BEHAVIORS AMONG NURSES

Gillie Gabay,[1] Ilya Kagan,[2] Sigal Shafran-Tikva[3]

1. Achva Academic College, School of Sciences, Arugot, Israel.

2. Ashkelon Academic College, Nursing, Ashkelon, Israel.

3. The Academic College of Law and Science, Margoa 5, P.O. Box 261. Hod Hasharon,

Keywords: EntrepreNuring; Innovations; Innovative Behaviors; Leadership; Locus of Control; Nursing; Perceived Organizational Innovativeness.

Introduction

Nursing innovations enhance healthcare quality, service accessibility, and systemic costeffectiveness. Frontline nurse-led innovations are vital for care, but innovative practices remain underutilized by frontline nursing professionals, and empirical research explaining the precise drivers of nurse-led innovation remains scant.

Purpose, Aim, and Objectives

Framed within the conceptual lens of *EntrepreNursing*, the strategic integration of clinical nursing expertise with entrepreneurial thinking, this study examined internal locus of control [ILOC], and personal capacity to innovate, alongside perceived organizational innovativeness as drivers of innovative behaviors among nurses.

Literature Review and Theoretical Framework

Anchored in Social Learning Theory (Rotter, 1975), individuals with a high ILOC attribute outcomes to self-directed actions and solve problems proactively. While ILOC traditionally reflected internal psychological agency, it has been shown in complex clinical environments to extend to an individual's capacity to mobilize available external resources (Gabay, 2015).

Empirical evidence indicates that nurses display only moderate levels of innovative behaviors (Thepna et al., 2023). Individual innovativeness among nurses was associated with positive attitudes toward evidence-based practice, sound clinical decision-making, and creative solutions to complex patient-care challenges (Erol et al., 2022). Although authentic leadership and managerial support are acknowledged facilitators of workplace innovation (Stilgenbauer and Fitzpatrick, 2019), the specific personal traits and climate that trigger innovative behaviors in frontline nurses require further empirical clarification.

Methodology and Methods

A cross-sectional study among Israeli nurses (80 hospital, 16% community) using a 62-item online questionnaire distributed via professional networks was performed A final sample of 205 registered nurses completed the survey, exceeding the sample size calculated via G*Power analysis (n=104). Measurement relied on established, validated instruments: ILCO (Rotter, 1975), Individual Capacity to Innovate (Hurt, Joseph and Cook, 1977), perceived organizational innovativeness (Hurt and Teigen, 1977) and innovative behavior (Scott and Bruce, 1994). Pearson correlation analyses and multiple linear regression modeling were performed. Variance inflation factor (VIF) tests confirmed the absence of multicollinearity.

Main Findings and Contribution

Nurses reported moderate levels of ILOC, personal capacity to innovate, and innovative behaviors. Conversely, perceived organizational innovativeness was rated as poor. Comparative analysis revealed that nurse managers exhibited significantly higher personal innovativeness and higher levels of innovative behaviors compared to nurses. Pearson correlations demonstrated strong, positive associations among ILOC, personal innovativeness, and innovative behavior ($p < .001$). Multiple linear regression analysis indicated that ILOC ($\beta = .37$, $p < .001$), personal capacity to innovate ($\beta = .50$, $p < .001$), and perceived organizational innovativeness ($\beta = .12$, $p = .018$) collectively explained 54% of the total variance in reported innovative behaviors ($R^2 = .57$, $Adjusted\ R^2 = .54$, $f^2 = 1.124$).

Originality and Value

This study extends existing knowledge by establishing the combined personal and organizational antecedents of innovative behaviors in nursing. By bridging individual psychology and organizational climate within the *EntrepreNursing* framework, the findings demonstrate that ILOC and a supportive organizational culture serve as crucial, mutually reinforcing catalysts for innovative behaviors.

Study Limitations

The design does not support a claim of causality; convenience sampling may influence the results and hinder generalizability; data from a single source may be subject to common method variance bias.

Theoretical and Practical Implications

Recommendations include enhancing ILOC through innovative hackathons, leadership empowerment, and strategic academic-industry partnerships.

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GENERATIONAL PERSPECTIVES IN SUSTAINABLE MARKETING: A BIBLIOMETRIC–SYSTEMATIC LITERATURE REVIEW OF CONSUMER BEHAVIOUR, BRAND AUTHENTICITY, AND TRUST

Sakka ,Georgia [1]; Theofanous, Giannis[2]; Voutsa, Maria[3]

[1]CIIM Business School, University of Limassol, Limassol, Cyprus
[2]School of Business, University of Nicosia, Nicosia, Cyprus
[3]Department of Communication and Marketing, Cyprus University of Technology

Keywords: baby boomers; bibliometric review; brand authenticity; consumer behaviour; ethical marketing; generation X; generation Y; generation Z; generational cohorts; generational differences; green marketing; greenwashing; millennials; scepticism; sustainability; systematic literature review; trust.

Sustainable marketing has evolved significantly over the past decade, transitioning from a primarily environmental communication tool to a broader strategic orientation encompassing ethical positioning, stakeholder expectations, consumer trust, and authenticity signalling. At the same time, increasing consumer awareness has initiated concerns about greenwashing practices, corporate credibility, and the authenticity of sustainability claims. While the literature on sustainable marketing and consumer behaviour has grown rapidly (Melanthiou and Voutsa, 2025), the intellectual structure of the field remains fragmented, particularly regarding how sustainability perceptions differ across generational cohorts and how these differences shape consumer responses to sustainability communication (Grimmer and Woolley, 2014; Peiró-Signes et al., 2025). Addressing this gap, this study adopts a bibliometric–systematic literature review (B-SLR) integrating bibliometric and co-citation analyses (via VOSviewer) of 83 peer-reviewed articles (2015–2025) from Scopus to identify dominant thematic areas, emerging research directions, and unexplored theoretical connections that can advance both academic understanding and managerial practice. The analysis of 83 peer-reviewed journal articles reveals nine major thematic areas structuring the field. The first and most dominant theme focuses on behavioural intention and decisionmaking models, which largely rely on established behavioural theories to explain sustainable consumption choices. A second theme explores persuasion, signalling, and green communication, highlighting how sustainability messages are constructed and interpreted by consumers. A third theme addresses greenwashing, scepticism, and environmental values, emphasising the risks associated with misleading sustainability claims and the resulting consumer distrust. A fourth theme examines authenticity, trust, and choice architecture, focusing on the mechanisms through which

sustainability claims are perceived as credible. Additional themes include the symbolic and experiential dimensions of sustainability in luxury consumption, the strategic integration of sustainability within marketing and CSR frameworks, sustainability challenges within fashion consumption systems, and the role of social influence and cross-generational learning processes. Finally, an emerging but still underdeveloped research stream connects sustainability with ethics, identity, and moral self-concept, highlighting the role of values and identity construction in shaping sustainable consumption. The review further demonstrates that while some relationships in the literature appear well established, particularly those linking behavioural intention models with sustainable consumption, other important connections remain fragmented. In particular, constructs related to authenticity, scepticism, and trust often appear as moderating variables rather than as central explanatory mechanisms. Similarly, generational differences remain under-theorised, as age is frequently treated as a demographic control variable rather than as a meaningful cohort factor shaping sustainability perceptions, values, and behavioural motivations. The findings suggest that younger generations, particularly Millennials and Generation Z, demonstrate stronger value alignment with sustainability, greater sensitivity to authenticity and transparency, and a stronger tendency to connect sustainability with identity expression. In contrast, older generations appear to prioritise functional value, product quality, and reliability, integrating sustainability considerations more selectively into their decision-making processes. By integrating these fragmented research dimensions, this study contributes to the literature by proposing a more coherent understanding of how generational identity may act as an important explanatory and exploratory mechanism connecting sustainability communication with consumer behavioural responses. At the same time, the review highlights important opportunities for future research, particularly regarding the role of ethical identity, intergenerational learning processes, and authenticity signalling in strengthening consumer trust. From a managerial perspective, the findings suggest that organisations should move beyond generic sustainability messaging and develop more targeted communication strategies that reflect the distinct values, expectations, and trust drivers of different generational cohorts (Papadopoulou, Papasolomou and Thrassou, 2022).

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SUSTAINABLE CIRCULAR STRATEGIES AND SHORT SUPPLY CHAINS AMONG SMALLHOLDER PRODUCERS: FIELD OBSERVATIONS FROM PERU'S AGROFERIAS CAMPESINAS

Vásquez Neyra, Jessika Milagros[1,2]

[1] Pontificia Universidad Católica del Perú, Lima, Peru

[2] CENTRUM Católica Graduate Business School, Lima, Peru

Keywords: Circular economy, Short supply chains, Smallholder producers, Field observation, Sustainability transitions, Inclusive markets

Introduction. The transition toward a circular economy has increasingly emphasized the role of localized production systems and short supply chains in promoting sustainability and resilience. In emerging economies, smallholder producers represent critical actors in advancing inclusive circular strategies. However, empirical evidence grounded in direct field observation remains limited, particularly in Latin American contexts.

Purpose and Objectives. This study aims to examine how smallholder producers participating in Peru's Agroferias Campesinas implement sustainable and circular strategies within short supply chains. The research seeks to identify (1) the circular practices embedded in local market dynamics, (2) the governance mechanisms enabling these practices, and (3) the challenges and opportunities for scaling inclusive circular models.

Literature Review and Theoretical Framework. Drawing on circular economy theory and sustainability transition frameworks (Geels, 2002), the study integrates perspectives on short food supply chains, inclusive markets, and stakeholder-driven sustainability. Existing literature highlights the environmental and social benefits of localized systems but often relies on interviews or secondary data. There is limited research incorporating structured field observation to capture real-time practices, informal coordination mechanisms, and embedded sustainability behaviors.

Methodology and Methods. The study adopts a qualitative case study design centered on Peru's Agroferias Campesinas. Data collection includes direct field observation across multiple market sessions, semi-structured interviews with smallholder producers and coordinators, and

document analysis. Field observation enabled systematic recording of production practices, waste management routines, packaging choices, logistics coordination, and consumer–producer interactions. Data were coded thematically to identify recurring patterns of circularity and governance dynamics.

Main Findings and Contribution. The findings reveal that circular strategies among smallholder producers are embedded in three interconnected dimensions. First, responsible production practices include reduced chemical inputs, seasonal crop rotation, and low-waste packaging solutions. Second, short supply chains facilitate direct producer–consumer interaction, minimizing intermediaries and enhancing transparency. Third, informal governance mechanisms—such as peer monitoring, trust-based coordination, and collective norms—support circular behaviors without heavy regulatory structures. These practices demonstrate how localized ecosystems can operationalize circular principles through social capital and relational proximity.

However, structural constraints remain, including limited access to digital tools, financial barriers to scaling, and regulatory inconsistencies. Despite these challenges, Agroferias Campesinas illustrate how community-based governance and stakeholder collaboration can foster environmentally responsible and socially inclusive supply chains.

Originality and Value. This study builds on prior empirical research examining circular strategies and resilient food supply chains among smallholder producers in Peru (Vásquez Neyra et al., 2025a; Vásquez Neyra et al., 2025b). While previous work identified structural practices and systemic challenges at the supply chain level, the present study advances the literature by incorporating structured field observation to capture micro-level governance mechanisms, relational coordination, and embedded sustainability practices within short supply chains. By moving from structural analysis toward grounded field-based evidence, this research deepens understanding of how circular strategies are enacted in practice and contributes to stakeholder-driven sustainability debates within emerging economy contexts.

Research Limitations. The study focuses on a single national context and selected market sites, which may limit generalizability. Future research could expand comparative analyses across regions and incorporate longitudinal designs.

Theoretical and Practical Implications. The findings refine sustainability transition frameworks by highlighting the importance of micro-level governance, trust-based coordination, and embedded community norms in circular implementation. Practically, policymakers and development agencies can support scaling by facilitating access to infrastructure, digital traceability tools, and institutional recognition of short supply chains as viable circular models.

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CIRCULAR ECONOMY AND TIMBER CONSTRUCTION: A CONCEPTUAL FRAMEWORK FOR PROMOTION STRATEGIES

Efstathiou, Eleni[1]; Papadopoulos, Ioannis[2]; Trigkas, Marios[2], Adamakis, Kostas[3]

[1]PhD Candidate, University of Thessaly, Department of Forestry, Wood Sciences and Design, 43100, Karditsa, Greece,

[2]Professor, University of Thessaly, Department of Forestry, Wood Sciences and Design, 43100, Karditsa, Greece,

[3]Emeritus Professor, University of Thessaly, Department of Architecture, 38334, Volos, Greece,

Keywords: Circular economy, timber construction, conceptual framework, architects and engineers, innovation adoption, sustainable construction.

Abstract

In recent years, the circular economy has emerged as a key policy and strategic framework for the sustainable transition of the construction sector, which is characterised by high resource consumption and a significant environmental footprint. Timber construction, due to the renewable nature of wood and its potential for reuse and life-cycle extension, offers important opportunities for integrating circularity principles. However, despite its well-documented environmental and technical advantages, the adoption of timber construction within a circular economy framework remains limited.

This paper addresses this gap by developing a conceptual framework for promoting the circular economy in timber construction. The study is based on a systematic review of recent international literature and a synthetic analysis of theoretical and empirical approaches related to the circular economy in the built environment, construction professionals, and innovation adoption processes.

The proposed framework is structured around three interrelated categories of factors: (a) external drivers, including institutional and regulatory conditions, economic mechanisms, and technological support; (b) internal dimensions of professional practice, encompassing the knowledge, skills, perceptions, and attitudes of architects and engineers as key stakeholders; and (c) the adoption of circular practices as the outcome. By emphasising the interaction between institutional conditions and professional practice, the study highlights the stakeholder-driven nature of sustainability-oriented business transitions and provides theoretical insights and practical directions for future empirical research and policy interventions.

Introduction

The transition towards sustainable development constitutes a major challenge for contemporary economies, with the construction sector at the centre of this debate due to its high levels of raw material consumption, energy use, and waste generation. In this context, the circular economy has emerged as a comprehensive model aiming to preserve the value of materials and resources while reducing the environmental impacts of economic activity.

The circular economy extends beyond conventional recycling by incorporating strategies such as circular design, reuse, life-cycle extension of materials, and waste valorisation. Its application in the construction sector can significantly reduce environmental impacts while improving economic efficiency and organisational resilience (Geissdoerfer et al., 2017; Pomponi and Moncaster, 2017). At the policy level, the circular economy has become a core priority within the European Union, as reflected in initiatives such as the European Green Deal and the Circular Economy Action Plan.

Within this framework, construction materials play a critical role. Wood, as a renewable and biodegradable material, aligns closely with circular economy principles due to its carbon storage capacity and potential for reuse and recycling, offering advantages over conventional materials such as concrete and steel (Leskinen et al., 2018; Gustavsson et al., 2021). Advances in modern timber construction technologies, including cross-laminated timber (CLT), have further expanded the applicability of wood in complex and multi-storey buildings.

Despite these advantages, the adoption of timber construction within a circular economy framework remains limited in many countries. The literature indicates that this is driven not only by technical constraints but also by institutional, organisational, economic, and cultural barriers, including regulatory frameworks, limited professional expertise, market acceptance, and the absence of coordinated promotion strategies (Harte, 2017; Markström et al., 2022). Similar patterns of fragmented and selective adoption have been observed even among leading firms, suggesting that sustainability transitions often remain confined to operational initiatives rather than integrated into broader business strategies (Trigkas et al., 2020).

These challenges highlight the need for integrated strategies that move beyond isolated practices and combine technological, policy-related, educational, and organisational dimensions. While existing studies provide valuable insights into circular economy principles, sustainable construction materials, and technological innovations, there remains a lack of synthetic conceptual frameworks that integrate these dimensions specifically in the context of timber construction (Kirchherr et al., 2017; Hart et al., 2021).

In response to this gap, the purpose of the present study is to develop a conceptual framework for promoting the circular economy in timber construction. Based on a systematic review of recent international literature and an analysis of dominant European policy directions, the study aims to map key theoretical approaches and strategies related to circular economy adoption in the construction sector, highlight the role of timber construction as a catalyst for circular practices, and synthesise critical strategic components that can support sustainable transition pathways and inform future empirical research.

Literature Review

Circular Economy in the Construction Sector: From Theory to Professional Practice

The circular economy has become firmly established in the international literature as a comprehensive framework for transitioning towards more sustainable and resource-efficient production and consumption patterns, particularly in resource-intensive sectors such as construction.

According to the literature, the circular economy seeks to preserve the value of materials and resources through strategies such as circular design, reuse, recycling, and the extension of the life cycle of buildings and construction systems (Kirchherr et al., 2017). In construction, these principles become operational through design decisions concerning durability, adaptability, disassembly and waste reduction.

Despite the broad theoretical acceptance of circular economy principles, their implementation within the construction sector remains uneven. The literature indicates that adoption is often limited to fragmented practices, rather than being embedded in comprehensive circular strategies at the project or organisational level (Hosseini et al., 2018; Adams et al., 2017).

This uneven implementation is linked to perceived cost barriers, limited specialised knowledge, uncertainty over long-term benefits and insufficient regulatory support (Markström et al., 2022; Rizos et al., 2016).

Overall, the literature shows that circular construction is shaped by the interaction between material strategies, professional practice and the institutional environment. Evidence from established firms also suggests that circular strategies often remain fragmented when they are not integrated into broader organisational strategies (Trigkas et al., 2020). This provides the basis for examining timber construction not only as a material solution, but also as a field of professional and organisational transition.

Wood as a Structural Material in the Circular Economy

Within the circular economy framework, wood is widely recognised as a structural material with strong potential to support sustainable and circular practices in the construction sector. Its renewable character, carbon storage capacity, and suitability for reuse and recycling align closely with circular economy principles. However, the effective circular utilisation of wood depends not only on its technical properties but also on the knowledge, perceptions, and professional practices of architects and engineers involved in design and construction processes. The literature provides robust evidence that timber construction can substantially reduce the environmental impacts of buildings through both material substitution and carbon sequestration (Leskinen et al., 2018; Gustavsson et al., 2021; Churkina et al., 2020).

A key dimension of circular timber construction is the potential for design for disassembly and component reuse. Prefabricated and standardised timber systems are especially conducive to extending building life cycles and reducing construction waste, provided that circular thinking is integrated at early design stages and supported by appropriate detailing and connection choices (Pomponi and Moncaster, 2017; Akanbi et al., 2019; Hart et al., 2021).

Despite these advantages, persistent concerns regarding fire safety, durability, maintenance, and regulatory compliance continue to influence professional and market acceptance of timber as a structural material, particularly in a circular context where long-term performance and reuse are critical (Harte, 2017; Markström et al., 2022; Hurmekoski et al., 2019).

Overall, the literature suggests that wood can act as a key enabler of circular economy implementation in construction when its technical potential is supported by adequate professional knowledge, institutional frameworks, and positive perceptions. Accordingly, the adoption of circular timber construction depends on the interaction between material advantages, professional confidence and institutional support.

Technological Enablers of the Circular Economy in Timber Construction

The implementation of the circular economy in the construction sector is closely linked to the adoption of technological tools that support integrated design, information management, and efficient material use across the building life cycle. Digital technologies are widely recognised as key enablers of the transition from linear to circular models, provided that they are systematically embedded in professional and organisational practice (Hart et al., 2021; Markström et al., 2022).

Building Information Modeling (BIM) plays a central role in this process, as it can support core circular economy principles such as design for disassembly, material traceability, and

documentation of building components, thereby facilitating future reuse and recycling (Eastman et al., 2018; Charef et al., 2018).

In the context of timber construction, technological progress is strongly associated with prefabricated systems and mass timber solutions, including Cross-Laminated Timber (CLT), which contribute to waste reduction, precision, and standardisation, enhancing the feasibility of circular practices (Hurmekoski et al., 2019; Churkina et al., 2020).

Life Cycle Assessment (LCA) represents a complementary tool that enables the quantitative evaluation of environmental impacts and supports informed decision-making at early design stages. Recent studies highlight that the combined use of BIM and LCA can strengthen the development of integrated circular strategies, especially in timber construction (Pomponi and Moncaster, 2017; Cabeza et al., 2014; Goh et al., 2023). In addition, emerging digital tools such as material passports enhance transparency and reuse potential by recording the properties and condition of building materials throughout their life cycle (Durmisevic, 2019; Munaro et al., 2023). However, the effectiveness of BIM, LCA, material passports and prefabricated timber systems depends on professional skills, organisational readiness and institutional support. Technology therefore constitutes a necessary but insufficient condition for circular transition, reinforcing the need to examine technological readiness within a broader strategic framework.

Barriers and Promotion Strategies for Circular Timber Construction

Despite the growing recognition of the circular economy as a key sustainability framework in the construction sector, the adoption of timber construction within a circular context remains limited in many countries. The literature attributes this outcome to the combined influence of institutional, economic, organisational, and socio-cultural factors that jointly shape barriers and opportunities for diffusion (Pomponi and Moncaster, 2017; Hart et al., 2021).

Regulatory and institutional constraints constitute a primary barrier, as building codes, fire safety regulations, and permitting procedures are largely based on conventional materials and linear construction logics, discouraging the wider application of timber systems, particularly in multi-storey and urban contexts.

Economic uncertainty, limited use of life-cycle cost assessment, lack of incentives, professional knowledge gaps and persistent risk perceptions further constrain adoption, even where modern timber systems are technically feasible (Adams et al., 2017; Harte, 2017; Hosseini et al., 2018; Markström et al., 2022; Rios et al., 2023).

Addressing these barriers requires a coordinated mix of institutional, economic, and educational strategies. Coherent regulatory frameworks, targeted incentives, and the integration of life-

cycle criteria into design regulations and public procurement can reduce uncertainty and support circular timber construction. In parallel, professional education, training, and organisational collaboration, supported by digital tools such as BIM, life-cycle assessment, and material passports, can facilitate the translation of circular principles into practice and strengthen stakeholder coordination (Rizos et al., 2016; Hart et al., 2021; Munaro et al., 2023). Overall, the literature suggests that promotion strategies should combine policy-driven, market-based, technological and educational interventions. This synthesis provides the direct foundation for the conceptual framework developed in the present study and is reinforced by evidence highlighting the role of institutional and knowledge-producing stakeholders in sustainability-oriented business transitions (Trigkas and Karagouni, 2023).

Conceptual Framework for Strategies Promoting the Circular Economy in Wooden Constructions

Purpose and Rationale of the Conceptual Framework

The international literature on the circular economy in the construction sector indicates that the transition from linear to circular models of production and consumption constitutes a multidimensional process that cannot be sufficiently explained through isolated technological or regulatory interventions (Pomponi and Moncaster, 2017; Hart et al., 2021). Although numerous studies examine individual aspects of this transition-such as materials, digital technologies, or institutional barriers-there remains a notable lack of integrated conceptual approaches capable of capturing the dynamic interactions among the factors influencing the adoption of circular practices in construction.

Particularly within the field of wooden constructions, the literature highlights a substantial potential for circularity, which often remains underexploited due to institutional, economic, and knowledge-related constraints (Markström et al., 2022). In this context, the present study proposes a framework that differs from more general circular construction models by focusing specifically on wooden constructions and by positioning architects and engineers as mediating actors between external conditions, technological tools and the adoption of circular practices (Adams et al., 2017; Hosseini et al., 2018).

Key Dimensions of the Conceptual Framework

Based on a systematic review of the literature, strategies for promoting the circular economy in wooden constructions emerge from the interaction of institutional, economic, technological,

and professional factors that jointly shape decision-making in design and construction processes (Pomponi and Moncaster, 2017; Hart et al., 2021). The institutional and regulatory framework plays a decisive role, as building regulations, fire safety standards, and sustainability policies can either enable or constrain the adoption of circular timber construction systems (Harte, 2017; Markström et al., 2022).

Economic mechanisms and incentives are equally critical, particularly the distinction between upfront investment costs and life-cycle cost considerations, which strongly influence the perceived feasibility of circular solutions, especially when supported by appropriate policy and financial instruments (Ghisellini et al., 2016; Rios et al., 2023). Technological support, such as BIM, life-cycle assessment, and material management systems, provides important enablers for circular practices; technology alone remains insufficient without organisational readiness and integration into professional decision-making (Eastman et al., 2018; Charef et al., 2018; Munaro et al., 2023).

Finally, the knowledge, skills, and professional readiness of architects and engineers significantly affect the integration of circular economy principles into design and construction workflows, while perceptions and attitudes related to safety, performance, and reliability continue to influence market acceptance of wooden constructions, often persisting despite strong empirical evidence of their environmental and technical advantages (Adams et al., 2017; Hosseini et al., 2018; Churkina et al., 2020; Markström et al., 2022).

Compared with broader circular construction models that mainly focus on material flows, technological tools or policy barriers, this framework emphasises the interaction between external conditions and professional practice in the specific context of wooden constructions (Pomponi and Moncaster, 2017; Hart et al., 2021; Markström et al., 2022). Its added value lies in positioning architects and engineers as the link between regulation, incentives, digital tools and the actual adoption of circular timber practices (Adams et al., 2017; Hosseini et al., 2018).

Dynamic Relationships and the Role of Professionals

The proposed conceptual framework is grounded in the assumption that the promotion of the circular economy in wooden constructions results from the combined interaction of the aforementioned dimensions rather than from the isolated effect of any single factor. The literature emphasizes that architects and engineers act as key “translators” of policies, technologies, and economic incentives into practical design and construction solutions (Pomponi and Moncaster, 2017; Hart et al., 2021). Decisions made at early design stages shape

the feasibility of circular strategies across the building life cycle, making professionals' attitudes and practices central to the adoption process (Markström et al., 2022).

The relationships among the framework dimensions are therefore not linear but mutually reinforcing. Regulatory clarity and economic incentives may increase professionals' willingness to consider circular timber solutions, while BIM, LCA and material management systems can make these options more visible, measurable and technically feasible (Eastman et al., 2018; Munaro et al., 2023; Rios et al., 2023). However, these external and technological factors influence adoption mainly through professional practice, since architects and engineers interpret regulations, evaluate costs and benefits, select design alternatives and communicate circular value to clients and other stakeholders (Pomponi and Moncaster, 2017; Hart et al., 2021; Markström et al., 2022).

Contribution of the Framework and Research Perspectives

The main contribution of this conceptual framework lies in synthesizing fragmented findings from the literature into a coherent model that highlights the interconnections among institutional, economic, technological, and human factors. While similar integrative approaches have been proposed to explain the circular economy in the built environment, they typically lack a specific focus on wooden constructions and on the role of professionals as key implementation actors (Pomponi and Moncaster, 2017; Hart et al., 2021).

The proposed framework may serve as a theoretical foundation for the development of research instruments and for future empirical validation of the relationships among its dimensions, thereby contributing both to academic debate and to the design of targeted strategies for promoting the circular economy in the construction sector. More specifically, the framework can guide the operationalisation of future empirical research by translating each dimension into measurable constructs, such as perceived regulatory support, economic feasibility, familiarity with BIM and LCA, professional knowledge, risk perceptions, and intention to adopt circular timber practices (Rogers, 2003; DeVellis, 2017; Hair et al., 2019).

Methodological and Theoretical Foundations

This study is positioned within an interpretive–pragmatist research paradigm, which is appropriate for examining complex socio-technical phenomena such as the circular economy in construction, where developments are shaped by institutional frameworks, professional perceptions, and socio-economic conditions (Creswell and Plano Clark, 2018). At the

theoretical level, the research draws on circular economy theory, which conceptualizes the built environment as a system of material and value flows, emphasizing reuse, life-cycle extension, and circular design principles (Kirchherr et al., 2017; Pomponi and Moncaster, 2017). In addition, insights from innovation adoption theories are incorporated, highlighting how the diffusion of new practices is influenced by professionals' perceptions, attitudes, and social contexts (Rogers, 2003).

Methodologically, the study adopts a qualitative, conceptual approach based on a systematic review and integrative synthesis of the international literature. This approach is particularly suitable for emerging research fields characterized by theoretical fragmentation and a need to consolidate dispersed findings into coherent analytical frameworks (Jabareen, 2009; Snyder, 2019). The development of the conceptual framework followed a structured synthesis process aimed at identifying recurring themes and key dimensions affecting the adoption of circular practices in wooden constructions (Pomponi and Moncaster, 2017; Hart et al., 2021).

At this stage, the study does not seek empirical hypothesis testing but focuses on theoretical grounding and the structured organization of critical factors identified in the literature. In a subsequent phase, the proposed framework may serve as a basis for empirical investigation, particularly through survey research targeting architects and engineers. Each dimension can be operationalised into measurable constructs, such as perceived regulatory support, economic feasibility, technological readiness, professional knowledge, risk perceptions and intention to adopt circular timber practices, enabling the examination of relationships among dimensions and the assessment of their relative importance (DeVellis, 2017; Hair et al., 2019).

Integration of the Conceptual Framework into Questionnaire Design

The proposed conceptual framework served as the primary theoretical reference for the design of the research instrument, ensuring coherence between the literature review, conceptual synthesis, and subsequent empirical investigation. Questionnaire development followed a structured process of operationalizing the framework's core dimensions into measurable variables, in line with established principles of scale development and quantitative research in the social and management sciences (DeVellis, 2017; Hair et al., 2019).

The external dimensions of the framework, namely institutional and regulatory context, economic mechanisms, and technological support, were captured through items examining the decision-making environment in which architects and engineers operate. This approach is consistent with the literature, which highlights the direct influence of regulations, financial

incentives, and available technologies on the adoption of circular practices in construction (Pomponi and Moncaster, 2017; Hart et al., 2021).

At the same time, the internal dimensions of the framework, relating to professionals' knowledge, skills, perceptions, and attitudes, were operationalized through Likert-scale items reflecting professional readiness and evaluative orientations toward wooden constructions and the circular economy. This emphasis on subjective perceptions aligns with innovation adoption theories, which stress that the diffusion of new practices largely depends on how they are perceived by the professionals responsible for their implementation (Rogers, 2003; Hosseini et al., 2018).

The adoption of circular practices in wooden constructions is conceptualized as the final outcome of the framework and is measured through items capturing both intention to adopt and self-reported implementation of circular strategies in design and construction. Distinguishing between intention and actual practice is considered critical in the literature, as it allows the identification of potential gaps between attitudes and professional behavior (Ajzen, 1991; Markström et al., 2022).

This alignment between the framework's dimensions and the questionnaire sections enables future empirical analysis of the relationships among institutional, economic, technological, and human factors. In a subsequent research phase, the framework can support multivariate techniques, such as factor analysis and structural equation modeling, to assess the relative importance of these dimensions in driving circular adoption (Hair et al., 2019).

Accordingly, the framework functions both as an interpretive model and as an operational foundation for future empirical research.

Figure 1 illustrates the proposed conceptual framework for promoting the circular economy in wooden constructions. The framework is structured across three interrelated levels. The upper level represents external factors shaping the decision-making environment: institutional and regulatory conditions, economic mechanisms, and technological support, which exert direct and indirect influences on professional practice. The central level captures the professional practice of architects and engineers as a mediating mechanism between external strategies and the adoption of circular practices, shaped by their knowledge, skills, perceptions, and attitudes. The lower level reflects the adoption of circular practices in wooden constructions as the outcome of these interactions, with directional arrows highlighting the dynamic relationships among levels and the pivotal role of professionals as key implementation agents.

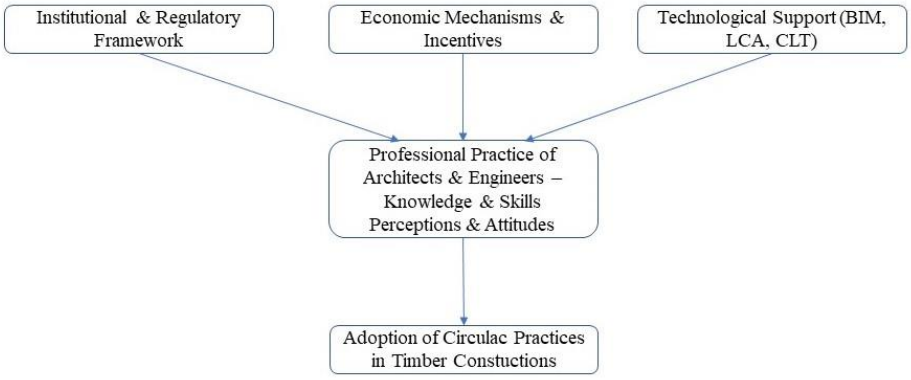


Figure 1. Conceptual framework for circular timber construction

Discussion and Conclusions

This study confirms, in line with international literature, that the promotion of the circular economy in wooden constructions constitutes a multifactorial and dynamic process that cannot be addressed through isolated technical or material choices. The transition from linear to circular construction models requires the combined interaction of institutional, economic, technological, and human factors (Pomponi and Moncaster, 2017; Hart et al., 2021).

Despite the well-documented environmental and technical advantages of wooden constructions, their adoption within a circular framework remains uneven and fragmented. The barriers identified extend beyond technological adequacy and include regulatory rigidity, economic uncertainty, limited professional readiness, and persistent risk perceptions regarding wood as a structural material (Harte, 2017; Markström et al., 2022). These findings reinforce the view that circular economy transitions in construction represent primarily a socio-technical challenge rather than a purely technological shift, as also observed in other sustainability-oriented business contexts (Trigkas et al., 2020).

Within this context, the proposed conceptual framework functions as a synthesising interpretive tool that highlights the central role of architects and engineers as mediators between external conditions, such as policies, regulations, markets, and technologies, and the practical adoption of circular strategies. Decisions taken at early design stages critically shape the feasibility of strategies such as design for disassembly, material reuse, and life-cycle assessment, underscoring the importance of professional knowledge, perceptions, and readiness (Adams et al., 2017; Hosseini et al., 2018). This emphasis differentiates the framework from broader circular construction models by focusing not only on material flows or technological enablers, but also on the professional actors who translate circular principles into design and construction decisions.

Technological enablers, including BIM, life-cycle assessment, and material passports, are shown to have significant potential to support circular economy principles in wooden constructions. However, their effectiveness depends largely on organisational readiness, professional competence, and institutional integration into design and decision-making processes, indicating that technology constitutes a necessary but insufficient condition for circular transition (Eastman et al., 2018; Munaro et al., 2023).

The main theoretical contribution of this study lies in the development of an integrated conceptual framework that synthesises fragmented insights from the literature into a coherent model for promoting the circular economy in wooden constructions. By adopting a dynamic perspective, the framework explains circular adoption as the outcome of interactions between external institutional, economic, and technological conditions and internal dimensions of professional practice, such as knowledge, skills, and perceptions (Hosseini et al., 2018; Hart et al., 2021). In this way, it offers a more actor-centred explanation of why circular timber practices remain unevenly adopted.

From a practical perspective, the findings highlight the importance of strengthening education and professional training in circular economy principles and wooden construction systems, with particular emphasis on the effective use of digital tools such as BIM and life-cycle assessment to support evidence-based design decisions (Eastman et al., 2018; Munaro et al., 2023). From a stakeholder-driven perspective, the results underline the need for coordinated action among businesses, policymakers, and knowledge institutions in order to strengthen sustainability and circular economy promotion strategies (Trigkas and Karagouni, 2023). At the policy level, coherent regulatory frameworks, targeted economic incentives, and effective knowledge-dissemination mechanisms are required to reduce professional uncertainty and enhance acceptance of circular solutions in the construction sector (Ghisellini et al., 2016; Rios et al., 2023). These implications may vary across national and regulatory contexts, since building codes, fire safety rules, public procurement criteria, certification systems and the maturity of timber construction markets can influence both professional acceptance and the diffusion of circular timber solutions.

Limitations and Directions for Future Research

This study is based on a systematic literature review and conceptual synthesis and does not include empirical validation at this stage, which constitutes a deliberate methodological limitation (Pomponi and Moncaster, 2017; Hart et al., 2021). Future research may apply the proposed framework in empirical studies, using quantitative approaches such as factor analysis

and structural equation modeling to examine architects' and engineers' perceptions and practices. More specifically, the framework could be operationalised through constructs such as perceived regulatory support, economic feasibility, technological readiness, professional knowledge, risk perceptions, and intention to adopt circular timber practices (DeVellis, 2017; Hair et al., 2019). Applying the framework across different institutional and geographical contexts could also enhance understanding of how building codes, fire-safety regulations, public procurement criteria, certification systems, and timber market maturity influence the adoption of circular practices in wooden constructions (Markström et al., 2022).

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FOSTERING REGIONAL COOPERATION THROUGH CROSS-BORDER TOURISM SUPPLY CHAINS

Folinas Dimitris[1]; Agapitou Chryssa[2]; Rotsios Konstantinos[1,3]; Mavridis Avraam[1]

[1]Department of Supply Chain Management, International Hellenic University, Katerini, Greece

[2]Department of Tourism Studies, University of Piraeus, Piraeus, Greece

[3]Anatolia American University, Thessaloniki, Greece

Keywords: Cross-border tourism, Short supply chains, Sustainable logistics, Tourism demand forecasting, Digital traceability

Abstract

Border tourism regions often face seasonality, fragmented logistics, limited producer access to tourism markets, and dependence on imported goods, reducing local economic benefits and increasing costs and environmental pressures. This study develops a conceptual, design-oriented cross-border short supply chain ecosystem connecting producers, tourism businesses, logistics providers, SMEs, service providers, and public authorities in two neighboring countries. Drawing on sustainable tourism, short supply chains, regional innovation systems, digital supply chain management, and circular economy principles, it addresses the lack of integrated approaches to these challenges. The model combines producer geo-mapping, AI-based tourism demand forecasting, low-carbon micro-distribution hubs, blockchain- and QR-supported traceability, and a Local Loop Index for sustainability monitoring, coordinated by a cross-border steering committee. The analysis suggests that the ecosystem can improve supply–demand alignment, procurement, inventory management, transparency, waste reduction, local sourcing, SME market access, resilience, and environmental performance. Its originality lies in integrating logistics, digital technologies, circularity, sustainability assessment, and cross-border governance within one tourism-focused framework. Future research should pilot the model and assess its economic, environmental, operational, and institutional impacts.

Introduction

Tourism has emerged as one of the largest and most dynamic sectors of the global economy fully rebounding from the pandemic to contribute approximately US$ 11.1 trillion to the global GDP in 2024, which represents roughly 10% of the total global economy (Dubakova, 2025). However, it faces several challenges. Amongst the most critical ones are the urgent sustainability pressures, particularly in regions with seasonal tourism demands and the over-reliance on imported goods (Gogonea et al., 2017). Coastal and island regions in particular, often struggle with logistical inefficiencies, limited market access, and fragmented cross-border trade, which undermine the efficiency and sustainability of tourism supply chains (Ranjitha et al., 2025). This research proposes the development of an integrated cross-border micro-supply-chain ecosystem that connects local producers with tourism destinations in an environmentally responsible and efficient manner. By leveraging advanced digital traceability tools, predictive analytics, and low-carbon micro-logistics solutions, the paper-seeks to develop and propose a short, efficient, and environmentally sustainable supply chain. Unlike conventional national supply chains, this transnational model fosters regional cooperation, promotes local production, and strengthens the sustainability credentials of tourism within cross-border regions.

Tourism Supply Chain Challenges and the Need for Regional Cooperation

Tourism in both coastal and inland areas is typically characterized by intense seasonality, geographic fragmentation, and a reliance on imported goods and services despite the availability of rich local resources. Seasonality remains a defining characteristic of tourism destinations, creating concentrated peaks and troughs in activity that limit economic expansion and underutilize facilities during off-peak periods (Alshuqaiqi & Omar, 2019; Baum & Hagen, 1999).

Moreover, tourism destinations often import a substantial share of the products and services used within the industry, leading to economic leakage and reduced local value capture even where strong local resources exist (Drakopoulos, 2011; Nowak, 2010). Producers in these regions often encounter difficulties such as fragmented logistics systems, limited market access, and a lack of coordination across borders, which significantly affect the efficiency of the tourism supply chain (Sifolo, 2020).

The hospitality sector also faces challenges, including unstable demand and supply, leading to an over-reliance on imports to meet the needs of hotels, restaurants, and resorts (Vu et al., 2025; Safaie, Nazeri and Mottakiani, 2025). This reliance increases operational costs, elevates environmental footprints, and compromises sustainability efforts (Mishra et al., 2024).

Moreover, geopolitical and environmental factors underscore the importance of developing innovative, low-carbon, and sustainable economic strategies to support local economies (Zhimeng et al., 2025). This study aims to address these challenges by developing a cross-border supply chain model that not only optimizes logistics but also promotes regional stability, economic diversification, and sustainable tourism practices (Wu & Ou, 2023).

Research Objectives

The primary aim of this research is to design and propose an integrated model for a short, cross-border supply chain ecosystem capable of effectively supporting and enhancing sustainable tourism in the two participating countries. The study seeks to conceptualize a collaborative and resilient framework that connects local producers, service providers, logistics actors, tourism enterprises, and public stakeholders across national boundaries, fostering economic, environmental, and social sustainability. By focusing on short supply chains, the model emphasizes proximity, reduced transportation distances, stronger local value creation, and closer relationships among stakeholders, all of which are aligned with the principles of sustainable regional development.

The key characteristics of the proposed ecosystem, along with the principal tasks required for its development and effective operation, are outlined as follows:

1. Mapping and profiling local producers. One of the first steps is to systematically map, classify, and profile local food producers, artisans, and agro-SMEs on both sides of the border. This detailed mapping will include data on product types, seasonal availability, logistical constraints, and sustainability practices. By creating a comprehensive geo-database of local producers, the project will facilitate the coordination between local producers and tourism businesses, ensuring the efficient sourcing of local goods while reducing dependence on imported products (Kaplan, 2020). This geo-database will also help businesses identify sustainable sourcing options and contribute to local economic growth by creating new market opportunities. Geographically referenced data enhances transparency and traceability in supply chains, enabling firms to locate eco-friendly suppliers, optimize procurement decisions, and strengthen linkages with local producers, which in turn can stimulate regional economic activity and sustainability (e.g., by promoting local products and fostering regional development through improved market access) (Khan et al., 2022). A similar approach is provided through the Caspian Policy Center (Figure 1).



***Figure 1**: An online map on cross-border supply chains (Source: Dayar et al., 2025)*

2. Estimating tourism demand. This task requires considering a number of factors, such as visitor flows, weather patterns and travel movements, to enable hotels, restaurants, and resorts to optimize procurement and ensure timely access to local products, while minimizing waste (Page & Connell, 2020). Accurate tourism demand forecasting helps businesses and destinations manage seasonal fluctuations in demand, improve overall supply chain efficiency, and reduce reliance on imported goods by aligning supply with anticipated visitor needs; such forecasting is essential for planning resource allocation, adjusting capacity, and designing strategies to meet changing demand patterns (Baker & Egger, 2019).
3. Another critical task is the design of the Local Loop Index (LLI). This index acts as a framework for measuring the sustainability of cross-border supply chains. It evaluates key factors such as carbon intensity, product freshness, local economic capture, and circularity within the supply chain (Saeed & Kersten, 2020). By offering a transparent and standardized metric, the LLI will allow tourism operators to assess and communicate the sustainability of their supply chains, thus promoting responsible sourcing practices and helping businesses align with sustainability certifications. It also serves as a valuable tool for consumers who are increasingly concerned with the environmental and social impact of their purchasing decisions (Jansson et al., 2018).
4. Establishing micro-distribution hubs. Micro-distribution hubs will be set up as modular logistics nodes that include cold storage, consolidation services, and low-carbon transport options (Katsela, 2022). These hubs serve as central points where local products can be stored and distributed to tourism businesses, ensuring efficient and timely delivery while reducing carbon emissions associated with transportation (European Commission, n.d.). By utilizing small boats, electric vans, and cargo bikes,

these hubs will offer a sustainable alternative to traditional trucking routes, which often contribute to congestion and environmental degradation in coastal and island regions (Barrett & Vassallo, 2020). This innovative approach will help streamline the movement of goods while promoting low-carbon logistics.

5. Integrating digital traceability systems: To enhance transparency and build consumer trust, the research will integrate digital traceability tools such as blockchain and QR-based systems into the supply chain (Tian, 2016). These systems will allow tourists and businesses to track the origin, production process, and environmental impact of the products they purchase (Kouhizadeh & Sarkis, 2018). By offering detailed insights into each product's journey (from the producer's story to the sustainability metrics) these tools will empower consumers to make more informed purchasing decisions and foster a greater sense of authenticity and trust in the supply chain (Gianotti et al., 2020).

Cross-Border Sustainable Tourism Supply Ecosystem Model

The following diagram illustrates a cross-border socio-technical regional innovation system that operationalizes sustainable supply chain principles through short supply chain structures and collaborative governance, enabled by digital technologies (Figure 2).

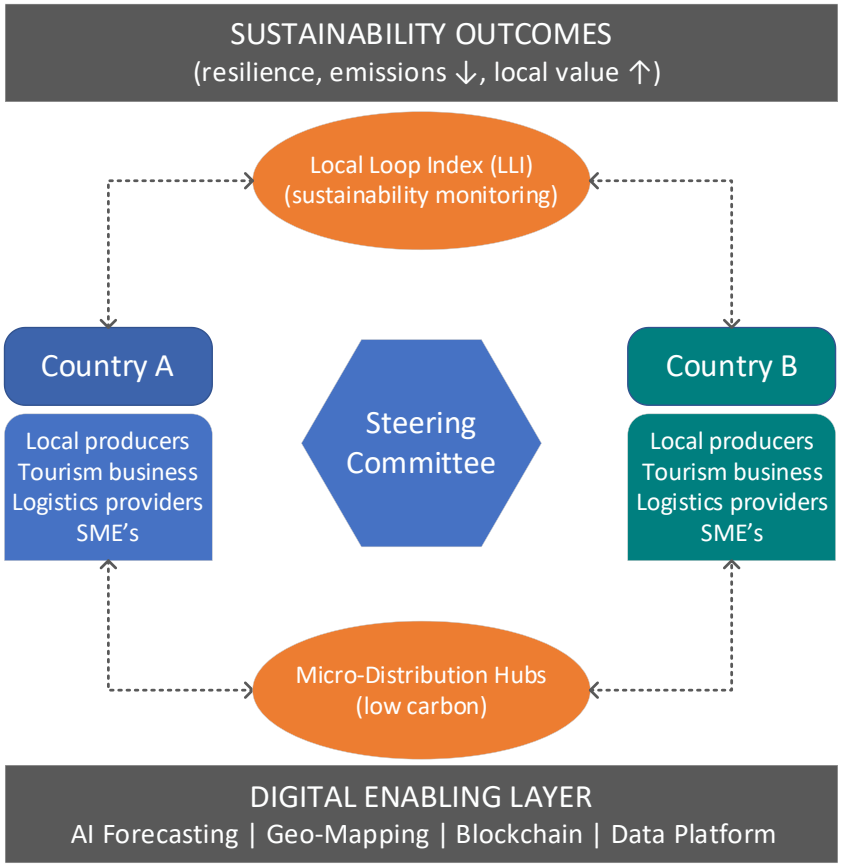


***Figure 2**: Cross-Border Sustainable Tourism Supply Ecosystem Model*

This above proposed model presents a digitally enabled, cross-border regional socio-technical supply ecosystem designed to strengthen sustainability, resilience, and local value creation in tourism-related supply chains. Its primary aim is to reorganize how goods flow between local producers and tourism businesses across two neighboring countries, shifting from import-dependent, fragmented systems to coordinated, short, and low-carbon supply networks governed collaboratively and monitored through sustainability metrics. At the highest level, the system seeks to reduce emissions, enhance regional economic multipliers, improve supply chain resilience, and increase the share of locally sourced products.

At the core of the ecosystem are the actors in the two countries. On both sides of the border, local producers, tourism businesses (such as hotels and restaurants), logistics providers, and SMEs form the social and economic base of the system. These actors represent the productive and demand sides of the tourism supply chain. Their interaction is not isolated within national boundaries; instead, they are connected through cross-border flows of goods and information, supported by shared infrastructure and governance structures.

Between these national actor groups operates the micro-distribution hub layer, which constitutes the main physical logistics interface. These hubs consolidate products from local producers, provide storage (including cold-chain capacity), and distribute goods to tourism enterprises using low-carbon transport solutions. By shortening distances and improving coordination, the hubs reduce transport emissions, fragmentation, and waste, while enabling smaller producers to access tourism markets more effectively.

Overseeing the entire system is the cross-border Steering Committee, which represents the collaborative governance mechanism. This body coordinates rules, standards, and strategic decisions between the two countries, ensuring alignment of policies, data sharing, and operational practices. It connects institutional actors with market participants and enables joint management of the ecosystem.

The Digital Enabling Layer underpins all components. Tools such as AI-based demand forecasting, producer geo-mapping, blockchain-enabled traceability, and a shared data platform enhance transparency, predictability, and coordination. These technologies link social actors with technical systems, enabling real-time information flows that optimize procurement and logistics decisions. Surrounding and monitoring the system is the Local Loop Index (LLI), which functions as a sustainability control mechanism. LLI evaluates factors such as carbon intensity, local sourcing, and circularity, feeding performance information back into the system. Together, these interconnected layers drive the overarching sustainability outcomes shown at the top of the diagram.

Innovative Aspects of the Research

This research introduces several innovative aspects that set it apart from traditional supply chain models. The most notable innovation is the development of the first cross-border short supply chain model for tourism, which links producers across national borders to create a collaborative supply chain ecosystem. Additionally, the project incorporates maritime micro-logistics solutions, which reduce reliance on road transport and minimize carbon emissions associated with the transportation of goods. The integration of circular supply loops that recycle waste into new value chains, such as composting, biogas, and upcycled packaging, is another key innovation. This ecosystem also fosters a bi-national governance system, with a cross-border steering committee that will oversee the development and management of the supply chain model, ensuring that all stakeholders are represented and that decisions are made collaboratively (Badulescu et al., 2014; Singh & Chandra, 2025). By leveraging technologies such as AI, blockchain, and IoT, this local supply chain ecosystem will optimize supply chain management, improve demand forecasting, and enhance traceability, supporting the goals of sustainable tourism (Timmermans et al., 2020).

Expected Impact and Contributions

The analysis demonstrates that the development of a localized, cross-border supply chain ecosystem between two neighboring countries can generate substantial benefits for the sustainability, resilience, and competitiveness of the tourism sector, while developing further collaborating partnerships and bilateral projects with further perspectives in the targeted sectors. An example is the Interreg Hungary-Slovakia project “InterregHUSK” on Short Supply Chains, (interreghusk.eu, n.d.). Rather than being limited to theoretical implications, the proposed ecosystem model produces a set of practical and technological contributions that illustrate how regional cooperation and short supply chain structures can transform tourism-related logistics and sourcing practices.

First, the establishment of a geo-database of local producers emerges as a foundational component of the ecosystem. Such a geo-referenced information system enhances visibility of regional production capacity and enables tourism operators to make more informed sourcing decisions. By systematically mapping local suppliers, the system reduces dependency on imported goods, shortens supply distances, and strengthens linkages between tourism businesses and local economies. This contributes not only to reduced environmental impact but

also to local value creation, income diversification, and the stimulation of small and medium-sized enterprises in rural and border regions.

Second, the integration of an AI-driven tourism demand-forecasting platform significantly improves the alignment between supply and demand. By incorporating variables such as visitor flows, seasonal patterns, and mobility trends, predictive tools allow hotels, restaurants, and resorts to optimize procurement planning. The expected outcomes include lower levels of food and product waste, more efficient inventory management, and reduced emergency sourcing from distant markets. This data-driven coordination enhances supply chain efficiency while simultaneously supporting environmental sustainability through minimized overproduction and transportation emissions.

A further key contribution is the development of a Local Loop Index (LLI) certification framework, which functions as a structured mechanism for assessing the sustainability performance of tourism supply chains. The LLI provides measurable criteria related to local sourcing intensity, environmental footprint, and socio-economic contribution. By offering a transparent evaluation tool, the framework supports responsible sourcing practices and encourages businesses to increase the proportion of locally sourced goods. In doing so, it strengthens accountability, facilitates benchmarking, and fosters trust among stakeholders, including consumers, suppliers, and policymakers.

The implementation of micro-logistics hubs represents another important operational outcome. These modular nodes, equipped with consolidation services, cold storage, and low-carbon transport options, demonstrate how localized distribution infrastructures can support short supply chains. Their role in aggregating goods from local producers and distributing them efficiently to tourism establishments reduces transport fragmentation, traffic congestion, and emissions. Moreover, the pilot application of such hubs provides a scalable model for other cross-border regions facing similar logistical constraints, particularly in areas with dispersed production and seasonal tourism demand.

Equally significant is the integration of a digital traceability system, which enhances transparency across the supply chain. Through technologies such as block chain and QR-based interfaces, stakeholders and end consumers can access reliable information regarding product origin, handling, and sustainability attributes. This increased visibility reduces information asymmetry, combats greenwashing risks, and strengthens consumer confidence in local and sustainable products. For tourism destinations, such transparency contributes to reputation building and differentiation in increasingly sustainability-oriented markets.

Beyond these core components, the study also highlights broader systemic benefits. The ecosystem supports capacity building among local producers and tourism enterprises by promoting knowledge transfer, digital adoption, and improved logistics practices. It also offers a replicable governance and coordination model for cross-border sustainable supply chains, demonstrating how institutional cooperation between neighboring countries can overcome administrative and market barriers. Such insights provide a basis for policy development aimed at integrating regional economic planning with sustainability and tourism strategies.

Overall, the findings indicate that a coordinated, technology-enabled local supply chain ecosystem can simultaneously enhance economic resilience, reduce environmental pressures, and improve transparency and efficiency in tourism supply networks. The cross-border dimension further amplifies these benefits by expanding market access, fostering regional cohesion, and creating shared value between neighboring countries.

Conclusion

This research advances the discourse on sustainable tourism logistics by moving beyond incremental efficiency improvements toward the conceptualization of a digitally enabled, cross-border socio-technical supply ecosystem tailored to tourism-dependent regions. Rather than treating supply chain optimization, sustainability, and regional cooperation as separate objectives, the study integrates them within a single systemic framework that links producers, tourism enterprises, logistics actors, technologies, and governance institutions across national boundaries. In doing so, the paper contributes a structured model for reconfiguring tourism supply systems from fragmented, import-dependent structures into coordinated, short, and low-carbon regional networks.

The proposed Cross-Border Sustainable Tourism Supply Ecosystem Model demonstrates how sustainability transitions in tourism supply chains require the simultaneous alignment of social actors, physical logistics infrastructure, digital technologies, and governance mechanisms. At the operational level, micro-distribution hubs shorten physical distances and enable low-carbon last-mile delivery, directly addressing emissions, congestion, and waste. At the informational level, AI-based demand forecasting and geo-mapping reduce uncertainty and seasonality-driven inefficiencies by synchronizing supply with tourism demand. At the transparency level, digital traceability tools enhance trust, accountability, and informed consumption. These technological layers are not standalone solutions; they function as enablers within a broader socio-technical system shaped by cross-border collaboration.

A central contribution of the model is the introduction of the Local Loop Index (LLI) as a sustainability control mechanism. By embedding performance monitoring within the ecosystem, the LLI transforms sustainability from an abstract objective into a measurable and comparable operational parameter, guiding sourcing decisions, certification processes, and policy evaluation. This closes the loop between data, governance, and practice, ensuring that environmental and socio-economic outcomes, such as reduced carbon intensity, higher local value capture, and increased circularity, are systematically reinforced.

Importantly, the cross-border Steering Committee institutionalizes collaborative governance, demonstrating how regional innovation systems can overcome administrative fragmentation and market barriers. The model thus illustrates that resilient tourism supply chains depend not only on logistics redesign but also on shared institutional frameworks and digital integration.

Overall, the study offers a replicable blueprint for sustainable regional tourism development, showing that localized, technology-enabled supply ecosystems can enhance resilience, reduce environmental pressures, empower SMEs, and strengthen regional cohesion. The framework provides both a theoretical contribution to sustainable supply chain and regional systems literature and a practical pathway for policymakers and destination managers seeking to operationalize cross-border sustainability transitions in tourism.

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AN INNOVATION INTELLIGENCE MODEL: INTEGRATING INTERNAL COGNITIVE RESOURCES, DYNAMIC CAPABILITIES, AND ORGANIZATIONAL ROUTINES

Georgios Afxentiou[1]

[1] Georgios Afxentiou Research Laboratory, Larnaca, Cyprus

Keywords: Innovation, internal cognitive resources, capabilities, routines, innovative behavior.

Abstract

This conceptual study explores how entrepreneurs' internal cognitive resources, including creative, critical, and strategic thinking, shape innovative behaviour in business environments. Addressing the theoretical gap between the dynamic capabilities and organizational routines theories in examining innovative behavior, the study proposes an innovation intelligence (II) model. Drawing on a conceptual synthesis approach, the researcher develops a conceptual framework, reflecting diverse ways of thinking about the research theme and prior literature review. The analysis demonstrates how internal cognitive resources enable strategic and digital capabilities while deploying organizational routines to formulate innovative behaviour. A theoretical and practical framework presents the dynamic relationships of the main research constructs.

Introduction

Innovation intelligence empowers entrepreneurs to identify, develop, and pursue emerging opportunities that drive innovation, organizational growth, and competitiveness. The radical changes in market conditions create an uneven competitive environment, requiring strategic and agile management. This study examines how entrepreneurs' internal cognitive resources, including creative, critical, and strategic thinking, enable dynamic capabilities through organizational routines, thereby facilitating innovative behavior.

The objectives are:

1. To explore how entrepreneurs' creative, critical and strategic thinking build organizational strategic and digital capabilities.

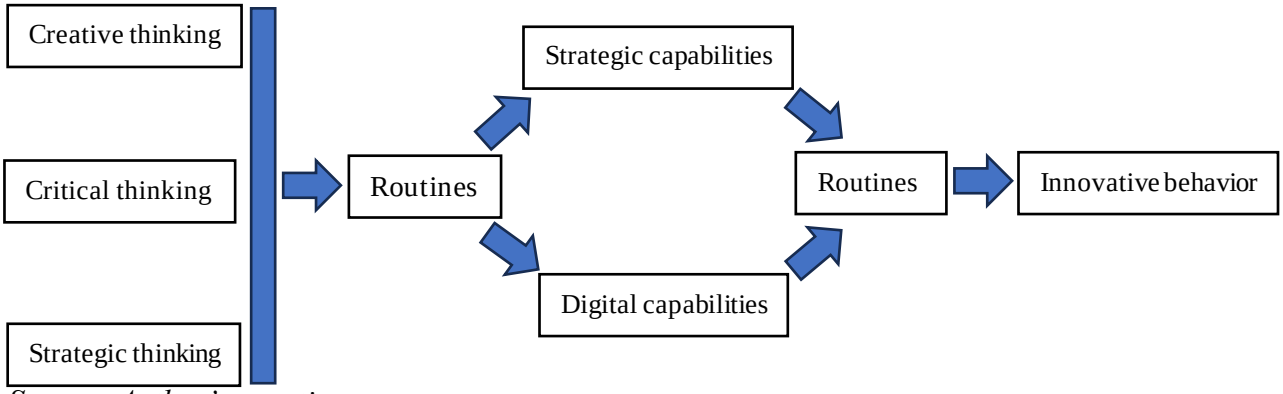
2. To examine how organizational routines enhance entrepreneurs' internal cognitive resources and capabilities for innovative behavior.

Research gap

The dynamic capabilities theory describes how dynamic capabilities balance the exploitation of existing competencies with the exploration of new opportunities (Nayernia, 2025). In contrast, the organizational routines theory examines how the internal dynamics of routines connect inputs with outputs and facilitate the emergence of practices in organizations (Feldman & Orlikowski, 2011). However, neither theory addresses how entrepreneurs' internal cognitive resources shape innovative behavior through the leveraging of capabilities and routines, revealing an emerging theoretical gap.

Literature review and theoretical framework

Innovation is defined as the creation or adoption of an object or practice (Nasiri et al., 2023; Rogers, 1983). The utilization of resources and implementation of routines in organizations enhances innovative behavior. This study draws on dynamic capabilities and organizational routines theories to develop a theoretical framework explaining innovative behavior. Dynamic capabilities theory highlights the significance of specialized capabilities in supporting organizations' adaptation to a rapidly changing environment (Teece, 2014; Teece et al., 1997). Organizational routines emphasize their role in connecting inputs and outputs within organizations (Feldman & Orlikowski, 2011). Although, dynamic capabilities enhance an organization in sensing, seizing, and transforming opportunities, the organizational routines facilitate the process in building creativity. Moreover, entrepreneurs' creative, critical and strategic thinking enable organizational capabilities to develop innovative behavior through routines. The **Innovation Intelligence (II) model** presents the relationship of internal cognitive resources, capabilities, routines, and innovative behavior.



Source: Author's creation

Thus, this study aims to answer the following research questions:

1. How does entrepreneurs' creative, critical, and strategic thinking enhance organizational strategic and digital capabilities?

2. How do organizational routines enable entrepreneurs to foster innovative behavior?

Methodology and methods

This study employs a conceptual synthesis approach to construct an integrative explanatory framework for innovative behavior in entrepreneurial contexts. Conceptual synthesis is appropriate when there is fragmented research, and particularly where theories do not address the phenomenon under investigation (Torraco, 2016). Instead of testing a hypothesis, this study systematically reviews and integrates insights from the literatures on entrepreneurial cognition, dynamic capabilities, organizational routines, and innovation behavior. By synthesizing these streams of literature, the study changes the focus from comparing theories to advancing theory development.

Expected findings and contribution

The findings provide both a theoretical and practical framework for understanding entrepreneurial cognition and innovative behavior, while emphasizing the significance of capabilities and routines within organizations.

Originality and value

The study's originality is grounded in explicating how capabilities are developed through routines to cultivate innovative behavior within organizations.

Research limitations

An empirical testing of the variables could provide valuable insights about innovative behavior within organizations.

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HOW PROXIMITY SHAPES INNOVATION: THE CONTINGENT ROLE OF BUSINESS MODELS

Massacci, Alberto[1]; Pucci, Tommaso[1]; Benvenuti, Caterina[2]; Zanni, Lorenzo[1]

[1]Department of Business and Law, University of Siena, Siena, Italy

[2]Department of Economics and Management, University of Florence, Florence, Italy

Keywords: Proximity, Business Model, Product Innovation, Process Innovation.

Introduction

Innovation lies at the heart of organisational evolution and firms' competitive advantage. Within the innovation context, the concept of proximity, spanning geographical, social, and cognitive dimensions, has been studied over the years in various disciplines and continues to attract the attention of top management journals (Chu et al., 2019, Crescenzi et al., 2016). Nevertheless, while the literature has largely discussed the linkage between proximity and innovation (Boschma, 2005, Janssen et al., 2020), the relation between proximity and business model design (Amit and Zott, 2015; Delorme, 2023;) and the importance of business model in shaping firms' innovation capacity (Hu and Chen, 2016, Massa et al., 2017), the underlying mechanisms through which the three variables interact still deserve attention.

Purpose, Aim and Objectives

This study attempts to fill this literature gap by empirically analysing the linkage between proximity, innovation and business models. In particular, the research attempts to understand whether the business model configuration could act as a mediating variable between partners' proximity and their ability to innovate, either from a product or process perspective.

Methodology and Methods

The empirical analysis is conducted on a database of 457 Tuscan firms that were interviewed between June 2020 and January 2021.

To assess whether business model characteristics mediate the relationship between proximity dimensions and innovation outcomes, we conducted a mediation analysis using nonparametric bootstrap procedures. Indirect effects were estimated as the product of path coefficients and evaluated using percentile-based confidence intervals obtained from 200 bootstrap replications.

Findings and Contribution

Results show that the indirect effects of social proximity on both product and process innovation through business model characteristics are not statistically significant. In both cases, the percentile-based confidence intervals include zero, indicating the absence of a robust mediation effect.

In contrast, cognitive proximity exhibits a significant indirect effect on innovation outcomes through business model characteristics. The indirect effect on product innovation is positive and statistically significant. A similar pattern emerges for process innovation.

Geographic proximity, measured as the share of partners located in the same municipality, shows a negative indirect effect on product innovation through business model characteristics. The indirect effect on process innovation is negative but not statistically significant.

Overall, these findings indicate that business models act as a selective mediation mechanism: while cognitive proximity fosters innovation primarily through business model configurations, social proximity operates through direct channels, and geographic proximity may constrain innovation via business model lock-in.

Originality and Value

The results offer interesting theoretical and managerial insights. From a theoretical perspective, they highlight that proximity cannot be defined as a homogeneous driver; indeed, different proximity dimensions activate distinct mechanisms. In addition, they show that business models act as selective mechanisms that transform relational inputs into innovation output only under specific cognitive conditions.

Theoretical and Practical Applications and Implications

Finally, the negative relationship between geographic proximity and innovation, through the business models, highlights the risks of regional lock-in and path dependence. From a managerial standpoint, the findings emphasise that proximity per se does not guarantee innovation. While social proximity helps build relationships, it does not automatically translate into structured innovation; similarly, cognitive proximity must be actively governed rather than left to emerge naturally. Furthermore, managers should be warned against the risks of excessive localism. In conclusion, this study shows that proximity fosters innovation through different mechanisms, with business models acting as selective transmission devices rather than universal mediators.

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BEYOND RESOURCES: UNIVERSITY INCUBATORS AND THE NEGLECTED DIMENSION OF ENTREPRENEURIAL TEAM MANAGEMENT IN EARLY-STAGE STARTUPS

Lingua, Francesco[1]; Demaria, Riccardo[1]

[1] Department of Management "Valter Cantino", University of Turin, Turin, Italy

Keywords: University incubators, Entrepreneurial teams, Team dynamics, Early-stage startups, Academic entrepreneurship, Team management, Qualitative research

Introduction

University incubators are central in academic entrepreneurial ecosystems, supporting early-stage startups through access to resources, mentoring, and networks. Prior research has focused on incubators' role in business model development and venture survival, often neglecting the internal functioning of entrepreneurial teams. Early-stage startups are characterised by fluid roles, emergent leadership, and high interpersonal interdependence. Evidence shows that team-related dysfunctions such as role ambiguity, leadership conflicts, and misaligned expectations are a primary cause of failure (Diakanastasi et al., 2018). Yet little is known about how university incubators engage with intra-team dynamics during the incubation process.

Purpose, Aim and Objectives

The study explores how university incubators support early-stage entrepreneurial teams beyond business and technical assistance. It aims to examine how incubators address team formation, leadership emergence, and internal coordination challenges. Objectives: (1) identifying forms of support provided for team management; (2) analysing main difficulties experienced by incubated teams; and (3) capturing teams' perceived needs regarding collaboration, leadership, and conflict resolution within academic incubation environments.

Literature Review and Theoretical Framework

Incubation literature predominantly adopts a resource-based view, emphasising access to financial capital, knowledge, and networks (Mian et al., 2016). This approach treats startups as

internally coherent units, overlooking team dynamics. Research on entrepreneurial teams highlights that early venture performance is shaped by role negotiation, shared leadership, and conflict management (Klotz et al., 2014). Team dynamics are particularly fragile in academic startups, where founders often lack managerial experience. This study integrates these perspectives, viewing university incubators as institutional contexts that may shape team norms and managerial practices.

Methodology and Methods

A qualitative interpretive approach is adopted. Data are collected via semi-structured interviews with early-stage startups operating within university-affiliated incubators in the Turin entrepreneurial ecosystem. Purposive sampling ensures variation in sector, team composition, and development stage. The sample is guided by theoretical saturation until no substantially new themes emerge. Interviews explore: (1) team origin and evolution; (2) perceived incubator support regarding team functioning; and (3) key interpersonal frictions and decision-making challenges. Interviews are transcribed and analysed using inductive thematic analysis, allowing recurring patterns and latent themes to emerge.

Expected Findings and Contribution

Findings are expected to show that incubators play a limited and informal role in addressing intra-team dynamics. While effective in business development support, interventions in team management are reactive and fragmented. Team-related issues are often addressed only when critical problems arise. Expected themes include leadership ambiguity, role misalignment, communication breakdowns, and informal conflict mediation. The study contributes empirically by documenting a structural blind spot in academic incubation practices and theoretically by integrating entrepreneurial team dynamics into the incubation literature.

Originality and Value

The study’s originality lies in shifting the focus from external resource provision to internal team processes within university incubators. By foregrounding team management as a neglected but critical dimension, it extends theories of academic entrepreneurship and incubation beyond the dominant resource-centric framing.

Research Limitations

The study is based on qualitative data from a limited number of incubators, which may constrain generalisability. Findings reflect team perceptions and are context-specific to academic incubation environments. The findings may also be relevant to similar university-based incubation contexts beyond Turin.

Theoretical and Practical Applications and Implications

Theoretically, the study suggests reconceptualising university incubators as organisational contexts shaping early team dynamics. Practically, it highlights the opportunity to integrate structured mechanisms such as role clarification, leadership coaching, conflict mediation into incubation programmes, enhancing startup resilience and long-term viability. Findings may lead incubation programmes toward more team-oriented support practices.

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FAN EXPERIENCES, SPORT TOURISM AND CONSUMER BEHAVIOUR AT THE AFRICAN CUP OF NATIONS

Nicoliello, Mario [1]

[1] Department of Economics and Management, University of Brescia, Italy

Keywords: Sport tourism; Consumer behaviour; Fan experience; Mega sport events; African Cup of Nations

Introduction

Mega sport events increasingly function as hybrid platforms where sport consumption, tourism experiences and consumer behaviour intersect. While events such as the FIFA World Cup and the Olympic Games have received extensive scholarly attention, continental tournaments – particularly those hosted in emerging tourism destinations – remain underexplored. The African Cup of Nations (AFCON) represents a significant case, both as the flagship football competition of the Confederation of African Football and as a catalyst for tourism development and destination branding. The 2025 AFCON hosted in Morocco offers a timely opportunity to explore how fans experience the event beyond the stadium, combining sport fandom with travel motivations, cultural encounters and consumption practices.

Purpose, Aim and Objectives

The research aims at investigating how football fans attending AFCON 2025 in Morocco experience the event as both a sport spectacle and a tourism experience. The study analyses fans' motivations, behaviours and perceptions in order to understand how sport events shape tourist consumption patterns and destination experiences. The objectives are threefold: (1) to explore fans' motivations for travelling to AFCON 2025; (2) to examine how fans consume sport, tourism and cultural products during the event; and (3) to analyse how these experiences influence perceptions of Morocco as a host destination. The research question is the following: How do sport fans attending AFCON 2025 construct and negotiate their roles as consumers of both sport and tourism experiences?

Literature Review and Theoretical Framework

The research draws on three main strands of literature: sport tourism, consumer behaviour in sport and event experience research. Sport tourism scholars highlight the dual identity of spectators as fans and tourists, emphasising the role of motivation, authenticity and place attachment (Gibson, 1998; Weed and Bull, 2009). Consumer behaviour research in sport has increasingly focused on experiential consumption, symbolic meanings and identity construction (Funk, 2017). Event experience frameworks further suggest that mega events generate value through emotional, social and cultural dimensions that extend beyond the core sport product (Getz, 2008). Despite this, limited research has examined African sport mega-events from the consumer perspective, representing a significant gap this study seeks to address.

Methodology

The research adopts a qualitative methodology based on semi-structured interviews conducted with football fans during AFCON 2025 in Morocco. Interviews were carried out in host cities before and after matches, targeting both domestic and international fans. This in-situ approach allows for the capture of lived experiences and immediate reflections on sport consumption, travel behaviour and destination interaction. Data were analysed using thematic analysis, enabling the identification of recurring patterns related to motivation, consumption practices and destination perceptions.

Main Findings and Contribution

Preliminary findings indicate that fans' motivations extend beyond football attendance to include cultural discovery, social interaction and destination exploration. AFCON 2025 is experienced as a multi-layered consumption experience in which matches act as anchors for broader tourism activities, including gastronomy, heritage tourism and informal social encounters. Fans perceive Morocco not only as a sport host but as an accessible and culturally rich destination, with positive implications for destination image formation. The findings contribute to a deeper understanding of sport events as experiential ecosystems rather than isolated spectacles.

Originality and Value

The originality of this study lies in its focus on AFCON as a sport tourism event and its consumer-centric perspective. Examining an African mega-event through fan interviews, the study challenges the dominance of Eurocentric and Global North contexts in sport tourism

research. It offers empirical insights into how continental tournaments can generate tourism value and shape consumer experiences in emerging destinations.

Research Limitations

The study is limited by its qualitative design and the contextual specificity of AFCON 2025, which may restrict generalisability. Language barriers and time constraints during the event may also influence data depth. Future research could adopt mixed-methods approaches or comparative designs across different editions of AFCON.

Theoretical and Practical Implications

Theoretically, the study contributes to sport tourism and consumer behaviour literature, reinforcing the concept of hybrid fan-tourist identities. Practically, the findings offer valuable insights for event organisers, destination managers and policymakers seeking to leverage mega sport events for sustainable tourism development. Understanding fan consumption patterns can inform integrated sport-tourism strategies and enhance the long-term legacy of continental sport events.

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FROM TRIP TO CONTINUUM: A SCOPING REVIEW OF AI-ENABLED IMMERSIVE TECHNOLOGIES IN DESTINATION EXPERIENCE DESIGN

Kouroupi, Nansy[1]

[1]Les Roches Global Hospitality Education, Crans-Montana, Switzerland

Keywords: immersive technologies; metaverse; extended reality; artificial intelligence; destination experience; temporal continuity; governance; scoping review.

Introduction

AI-enabled immersive technologies are being positioned as a bridge between physical travel and ongoing digital engagement, yet tourism research often describes these systems as stand-alone applications rather than as a temporal continuum. This matters because persistence changes what is measured (repeat engagement, memory effects, re-entry) and what must be governed (data, transparency, cultural integrity). This extended abstract reports early-stage outputs from an ongoing scoping review that maps how tourism and destination experience studies conceptualise and evaluate these converging realities (Dwivedi et al., 2022; Buhalis et al., 2024). Evidence on VR and presence suggests immersive media can shape attitudes and intentions, but effects depend on design, authenticity cues and context (Tussyadiah et al., 2018). Framed as a journey, AI-enabled touchpoints can extend value creation beyond the visit and into planning and remembering (Lemon and Verhoef, 2016).

Purpose, Aim and Objectives

The review maps how tourism and destination research frames and measures AI-enabled immersive experiences, with specific attention to (a) immersive modalities, (b) AI capabilities, (c) impact measures, and (d) whether "experience over time" is operationalised.

Literature Review and Theoretical Framework

Literature review and theoretical framework: Smart tourism scholarship frames destinations as data-rich ecosystems where value is co-created through technology-mediated interactions (Gretzel et al., 2015, Buhalis et al., 2024). Metaverse-focused tourism syntheses indicate rapid growth but fragmented constructs, with limited attention to longitudinal continuity and governance (Dwivedi et al., 2022). Within tourism, VR and AR reviews show growth yet limited theorisation of post-visit engagement and memory effects (Yung and Khoo-Lattimore,

2019). Technology studies stress socio-technical ecosystems and the rise of non-human service actors (Sigala, 2018). These strands motivate attention to how personalisation systems and agents reconfigure experience metrics across phases.

Methodology and Methods

A scoping review approach was selected to clarify conceptual boundaries and map evidence breadth (Arksey and O'Malley, 2005) and will be reported using PRISMA-ScR conventions (Tricco et al., 2018). Searches were executed in Scopus and Web of Science for January 2018-January 2026 (English; journal articles). Records were exported, merged and deduplicated; 72 duplicates and one retracted record were removed. The current dataset contains 139 unique records for title/abstract screening. Eligibility focuses on tourism and destination experience studies where an immersive modality (VR/AR/MR/XR/metaverse) is paired with an AI technique (e.g., chatbots, recommender systems) used for personalisation, guidance or interaction.

Main/Expected Findings and Contribution (Preliminary)

Preliminary text mining of titles and abstracts (n=139) suggests concentration on VR (70 records) and AR (45), with comparatively few explicit mentions of MR (4) and XR (3). AI is frequently signalled (110), most commonly via chatbots/conversational agents (21). By contrast, explicit mentions of recommender systems (7), generative AI (5) and large language models (3) remain limited. The most striking early signal is temporal silence: terms such as pre-trip, post-trip, "always on", "ongoing engagement" and "experience continuity" are absent from titles/abstracts. Only "journey" appears in two records and persistence terms in three, suggesting continuity is more often implied than explicitly measured. The planned synthesis will therefore prioritise how studies locate experiences in time and what they treat as evidence of continuity (e.g., repeat use, memory, loyalty, trust).

Originality and Value

The review foregrounds temporality and governance as first-order design and measurement questions, rather than treating them as secondary issues.

Research Limitations

Findings reported here are preliminary and derived from titles/abstracts and partial full-text retrieval. Full-text screening, data charting and synthesis are in progress and may refine interpretations.

Theoretical and Practical Applications/Implications

For destination organisations and technology partners, the emerging message is cautionary: persistence is frequently a design aspiration, but appears weakly specified in research language. Governance-by-design (data stewardship, transparency and cultural representation) may therefore need to be treated as an explicit variable to specify, measure and govern across phases, rather than assumed.

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RETHINKING THE LINK BETWEEN WORK-FAMILY CONFLICT AND TURNOVER INTENTIONS IN TOURISM AND HOSPITALITY

Papavasileiou Emmanouil, Kourgiantakis Markos and Rovithis Michael

Department of Business Administration and Tourism, Hellenic Mediterranean University, Heraklion, Greece

Keywords: work–family conflict; turnover intentions; systematic literature review; source attribution; PRISMA; tourism and hospitality

Abstract

Purpose: There is an ongoing scholarly debate regarding how the two dimensions of work–family conflict—family interference with work (FIW) and work interference with family (WIF)—affect key work-related outcomes such as turnover intentions. From a cross-domain perspective, FIW is expected to exert a stronger influence on turnover intentions, whereas the matching-domain perspective suggests that WIF should be more impactful. This study reviews the extent to which tourism and hospitality research engages with and contributes to this theoretical discussion.

Design/methodology/approach: A systematic literature review was undertaken using a multi-source search approach. This included peer-reviewed studies identified through previous reviews, Scopus, and Google Scholar. The review process adheres to the PRISMA 2020 guidelines.

Findings: This review offers a comprehensive and up-to-date synthesis of empirical research, incorporating a significant number of studies published since earlier reviews. The final sample consists of 30 peer-reviewed articles published between 2006 and 2025, contributed by 60 authors.

Originality/value: The review identifies four key directions for future research: (1) expanding the empirical scope beyond frontline employees and beyond predominantly Middle Eastern and Asian contexts (contextual); (2) embracing a bidirectional understanding of work–family conflict by jointly examining WIF and FIW (conceptual); (3) using source attribution theory to explain why WIF tends to predict turnover intentions more consistently than FIW (theoretical); and (4) exploring mechanisms that can buffer or reduce the negative impact of work–family conflict on turnover intentions (practical).

Introduction

Work–family conflict arises when the demands associated with work and family roles are incompatible (Greenhaus and Beutell, 1985). Drawing on role theory (Goode, 1960; Pleck, 1977) and further informed by conservation of resources theory (Hobfoll, 1989), prior research suggests that individuals possess limited time, energy, and cognitive resources to meet expectations across both domains. Consequently, competing demands often lead to conflict (Kappe et al., 2025; Wu and Perrigino, 2025). This conflict is typically conceptualised as bidirectional: work may interfere with family (WIF), and family may interfere with work (FIW). Although these two forms are related, they remain conceptually distinct (Kobayashi et al., 2025).

A key debate in the literature concerns how these two dimensions relate to outcomes. The cross-domain perspective posits that conflict originating in one domain has its strongest effects in the other domain; for instance, FIW may lead to higher turnover intentions (Shockley and Singla, 2011; Nohe et al., 2015; Zhao et al., 2019). In contrast, the matching-domain perspective suggests that the greatest effects occur within the same domain, implying that WIF is more likely to influence work-related outcomes, while FIW primarily affects family-related outcomes. Despite its importance, this theoretical distinction has received limited attention within tourism and hospitality research.

Turnover intentions remain a significant issue in the tourism and hospitality industry. Although the sector generates considerable employment, it is characterised by high levels of workforce instability. For example, in the United Kingdom, 41% of employees changed jobs between 2022 and 2023, while 12% exited the labour market entirely, resulting in a turnover rate of 53% (CIPD, 2024). High employee turnover imposes substantial organisational costs, including recruitment and training expenses, as well as diminished morale and service quality (De Vos et al., 2025). Even in cases where employees do not actually leave, the mere intention to do so can negatively affect organisational performance, as such employees are more likely to become disengaged or exhibit counterproductive behaviours (Ruiz-Palomino et al., 2021). Accordingly, identifying and understanding the drivers of turnover intentions—particularly the role of work–family conflict—is crucial for long-term organisational sustainability.

To address this gap, the present study provides an updated systematic review with two main objectives: (1) to synthesise the most recent empirical findings, and (2) to identify contextual, conceptual, theoretical, and practical limitations that should guide future research and practice.

To achieve these objectives, the review is guided by the following research questions:

RQ1 (Contextual): In which organisational and cultural settings has the relationship between work–family conflict and turnover intentions been examined, and how do these contexts shape the relationship?

RQ2 (Conceptual): How has work–family conflict been conceptualised—particularly with respect to its bidirectional nature—and what are the implications for understanding its link to turnover intentions?

RQ3 (Theoretical): What theoretical frameworks have been used to explain this relationship, and how do they enhance or limit current understanding?

RQ4 (Practical): What mechanisms have been identified as effective in mitigating the impact of work–family conflict on turnover intentions?

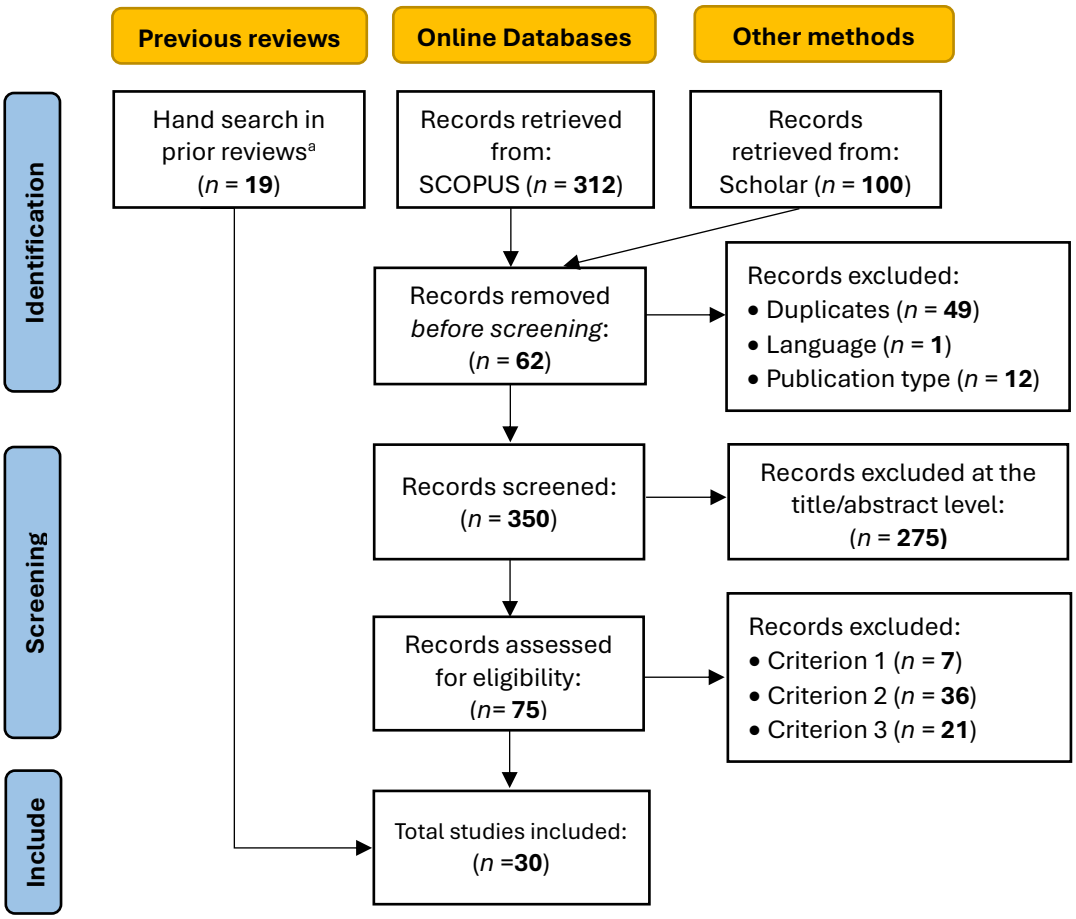
By addressing these questions, this review not only updates the existing body of knowledge but also evaluates whether the observed dominance of WIF over FIW reflects a genuine theoretical pattern or is instead shaped by how work–family conflict has been operationalised in prior research.

Methodology

This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework (Page et al., 2021), which comprises a 27-item checklist (Appendix A) and a flow diagram illustrating the stages of identification, screening, and inclusion (Figure 1). Adopting PRISMA 2020 improves methodological transparency, enhances replicability, and ensures a systematic and consistent review process (e.g., Papavasileiou et al., 2025b; Sahoo and Sethi, 2025).

Search strategy

The review included only English-language studies published in peer-reviewed journals. Eligible studies were required to employ quantitative methods to examine the relationship between work–family conflict (WIF and/or FIW) and turnover-related outcomes, including intention to stay and withdrawal behaviours, within the tourism workforce. Based on these criteria, a three-stage search strategy was implemented (Papavasileiou and Stergiou, 2025).



Inclusion/exclusion criteria: A quantitative study focusing on the relationship between work-family conflict (*Criterion 1)* and turnover intention (including intention to stay and withdrawal behaviours) (*Criterion 2)* within the tourism and hospitality workplace (*Criterion 3)*.

Database	**Search string**	**Limits**	
Scopus	(TITLE-ABS-KEY ("work- family conflict" OR "family-work conflict") AND ALL ("hospitality" OR "tourism")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (EXACTKEYWORD , "Work-family Conflict") OR LIMIT-TO (EXACTKEYWORD , "Work–family Conflict"))	Source	Peer-reviewed articles (excl. reviews, chapters & conferences)
		Language	English
		Period	No limit
Google Scholar	{"Work-family conflict" OR "Family-work conflict" AND "turnover" AND "tourism" OR "hospitality"}	As above	

Source: *based on Page et al (2021)*
Note: Last search 22 August 2025; [a] Work-family conflict (Liu et al, 2022; O'Neill and Follmer, 2020; Wang et al, 2024; Xu and Cao, 2019; Zhao et al, 2020a; Zhao et al, 2020b) and turnover intentions (Krishnan and Rathakrishnan, 2025; Nguyen et al, 2023; Park and Min, 2020)

Figure 1 – PRISMA 2020 flow diagram and search strategy for capturing studies about the relationship between work-family conflict and turnover intentions in tourism workforce.

First, as outlined in the introduction, the reference lists of prior review articles were manually examined, resulting in the identification of 19 relevant studies. Second, the Scopus database was searched, following the approach of Pakhalov et al. (2025), who highlight that Scopus-based searches help capture studies beyond tourism-specific journals, including those in management, business ethics, and marketing. Keyword combinations applied to the "title, abstract, and keywords" fields yielded 310 records (Figure 1). Third, an additional search using Google Scholar was conducted with the same search string, in line with Sposato et al. (2025), and the first 100 results were screened (Papavasileiou et al., 2025a).

Screening

A total of 412 records were initially retrieved. These were first screened to remove duplicates and to ensure compliance with language and publication type criteria (i.e., English-language, peer-reviewed journal articles), resulting in the exclusion of 62 records. Subsequently, the first and second authors independently reviewed the titles and abstracts of the remaining 350 studies, with any discrepancies resolved through consultation with the third author.

This stage resulted in the exclusion of 275 studies, with minimal potential for bias. The remaining 75 articles were then subjected to full-text review using the eligibility criteria specified in Appendix B. At this point, a further 64 studies were excluded following detailed assessment. For example, Rasheed et al. (2018) focused on female employees in the banking sector rather than tourism. Likewise, Mensah et al. (2023) investigated work–leisure conflict instead of work–family conflict among hotel employees. In addition, although Zhao et al. (2024) examined customer misbehaviour, work–family conflict, and withdrawal behaviours, they did not directly assess the relationship between work–family conflict and turnover intentions.

Data extraction

The final sample of 30 eligible studies was compiled into a Microsoft Excel file. Following Papavasileiou et al. (2025c), a standardised data extraction framework was applied, consisting of four separate spreadsheets aligned with the study's four research questions (Table 1). This approach facilitated a structured and consistent analysis of contextual, conceptual, theoretical, and practical insights across the included studies.

	RQ1		RQ2	RQ3	RQ4	
Study	**Country**	**Sector**	**WFC**	**Theory**	**WIF→TI**	**FIW→TI**
Karatepe and Baddar (2006)	Jordan	Hotels	WIF and FIW	Empirical	+	+
Karatepe and Sokmen (2006)	Turkey	Hotels	WIF and FIW	Empirical	+	+
Karatepe and Kilic (2007)	N. Cyprus	Hotels	WIF & FIW	COR	+	**NS**
Karatepe and Uludag (2007)	N. Cyprus	Hotels	Only WIF	Empirical	**NS**	N/A
Karatepe et al (2008)	N. Cyprus	Hotels	WIF & FIW	COR	+	**NS**
Karatepe and Magaji (2008)	Nigeria	Hotels	WIF & FIW	Empirical	+	**NS**
Karatepe and Uludag (2008)	Turkey	Hotels	WIF & FIW	Empirical	+	+
Yavas et al (2008)	Turkey	Hotels	WIF & FIW	Empirical	+	+
Blomme et al (2010)	Worldwide	Hotels	Only WIF	Empirical	+	N/A
Karatepe and Azar (2013)	Iran	Hotels	WIF & FIW	Scarcity theory	+	+
Yunita and Kismono (2014)	Indonesia	Hotels	WIF & FIW	Empirical	+	**NS**
Karatepe and Karadas (2014)	Romania	Hotels	WIF & FIW	COR	**NS**	+
Karatepe and Kilic (2015)	N. Cyprus	Travel agencies	Only WIF	Empirical	+	N/A
Zhou and Wen (2016)	China	Hotels	Only WIF	Empirical	+	N/A
Vong and Tang (2017)	Macau	Mixed[1]	Only WIF	Empirical	+	N/A
Wang et al (2017)	Taiwan	Hotels	WIF & FIW	COR	+	**NS**
Yang and Peng (2018)	China	Hotels	WIF & FIW	COR & RDT	+(JS)	**NS**
Pan and Yeh (2019)	China	Hotels	Only WIF	Empirical	+	N/A
Chan and Ao (2019)	Macau	Casinos	Only WIF	Role theory	+ (OC)	N/A
Arefin et al (2020)	Bangladesh	Hotels	Only WIF	COR	+	N/A
Putra and Suwandana (2020)	Indonesia	Hotels	Only WIF	Empirical	+	N/A
Yorulmaz and Sevinc (2021)	Turkey	Yacht captains	Only WIF	Empirical	+	N/A
Abdou et al (2022)	Egypt	Hotels	Only WIF	Empirical	+	N/A
Abdelaal and Abbas (2022)	Saudi Arabia	Hotels	Only WIF	Empirical	+	N/A
Uludag et al (2023)	Nigeria	Travel agencies	Only WIF	Spillover theory	+	N/A
Atmajaya et al (2024)	Indonesia	Restaurants	Only WIF	Empirical	+	N/A
Mistry et al (2024)	USA	Events	Only WIF	Empirical	+	N/A
Bai et al (2025)	Macau	Casinos	Only WIF	Empirical	**NS**	**NS**
Bai and Zhou (2025)	Macau	Casinos	WIF & FIW	Empirical	+	N/A
Mistry et al (2025)	USA	Events	Only WIF	Empirical	**NS**	N/A

Note: Within parenthesis denotes mediator; [1] Casinos, hotels, travel agencies, retail, F&B; COR=Conservation of resources; RDT=Resource depletion theory; N/A=Not Applicable; NS=Not supported; (+)=positive; WIF=Work-Family Interference; FIW=Family-Work Interference; JS=Job satisfaction; OC=Organizational Commitment

Table 1: Characteristics of the literature based on the review questions

Results – Two Decades of Tourism and Hospitality Literature (2006–2025)

Table 1 illustrates the evolution of research on work–family conflict and turnover intentions over the past two decades, organised around the four review questions. In the first period (2006–2015), a total of 13 studies were identified. With the exception of Blomme et al. (2010) and Yunita and Kismono (2014), the majority were authored by Osman Karatepe and his collaborators (n = 11). From a contextual perspective (RQ1), most studies focused on frontline hotel employees (93%), with only one examining travel agency workers (Karatepe and Kilic, 2015). Geographically, approximately 70% of the research was conducted in the Middle East, with a limited number of studies undertaken in Romania (Karatepe and Karadas, 2014), Indonesia (Yunita and Kismono, 2014), and Nigeria (Karatepe and Magaji, 2008).

From a conceptual and theoretical standpoint (RQ2 and RQ3), ten studies adopted a bidirectional view of work–family conflict, proposing that both WIF and FIW would positively influence turnover intentions, largely drawing on prior empirical evidence. However, only about half of these hypotheses were empirically supported (e.g., Yavas et al., 2008). Three additional studies focused exclusively on WIF, two of which found significant positive relationships with turnover intentions (e.g., Blomme et al., 2010). Notably, research during this period did not examine any mediating mechanisms (RQ4).

In the subsequent period (2016–2025), the volume of research increased substantially to 30 studies, involving a more diverse group of scholars (n = 50), with at least one publication appearing each year. Contextually (RQ1), the scope expanded beyond hotels to include other settings such as casinos (e.g., Vong and Tang, 2017), restaurants (e.g., Atmajaya et al., 2024), events (e.g., Mistry et al., 2024), and yachting (e.g., Yorulmaz and Sevinc, 2021). Geographically, there was a noticeable shift towards Asian contexts (59%), including Taiwan (Wang et al., 2017), Macau (Chan and Ao, 2019), Bangladesh (Arefin et al., 2020), China (Pan and Yeh, 2019), and Indonesia (Putra and Suwandana, 2020).

Conceptually (RQ2), most studies in this later period focused on a unidirectional approach, primarily examining WIF. Fourteen studies operationalised work–family conflict solely in this way and, from a theoretical perspective (RQ3), generally hypothesised a positive relationship with turnover intentions, with most findings supporting this expectation (e.g., Abdou et al., 2022). Only three studies examined both WIF and FIW, drawing on conservation of resources theory, although two reported non-significant effects (e.g., Bai et al., 2025; Yang and Peng,

2018). Research into mediating mechanisms (RQ4) also began to develop during this period, with a small number of studies identifying job satisfaction and organisational commitment as key mediators (e.g., Yang and Peng, 2018; Chan and Ao, 2019).

Discussion and Future Research Directions

The review indicates that research on work–family conflict and turnover intentions is heavily concentrated in specific geographical regions—primarily the Middle East and Asia—and tends to focus on similar organisational contexts, particularly hotel settings. This narrow concentration restricts the generalisability of existing findings. The analysis further reveals that much of the literature does not explicitly engage with the distinction between cross-domain and matching-domain perspectives. This oversight appears to stem from both conceptual limitations—especially the frequent reliance on unidirectional measures of conflict—and unresolved theoretical inconsistencies. Consequently, the observed patterns in the literature seem to be influenced more by how constructs are measured than by robust theoretical explanations.

Moreover, although there is widespread agreement that work–family conflict is a significant predictor of turnover intentions, relatively limited attention has been given to identifying mechanisms that might buffer or mitigate this relationship. In response, the following section outlines key directions for future research, drawing on relevant theoretical frameworks and recent calls for stronger theoretical development in the field.

Contextual directions – Broadening the empirical scope

The findings highlight a strong geographical concentration of studies, largely confined to the Middle East and Asia, which limits the wider applicability of results. Future research should therefore expand into more diverse cultural and occupational contexts to enhance generalisability. For instance, Mistry et al. (2024) provide valuable insights through their study of an international event association in the United States. Additionally, the review confirms that most studies focus on frontline roles, a trend also identified by Magrizos et al. (2023), who note that hospitality research often prioritises customer-facing employees while neglecting back-of-house roles, such as kitchen staff. Extending research to underexplored groups—such as chefs—would help address this gap and respond to recent calls (e.g., Giousmpasoglou et al., 2025) to examine employee experiences in less visible workplace settings.

Conceptual directions – Emphasising bidirectionality

The conceptual review suggests that recent studies often fail to clearly distinguish between cross-domain and matching-domain perspectives, largely because work–family conflict is frequently operationalised as a unidirectional construct, typically focusing only on WIF. This limitation has been highlighted by Nohe and Sonntag (2014), who argue that examining only one dimension overlooks the value of assessing both WIF and FIW simultaneously. Although earlier work, particularly by Karatepe and colleagues, considered both directions, these studies generally assumed uniform positive effects, making it difficult to disentangle their distinct contributions. Future research should therefore treat work–family conflict as a genuinely bidirectional construct and test both dimensions concurrently (see Kappe et al., 2025). This approach aligns with recent developments in social science and health research, which emphasise the importance of separately examining both directions due to their distinct effects (Kobayashi et al., 2025).

Theoretical directions – Reconciling competing perspectives

The review also demonstrates that many existing hypotheses are grounded more in prior empirical findings than in well-developed theoretical reasoning. Among studies that do adopt a theoretical lens, conservation of resources (COR) theory is most commonly used and aligns with the cross-domain perspective. According to this view, resource loss in one domain should primarily affect outcomes in the other, suggesting that FIW should be the stronger predictor of work-related outcomes such as turnover intentions. However, empirical evidence consistently shows that WIF has a greater impact, revealing a clear theoretical inconsistency.

To address this gap, future research should consider alternative frameworks, such as the source attribution perspective (Zhang et al., 2019). For example, Yang and Peng (2018) demonstrate that attribution-based explanations may better account for the relationship between work–family conflict and job outcomes than traditional resource-based models. Adopting such perspectives may provide a more coherent explanation of observed patterns and supports calls by Ladkin et al. (2023) to use tourism contexts as platforms for advancing new theoretical insights.

Practical directions – Identifying mitigating mechanisms

Despite strong evidence linking work–family conflict to turnover intentions, the literature has paid limited attention to identifying factors that could mitigate this relationship. Shifting the focus toward such mechanisms would enable researchers to move beyond documenting negative outcomes and toward identifying actionable solutions. Only two studies in the current review—Yang and Peng (2018) and Chan and Ao (2019)—identify mediators, suggesting that job satisfaction and organisational commitment can reduce the negative effects of WIF.

Future research should extend this line of inquiry by examining additional mediating variables, including constructs from positive psychology such as work engagement and perceived organisational support. This direction aligns with Liu et al. (2025), who advocate for more comprehensive models that capture the psychological processes underlying work–family dynamics.

Emerging evidence also points to the potential of intervention-based approaches. For instance, Amiri et al. (2026) found that an eight-session resilience training programme significantly reduced work–family conflict among nurses and their partners, with consistent effects across genders. Similarly, Tirrel et al. (2026) show that flexible working arrangements are associated with lower turnover intentions. Future research should explore whether similar interventions can be effectively applied within tourism and hospitality contexts to reduce both work–family conflict and employee turnover.

Conclusion

The aim of this study was to position business research within the wider debate on work–family conflict by exploring its patterns and implications in organisational contexts. To do so, a systematic literature review was conducted examining the relationship between work–family conflict and turnover intentions in the tourism and hospitality sector. The review offers a comprehensive and up-to-date synthesis of empirical evidence, incorporating a substantial number of studies published since previous reviews. In total, 30 peer-reviewed articles published between 2006 and 2025, contributed by 60 scholars, were analysed.

By integrating existing findings and highlighting key contextual, conceptual, theoretical, and practical limitations, this review provides a solid foundation for advancing research on work–

family conflict and employee retention in the sector. The proposed future research directions outline a clear and actionable agenda to address current gaps, responding to calls for more rigorous, diverse, and context-sensitive scholarship.

However, the study is subject to certain limitations. Most notably, the review includes only peer-reviewed articles published in English, which may have contributed to the underrepresentation of research from regions such as South America and France, where scholars often publish in Spanish, Portuguese, or French rather than English (Boncourt et al., 2022; Takahashi et al., 2025). Future reviews would benefit from adopting multilingual search strategies to achieve broader and more inclusive coverage. Encouragingly, a growing body of tourism research is beginning to incorporate non-English scholarship—for example, studies published in Spanish, Portuguese, and French (e.g., Romera et al., 2024)—thereby helping to bring previously overlooked knowledge "into the light" (Papavasileiou and Stergiou, 2025).

Despite these limitations, this review encourages scholars to build on the identified literature—particularly studies that acknowledge the bidirectional nature of work–family conflict—and to conduct meta-analytic comparisons across sectors, such as nursing or education. Such efforts would enhance understanding of work–family conflict across different occupational contexts and support the development of more effective workforce strategies in service-intensive industries.

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SAFEGUARDING XENIA: BUILDING RISK-RESILIENT HOSPITALITY IN AN AGE OF UNCERTAINTY

Paraschi, Elen Paraskevi[1]; Lampropoulos, Ioannis[2]; Georgopoulos, Antonios[2]; Georgopoulos, Nikolaos[2]; Anastasopoulou, Aikaterini[1]; Chatzopoulou Evi[1]

[1]Department of Tourism Management, University of Patras, Patras, Greece.

[2]Department of Business Administration, University of Patras, Patras, Greece.

Keywords: Risk assessment, Risk management, Hotels, Resilience, Tourism, Greece, Xenia, Uncertainty

Introduction

Risk assessment and management are essential in the hotel sector due to its exposure to an expanding range of risks (Brown et al., 2017). While existing studies examine specific risk categories, research remains fragmented and weakly connected to organizational resilience. This study addresses this gap by offering an integrated, manager-informed assessment of natural, safety, and security risks, framed through the culturally grounded concept of *xenia* (ξενία) - the sacred duty of hospitality that demanded protection and care for guests.

Purpose, Aim and Objectives

This study identifies key risks, explores managers' perceptions of their likelihood and severity, and evaluates the effectiveness of current risk management practices, highlighting ways to uphold the spirit of *xenia* while strengthening resilience and sustainability.

Literature Review and Theoretical Framework

Risk assessment in hotels is multi-dimensional, encompassing natural, health and safety, and security hazards (Vivel-Búa et al., 2018). Natural hazards include earthquakes, floods, typhoons, wildfires, and landslides, depending on location. Health

and safety hazards involve risks such as injuries, burns, electric shocks, chemical and biological exposure, and ergonomic issues. Security hazards include crime, terrorism, political violence, and cybersecurity threats.

Risk assessment raises awareness of hazards, evaluates their likelihood and severity, and supports risk prioritization (van Duijne et al., 2008). Subsequently, risk management includes strategies to control, reduce, transfer, or accept risks (Cummins, 2017).

Methodology and Methods

Grounded in the literature (Paraschi, 2025), this study adopts a four-step approach: risk identification and classification; risk analysis; risk evaluation through a risk matrix; and risk management.

Data were collected from 41 hotels across Greece between January and March 2024, using random sampling. Greece was selected as a case study due to its mature tourism sector and recent exposure to multiple risks, including financial crises, pandemics, earthquakes, floods, and wildfires. Using a five-point Likert scale, respondents assessed the likelihood and impact of natural, safety, and security risks, as well as the adequacy of existing risk management measures. Descriptive and inferential statistics were used for data analysis.

Findings and Contribution

The findings show that safety hazards, particularly psychological risks such as mobbing, are perceived as both more likely and more severe. Natural and security hazards are rated at moderate levels, with cybersecurity threats (especially phishing and cyberattacks), along with fires and earthquakes, emerging as key concerns.

In terms of risk management, hotels report stronger preparedness for natural hazards, moderate protection against safety risks, and weaker readiness for cybersecurity threats. Fire safety measures are the most commonly implemented, while greater attention is needed for cyberattack response planning and workplace ergonomics.

Originality and Value

This study draws on insights from experienced hotel managers who have faced multiple risks. The findings offer practical value for researchers, practitioners, and policymakers aiming to strengthen organizational resilience in an increasingly VUCA environment.

Research Limitations

Among the study's limitations are the relatively small sample size, the geographically limited study area, and the exclusive use of a qualitative risk assessment method, which entails a risk of subjectivity.

Theoretical and Practical Applications and Implications

This study contributes to risk management literature through a framework inspired by *xenia* - the ancient Greek sacred duty to protect guests. By identifying, assessing, and prioritizing risks while highlighting mitigation measures, this research enables hotels to fulfil their modern duty of care. This builds trust, enhances satisfaction and brand equity (Du, Sun & Wang, 2025), strengthens competitive advantage (Cummins, 2017), and ensures compliance (van Duijne et al., 2008). In honoring *xenia* through risk management, hotels transform from service providers to guardians of safety - reviving an ancient covenant between host and guest.

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CULTURAL BRANDING FOR UNDERRATED DESTINATIONS: QUALITATIVE FRAMEWORK FOR ENHANCING GLOBAL VISIBILITY

Razi Parjikolaei, Heidar[1]; Sanchez Bengoa, Dolores[2]

[1]Business Management Department, Hochschule der Wirtschaft für Management (HdWM), Mannheim, Germany

[2] Business Management Department, Hochschule der Wirtschaft für Management (HdWM), Mannheim, Germany

Abstract

This study explores how cultural branding enhances the visibility of underrated destinations in Iran. It integrates Cultural, Emotional, Viral, and Mind-Share Branding into a conceptual framework. A qualitative design used semi-structured interviews with ten stakeholders in Iran. Data was analysed using thematic and framework-based coding in MAXQDA. Findings show cultural meaning-making is central to branding heritage-rich but underrated destinations. Emotional branding strengthens visitor attachment, viral mechanisms increase digital visibility, and mind-share strategies support message consistency. Rituals and cultural narratives emerged as key assets.

Originality / Value:

This study proposes an integrative cultural-branding framework for underrated destinations, combining stakeholder insights with branding models.

Keywords

Cultural branding; destination branding; qualitative research; underrated destinations; Iran; emotional branding; viral branding; mind-share branding

Introduction

This gap reflects fragmented branding, inconsistent storytelling and limited digital engagement (Kavaratzis, 2005; Karoubi et al., 2022; Tran & Rudolf, 2022).

Research Gap

Existing destination branding frameworks remain fragmented (Holt, 2004; Aaker, 1996; Godin, 2000), limiting the global visibility of underrated destinations (Tran & Rudolf, 2022; Pradnyandari et al., 2025). This study proposes an integrated cultural branding framework.

Research Objectives

This study examines how cultural branding enhances the visibility of underrated destinations in Iran through an integrated branding framework.

Literature Background

Destination branding creates identity through differentiation, emotional engagement, and consistent communication (Aaker, 1996; Kavaratzis, 2005; Prayag et al., 2017). For underrated destinations, branding communicates cultural narratives globally (Holt, 2004; Roh et al., 2025). Recent research shows destination brand awareness, association and image strengthen brand equity and loyalty (Pradnyandari et al., 2025). Cultural branding (Holt, 2004) views brands as cultural artifacts shaped by myths, symbols, and rituals. Complementary perspectives include Emotional, Viral (Godin, 2000), and Mind-Share Branding (Aaker, 1996), integrated into a framework for underrated destinations (Figure 1).

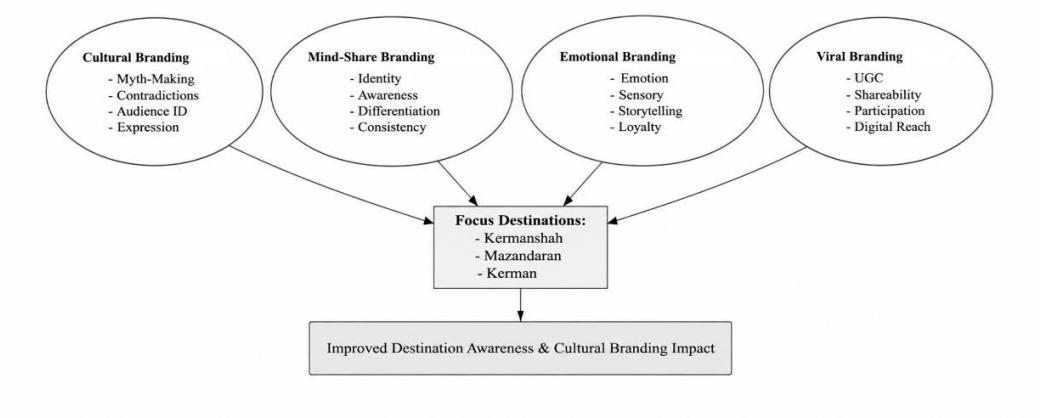


Figure 1. Conceptual framework for underrated destinations.

Source: Author's synthesis from Holt (2004), Aaker (1996), and Godin (2000).

Methodology

This study adopts a qualitative design to explore destination branding. Data were collected through semi-structured interviews with ten tourism and hospitality stakeholders in Iran. Interviews were conducted in Persian or English. Data were analysed through thematic and framework coding in MAXQDA. Participant data were anonymized.

Results and Discussion

Findings show that cultural meaning-making is central to branding heritage-rich but underrated destinations. Cultural elements create stronger emotional connections than monument-based tourism. Symbols and narratives function as identity anchors. Cultural branding emerged as the authentic approach, while emotional branding strengthened visitor attachment, viral branding increased digital visibility, and mind-share branding remained weakest due to fragmented national messaging. These findings highlight rituals and narrative continuity as branding mechanisms.

Conclusion

The proposed framework explains how underrated destinations strengthen identity and visibility. Cultural meaning-making forms the core of destination identity, emotional engagement strengthens visitor attachment, viral mechanisms expand digital visibility, and mind-share branding ensures message consistency. Rituals, symbols and cultural narratives are key branding assets.

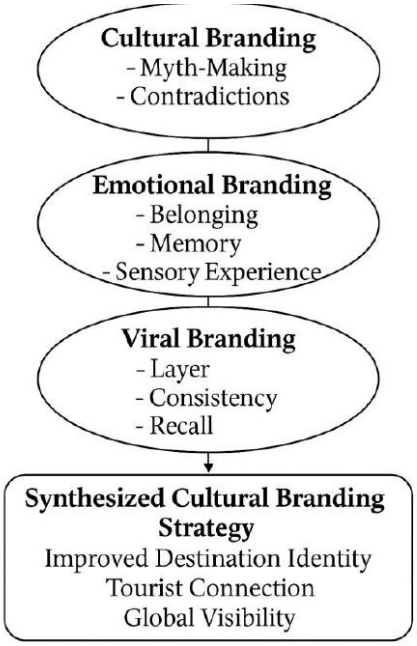


Figure 2. Final branding framework for underrated Iranian destinations.

Source: Author's synthesis based on Holt (2004); Godin (2000); Aaker (1996).

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ESG STRATEGY FOR ACHIEVING LONG-TERM SUSTAINABILITY

Paužuolienė, Jurgita; Šimanskienė, Ligita

Management and Economics Department, Klaipeda university, Klaipeda, Lithuania

Keywords: Sustainability, ESG strategy, stakeholders.

Introduction

Companies are increasingly embedding Environmental, Social, and Governance (ESG) principles into their long-term sustainability frameworks to address regulatory, investor, and societal demands for responsible and sustainable business practices.

In recent years, due to stricter environmental regulations and growing consumer and investor expectations regarding sustainability, companies have increasingly faced the need not only to declare their commitment to sustainability but also to effectively implement ESG principles in their day-to-day operations. ESG has become an integral part of many companies' strategic agendas, particularly following the introduction of mandatory sustainability reporting requirements, such as the European Union's Corporate Sustainability Reporting Directive (CSRD).

Purpose, Aim and Objectives

The purpose of this article is to analyze the impact of integrating ESG strategies into organizational operations on long-term sustainability. The study aims to examine how ESG strategies are integrated into organizational operations and how this integration contributes to long-term value creation, as well as to identify stakeholder expectations and the key challenges associated with ESG implementation. The objectives of the study are: to analyze the challenges and benefits of integrating ESG strategies into organizational operations; to explain how ESG contributes to long-term value creation and sustainability; to assess stakeholder expectations regarding ESG practices and performance.

Literature Review and Theoretical Framework

An ESG strategy is a framework that integrates sustainability considerations into an organization's decision-making, creating long-term value for stakeholders while ensuring environmental stewardship, social responsibility and ethical management. ESG principles are associated with

greater stakeholder trust, reputation, financial performance, and long-term organizational resilience (Kulova and Alexieva, 2023; Laokulrach, 2025).

A review of the literature highlights the key elements of ESG strategies: Governance Structures (Kulova and Alexieva, 2023; Ed-Dafali et al., 2025; Sinha, 2026; Alhamami, 2025); Stakeholder Engagement (Kulova and Alexieva, 2023; Ed-Dafali et al., 2025; Biswas and Dygas, 2025); Transparency & Standardized Disclosures (Kulova and Alexieva, 2023; Ed-Dafali et al., 2025; Biswas and Dygas, 2025) Knowledge Management (Alhamami, 2025; George et al., 2025); Alignment with Global Frameworks (Skvarciany and Jureviciene, 2024).

At the same time, several fundamental challenges are highlighted, including inconsistency in ESG ratings, lack of transparency, differing reporting standards, limited infrastructure, and resistance to integration within organizational culture. These factors make it difficult to accurately assess the real impact of ESG practices and to support effective decision-making. The conceptual ESG strategy framework is provided in the Figure 1.

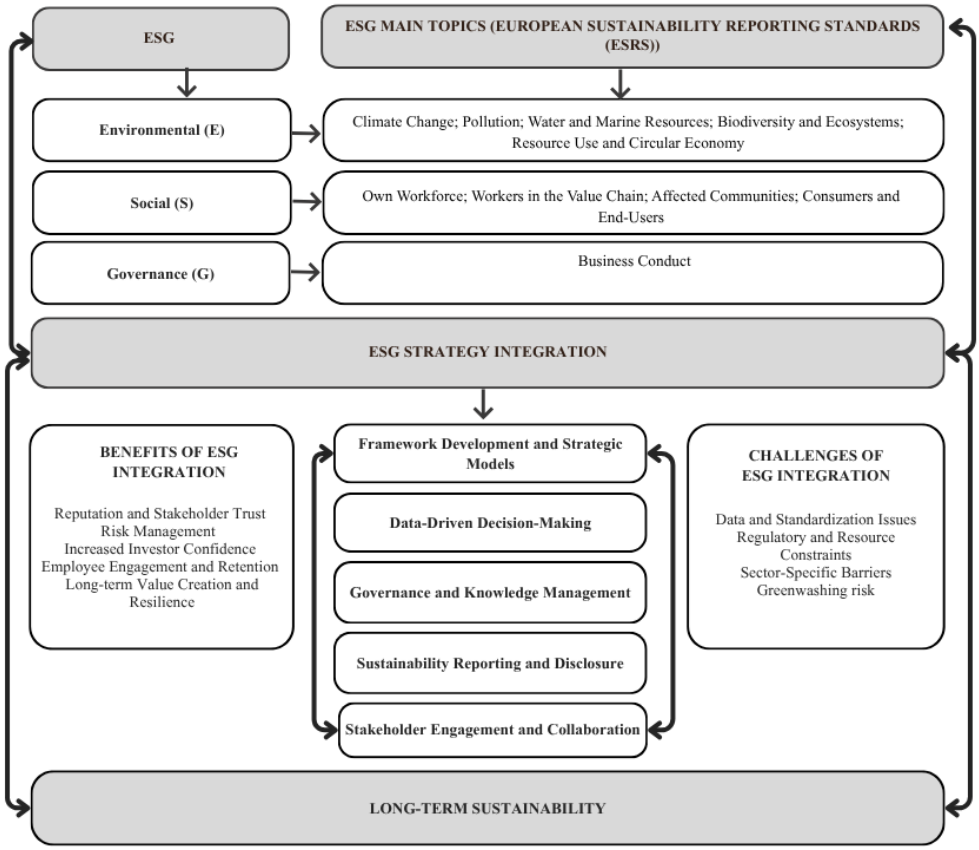


Figure 1: *ESG strategy conceptual framework.*

Methodology and Methods

The study applies a systematic analysis of 80 peer-reviewed scientific articles published between 2016 and 2026, conducted in accordance with PRISMA guidelines. The theoretical foundations, application contexts, and methodological approaches are analyzed to identify ESG strategy implementation practices, key challenges, and aspects related to long-term sustainability impacts.

To initiate the systematic review, a literature search was first conducted using the Scopus database. A carefully designed search string was employed to identify articles addressing ESG or sustainability strategies. The screening data process is presented in the PRISMA flow diagram shown in Figure 2.

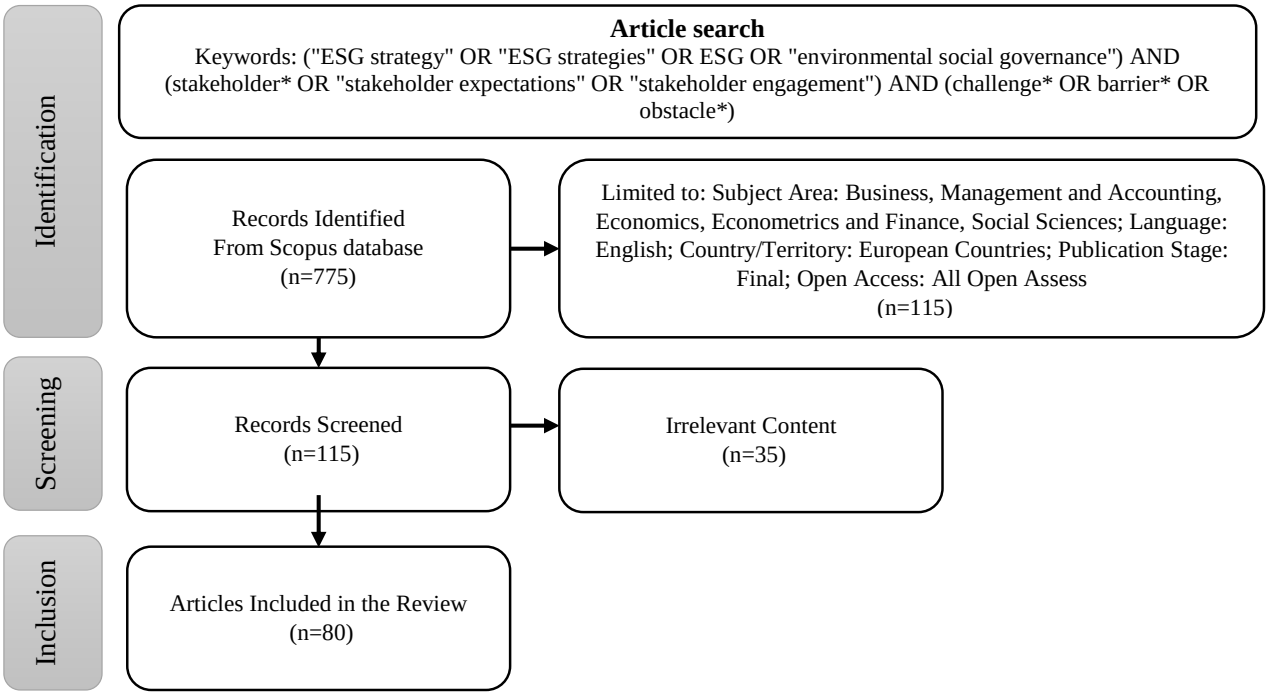


Figure 2: *Screening data process.*

Main Findings

To achieve long-term sustainability through an effective ESG strategy, organizations must integrate ESG principles into their core governance and decision-making processes, tailor their approaches to sector-specific challenges, and enhance transparency and credibility through standardized disclosures.

An effective ESG strategy for long-term sustainability requires a multi-faceted approach that incorporates strong governance, transparent reporting practices, and adaptation to sector-specific

needs. By addressing challenges such as standardization and the balance between financial performance and sustainability objectives, organizations can create value for stakeholders while contributing to a more sustainable future.

Originality and Value

This article contributes to the sustainability and strategic management literature by systematically analyzing ESG integration within organizations and developing a conceptual framework that explains how ESG strategies are embedded in organizational processes. The study identifies the key challenges and benefits associated with ESG integration with an emphasis on long-term sustainability.

Research Limitations

This study relies on secondary data, limiting direct assessment of causal links between ESG integration and organizational performance. It also does not account for sectoral or regional differences. Future research should incorporate quantitative and qualitative empirical studies to address these gaps.

Theoretical and Practical Applications and Implications

Theoretically, this study extends sustainability, stakeholder, and resource-based theories. Practically, it provides managers and policymakers with guidelines on how to integrate ESG into organizational strategy, avoiding challenges and addressing stakeholder needs.

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ESG KPIS AND KRIS FOR WATER AND WASTEWATER UTILITIES: A SYSTEMATIC REVIEW AND TAXONOMY FOR RISK-ORIENTED INDICATOR DESIGN

Kostaki, Aggeliki[1]; Goneswaran, Shopithan[2]; Spanaki, Konstantina[3]; Voyiatzis, Ioannis[4]

[1] University of West Attica, Athens, Greece

[2] Heilbronn University, Heilbronn, Germany

[3] Audencia Business School, Nantes, France

[4] University of West Attica, Athens, Greece

Keywords: ESG indicators, KPIs, KRIs, water utilities, wastewater utilities, operational risk, resilience, strategic governance.

Water and wastewater utilities are increasingly exposed to ESG-related disruptions driven by climate volatility, regulatory transition and infrastructure ageing. However, the indicator systems currently used across the sector remain largely designed for disclosure and compliance, rather than for strategic risk governance, early warning and resilience-building. This misalignment creates a managerial and strategic gap for utilities operating under uncertainty.

This paper addresses that gap by proposing a sector-specific taxonomy of ESG Key Performance Indicators (KPIs) and Key Risk Indicators (KRIs) for water and wastewater utilities, shifting the focus from reporting-oriented measurement to risk-oriented indicator design. The study is guided by three questions: which ESG-related indicators are currently used in the sector; how these indicators are structured across ESG dimensions and risk categories; and where current indicator systems reveal blind spots that limit early warning, adaptive capacity and strategic prioritisation. In this context, the paper conceptualises ESG risk as a dimension of operational risk in critical infrastructure and distinguishes between lagging KPIs, leading KRIs and dual-role indicators that can support both performance management and risk escalation.

Methodologically, the study adopts a systematic literature review and design-oriented approach, drawing on Webster and Watson's (2002) guidance for backward and forward searching and concept matrix synthesis, and on Fettke's (2006) framework for structured classification and taxonomy development to systematically and transparently identify research published between 2020 and 2025 on ESG, sustainability and risk-relevant indicators

in water and wastewater utilities. The identified indicators are coded by ESG pillar, indicator role, risk category, strategic objective and early-warning relevance, enabling a structured KPI–KRI taxonomy and matrix tailored to sector-specific operational realities.

The findings show a dominance of environmental and performance-oriented KPIs, especially in relation to water quality compliance, leakage, non-revenue water, energy use and emissions, while explicit KRIs remain underdeveloped. Social and governance indicators are narrower in scope and used mainly for compliance, reliability or incident reporting. At the same time, several existing indicators appear to hold latent early-warning potential and could be redesigned as dual-role indicators through threshold-based monitoring and escalation logic. The analysis also reveals important blind spots, including limited attention to infrastructure vulnerability, transition-related stressors, service continuity exposure and governance mechanisms that could support earlier and more proactive intervention.

The paper contributes to theory by reframing ESG indicators as dynamic components of strategic risk governance rather than as static disclosure tools, and by showing how indicator architectures make ESG-related risk interdependencies visible and governable operationally. It contributes to practice by offering a structured basis for utilities, regulators and benchmarking organisations to redesign ESG indicator portfolios in ways that strengthen resilience, improve investment prioritisation and support long-term value creation. Overall, the paper adds originality by articulating a risk-oriented ESG indicator architecture tailored to utilities and by demonstrating how KPI–KRI design can expose and address ESG-related blind spots in existing indicator systems. The study also connects ESG indicator design with innovation trajectories such as dashboard-based monitoring, predictive analytics and AI-enabled decision-support systems for CSRD-ready utilities.

The study is limited by its reliance on published academic and sectoral sources and does not yet incorporate systematic primary data from utilities, limiting the empirical assessment of indicator usability in practice. As research in progress, the next phase will focus on empirical validation through utility-based case applications assessing whether the proposed taxonomy improves blind-spot identification, early-warning capability and the prioritisation of resilience-oriented managerial responses.

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TOURISM, WOMEN AND PEACEBUILDING IN THE GAMBIA: GENDERED INSIGHTS FOR SUSTAINABLE DEVELOPMENT

Parra-Rodriguez [1], Carmen; García-Contreras , Rogelio [2]

[1] UNESCO Chair, Abat Oliba CEU University, Barcelona, Spain

[2] Sam M. Walton College of Business, Arkansas University, USA

Keywords: Sustainable Tourism, Women's Empowerment, Peacebuilding, Gender Perspective, Community Development, Sustainable Development Goals, Social Justice

Abstract

This paper presents a conceptual model that identifies and relates the main approaches and thematic areas within the field of tourism and gender research. The model was developed through the analysis of data collected to support Gender Mainstreaming in Tourism in The Gambia, considering the intersection between women's status, the socio-cultural context, and the tourism sector.

The study adopts a qualitative and analytical approach to examine the challenges and opportunities faced by women in tourism. Based on the findings, a set of recommendations is proposed to strengthen women's employment, entrepreneurship, and leadership opportunities in the Gambian tourism industry. The recommendations are grounded in an assessment of gender inequalities, local social dynamics, and the structural characteristics of the sector.

The main contribution of this research lies in the development of a conceptual framework that integrates a gender perspective into tourism studies and facilitates the identification of priority areas for future research and policy action. The model provides a useful tool for researchers, practitioners, and policymakers seeking to promote gender equality and women's empowerment through tourism development.

The study is subject to limitations related to accessing comprehensive and reliable information on women's experiences and challenges, particularly within a socio-cultural context characterized by deeply rooted traditions and male-dominated social structures. Nevertheless, the findings offer valuable insights for advancing gender mainstreaming in tourism planning and management.

Introduction

Travel and tourism have been proven to provide women with more opportunities for empowerment compared to other industries, giving the sector's increased responsibility for the advancement of women (Inda, 2016, 47). According to the UN Global Report on Women and

Tourism by World Tourism Organization, tourism provides better opportunities for women's participation in the workforce, women's entrepreneurship, and women's leadership than other sectors of the economy. For example, the report found that women were nearly twice as likely to be employers (Ireland, 1993, p. 676) in the tourism sector than in any other industry (UNWTO, 2011).

However, women are also more likely to be involved in tourism due to the unique characteristics of the tourism sector (Kinnaird, 1996, p. 99; Figueroa-Domecq and Segovia-Pérez, 2020). The barriers to entry are low, particularly in terms of skill requirements and capital. There is less emphasis on formal education and training and greater emphasis on personal and hospitality skills (Mooney, 2020; Zhang, 2021). There are increased options for entrepreneurship that do not require heavy start-up financing. Moreover, the nature of the work can be quite flexible in terms of work hours and part-time or full-time employment (Bianchi et al., 2021). However, jobs in tourism are also likely to be low earning, businesses are smaller, less well-capitalized and informal.

The Gender Assessment of the Tourism Sector in The Gambia aims to document the existing gender disparities and key gendered challenges in tourism for inclusive economic growth in The Gambia. Tourism is the second biggest contributor to the Gambia's GDP and a key source of job creation. The assessment aims to understand women's participation in the tourism sector in The Gambia where gender gaps are among the largest in the region and the world. More specifically, it aims to demonstrate the gender disparities in participation and earnings; assess the underlying barriers and binding constraints to women's participation and better economic outcomes in tourism; and provide targeted recommendations to be incorporated into the implementation of the World Bank Tourism Diversification and Resilience in The Gambia project (P177179) as well as to create a knowledge base for future interventions.

The assessment explores key issues in women's employment, entrepreneurship and leadership within the tourism sector while examining cross-cutting factors which impact women's economic opportunities as well as their decision-making, such as policy and institutional environment, social norms, and education (Markussen and Røed (2017)). To guide policies and programmes within tourism that aim to enhance women's economic empowerment, the assessment analyzes wage employment, self-employment, and leadership in different buckets as their interventions and stakeholders could be different. And policies, social norms and education are analyzed as important contextual factors determining outcomes in three areas. In addition, the assessment unpacks the impact of diversification of tourism activities, such as eco-tourism and conference tourism, on women's economic outcomes.

Methodology

The design of the conceptual model is based on data analysis for improving Gender Mainstreaming in Tourism

Framework

The gender gap analysis examines women's participation in tourism through three lenses: Employment, Entrepreneurship and Leadership. Employment and entrepreneurship are seen as principal objectives for increasing women's participation and earnings in tourism (Kimbu and Ngoasong, 2016). They are treated separately as the stakeholders and interventions can be quite different. For example, how to encourage hotels to hire more women staff requires a different intervention than how to encourage hotels to procure from women-owned enterprises. The third pillar, leadership is seen both as an enabling factor that can support bringing about the proper policies needed to support women's employment and entrepreneurship but also a key outcome in their own right. While assessing the status of women in leadership roles within tourism and more broadly, women's presence in broader decision-making mechanisms is also taken into consideration.

The ecosystem and stakeholder assessment examines the enabling environment through three areas: policy and institutional environment, social norms, and tourism education that are cross-cutting. These are explored as the key external factors contributing to women's outcomes in employment, entrepreneurship, and leadership.

The framework identifies the key areas needed to examine barriers and binding constraints to increasing women's participation in the sector.

Data collection

The first step in the assessment was desk research. The World Bank Group's Gender Data Portal, UNDP's Gender Development Index, World Economic Forum Global Gender Gap Report, and Women Business and the Law provided useful initial background information on how The Gambia was performing on gender equality. The National Tourism Strategy, National Gender Strategy, and Country Partnership Framework provided an understanding of the broader policy landscape of the country. The assessment also took note of descriptive statistics on gender gaps shared in country surveys or in other surveys such as World Bank Enterprise Surveys.

Recent research conducted in the Gambia contributed invaluable insights to the gender assessment of the tourism sector. Some of these resources include The Gambia Poverty and Gender Assessment 2022, Policies for Sustainable and Inclusive Private Sector-led Growth:

Achieving Sustainable and Inclusive Growth The Gambia, and the Project Appraisal Document of the Tourism Diversification and Resilience in The Gambia (P177179) among others.

Following the desk research, the assessment undertook a mapping of the stakeholders with several important considerations. First, the authors identified a number of actors in the five economic activities that generate revenues and income in the tourism sector (transport, accommodations, excursions, food & beverage and shopping). Depending on the size of each sub-economic activity and the conditions in the field, the authors interviewed a representative number of stakeholders to reflect diversity of experience and opinion. In addition, relevant stakeholder suggestions by the Project Implementation Unit of the current Gambia Tourism and Resilience project were included in the list. Finally, the assessment tried to ensure a balance of female and male participants in the stakeholder meetings.

Key informant interviews and focus group discussions were conducted in The Gambia in May 2023. The 22 organizations interviewed included industry associations; training institutes; direct tourism service providers in accommodation, tour excursions, crafts sellers, hotel and restaurant personnel; enablers; development partners; and NGOs. In addition, the authors interviewed multiple hotel staff, fruit sellers, tour guides, and conducted a focus group with women entrepreneurs in different industries across the tourism value chain which was facilitated by the Gambia Women's Chamber of Commerce.

The in-person assessment also resulted in the collection of data from tourism organizations such as the Gambia Tourism Board and the Gambia Tourism and Hospitality Institute. Though available to a certain extent, finding sex-disaggregated data was a challenge throughout the assessment. The in-country assessment filled some gaps in data and provided a complementary analysis, but more data will need to be systematically collected to shed light on the issues women face in the tourism industry as well as any progress made going forward.

The assessment's focus was less on rural areas and more on urban tourism centers, though it investigated community-based tourism in rural areas which carries a potential for The Gambian tourism and women's economic opportunities. The in-person consultations mostly took place around more urbanized centers such as Serrakunda and Banjul except for a few eco lodges visited and interviewed. Even though the assessment has not conducted in-depth interviews in villages, there were interviews that took place around Kunta Kinteh Island and with the community-based tourism actors such as Institute of Travel and Tourism in The Gambia. The assessment recognizes the key linkages, especially agricultural, between the rural economy and the tourism ecosystem. Where necessary, the analysis tried to fill in the gap with the study,

Barriers to Economic Empowerment of Rural Women in The Gambia, which has a strong focus on rural women and findings from relevant key informant interviews.

Gambia Context

Tourism in The Gambia

Tourism is a major contributor to The Gambia's economy, accounting for an estimated 12–16% of GDP, supporting more than 42,000 direct jobs and 40,000 indirect jobs, and generating about US$85 million annually in foreign exchange earnings. However, the sector underperforms compared to competitors due to limited diversification of source markets, distribution channels, and tourism products. This results in strong seasonality, lower visitor spending, and greater vulnerability to economic and climate-related shocks.

Despite its rich natural and cultural assets, The Gambia remains heavily dependent on "sun and sea" tourism and has made limited progress in developing alternative segments such as ecotourism and cultural tourism. The country boasts significant biodiversity and several UNESCO-recognized heritage sites, but many tourist attractions suffer from poor maintenance and require substantial investment.

In addition, inadequate infrastructure and climate change pose major challenges. Coastal erosion threatens heritage sites such as Kunta Kinteh Island, while rising sea levels endanger both tourism assets and coastal communities, where a large share of the population lives.

Status of women in The Gambia

The Gambia continues to experience significant gender inequality, ranking low in global gender equality and human development indices. Women and girls face major barriers in education due to poverty, early marriage, and cultural norms, resulting in lower literacy rates than men. Child marriage and female genital mutilation (FGM) remain widespread despite legal efforts to address them.

Women also face economic disadvantages, including lower labor force participation, limited access to formal employment, and a high concentration in vulnerable or unpaid work. Their representation in leadership and decision-making positions remains low, reflecting persistent gender stereotypes and barriers to political participation.

Gender-based violence is a serious concern, with around one in four women experiencing physical or sexual violence from an intimate partner. Additionally, women entrepreneurs often struggle to access banking services and credit, limiting their ability to grow businesses and achieve financial independence. Overall, women in The Gambia continue to face

interconnected challenges that hinder equality, empowerment, and socio-economic development.

Tourism segments in The Gambia

By far the most predominant tourism sector, the beach—'sun and sea'—is still the main attraction for about 80 percent of tourists. The sector is heavily reliant on International Tour Operators (ITO), which bring 50–70 percent of all tourists, control 70 percent of all air access and international marketing and contribute 85 percent of all hotel revenues. (Gambia Country Partnership Framework). Tourists predominantly come from select markets in Europe particularly the UK and Netherlands. This assessment analyses women's participation in the hotels' workforce and the role of women-led businesses in the hotels' value chains.

The diversification of the tourism offering in the Gambia, especially conference tourism, eco-tourism, and community-based tourism could lead to promising economic outcomes for women, both in terms of improving women's employment and women-led MSMEs accessing new markets, contributing to inclusive economic growth opportunities (Anyanwu et al. (2013)). Due to limited diversification, distribution channels, and product offerings, Gambia currently lags behind its competitors. The diversification carries new possibilities for women's economic involvement in the sector while also broadening the sector and boosting the economy.

Eco-tourism combines well with community-based tourism, creating additional employment opportunities for women, such as birdwatching tours, cooking demos, etc. This is in line with various studies which show that women could be psychologically, socially, economically, and politically empowered by their participation in ecotourism ventures (Deori and Das, 2013; Irandu and Shah, 2014). Ninki Nakka trail, which offers community-based tourism in rural communities along the Gambia River, was designed to promote travel during the low season, between May and October. Its focus is on sustainable tourism to benefit host communities, businesses and the environment. Gambia Tourism Board has a code of conduct for Ninki Nakka Trail tour operators, both domestic and international including a condition to be an ethical business with decent employment practices, and to maintain a policy on gender equality and decent working conditions.

Research shows that developing nature-based and sustainable tourism could also help attract high-value tourism. Recent World Bank consumer research on three key European outbound markets (Germany, Sweden, United Kingdom), which are also important for the Gambian tourism, identified five market segments amongst travelers (World Bank 2022). Three of these segments, which account for 66 percent of respondents, focus on nature-based and sustainable

tourism and are the highest spending of all traveler types. These tourists actively seek distinctive experiences, aspire to connect with local communities and enterprises, view travel as a means of education, and are committed to sustainable practices. Attracting more of these tourist segments by changing the marketing strategy and increasing the supply of active, nature-based experiences, coupled with targeted strategies to employ women, could positively impact women both as producers of local goods and services but also actors in community-based and eco-tourism.

Data Analysis

Gender disparity in employment

There are five key economic activities that generate revenues and income in the tourism sector – transport, accommodations, excursions, food & beverage, and shopping and women's participation within each of these activities vary as do the explanations and the interventions needed. In all key economic activities of Gambian tourism, male workers are employed at higher numbers than women, with the gender gap smaller for part-time work in some activities. Women constitute 35 percent of all full-time employees in the tourism sector compared to 65 percent of men, with a resulting gender gap of 29 percentage points. The gender gap in employment drops for part-time work. Women comprise 42 percent and men make up 58 percent of part-time employees, resulting in a smaller gender gap of 16 percentage points.

Two-thirds of the tourism jobs are heavily concentrated on accommodation - accounting for 64 percent of men's and 58 percent of women's tourism employment. In part-time work, the gender gap in employment in accommodation drops to 3 percentage points, showing that women are more likely to be hired as part time employees in hotels and other accommodation establishments. The next largest employment area is food, beverage, and entertainment. Food, Beverage, and Entertainment account for nearly a quarter of the tourism jobs and close to one third of women's employment in the sector.

Hotels constitute more than one quarter of all accommodation jobs but only one third of hotel employees are female. They work as receptionists, waitresses, housekeeping staff or as managers in HR, finance, and marketing. They are more likely to be part-time or paid seasonal workers. Among the large hotels, data collected by one study shows that women represent on average 15 percent of the workforce, ranging from a minimum of 4 percent to a maximum of 35 percent.

Transport and Excursions are heavily male dominated. According to 2018 data, 85 percent of full time and 89 percent of part time workers in transport are male. Excursions are also male

dominated, almost all tour guides being male in the country. Being a tour guide is seen as not a possibility once a woman is married or has children, mainly for the long hours excursions may take, or if the clients are only male. However, there is female ownership of the tour operator outfits.

Gender disparity in entrepreneurship

Women show strong willingness to participate in the hospitality industry, given their enrollment rates in the tourism and hospitality institute are higher than men but this is not translating to employment in the hotel industry, due to a composition of key supply and demand-side barriers identified. Female labor force participation could remain low due to lack of skills, assets and networks, time-based constraints, limited mobility, gender discrimination in hiring and promotion, and restrictive gender norms (Halim et al., 2023). The key informant interviews suggest that women are switching to alternative jobs or self-employment due to an interplay of factors.

The restricted hours that women typically work within the tourism and hospitality sector might potentially result in a bias towards selecting male candidates over female ones. Most businesses have a policy of not hiring women for shifts after 4pm. Though this is not a legal requirement, it is a de facto practice due to a variety of cited reasons, including safety and norms. As a result, this might be leading to a preference in hiring men as there is greater flexibility in employing men for both day and night shifts.

Tourism businesses might be favoring women for part-time work over full-time work also partially due to maternity policy. Businesses in The Gambia are legally obligated to implement a 6-month paid maternity leave policy for female employees. Paid paternity leave is available up to 10 days for fathers. Some interviews suggest that this results in favoring women for part-time work or male candidates over female ones. In other countries, such as Sao Tome and Principe, this maternity leave bias is eliminated as it is social security that pays for the leave rather than the companies. The Women, Business and the Law 2023 report lists ‘laws affecting women's work after having children’ as one area for improvement to improve legal equality for women in The Gambia. Offering only leave for mothers, especially above a threshold of 30 weeks, can be correlated with fewer women in the workforce (Del Rey, Kyriacou, and Silva, 2021). Studies show that a smaller gap between mothers’ and fathers’ leave is associated with a higher female labor force participation rate.

Women’s participation in The Gambia’s tourism sector is constrained by several factors. Safety concerns during late-night travel, high transportation costs, inadequate street lighting, and limited employer-provided transport make it difficult for many women to work in the industry.

Women also often lack information, training, and prior exposure to better-paid tourism jobs, such as tour guiding, which remains a male-dominated occupation.

Seasonal employment further limits women's participation, as many are hired on part-time contracts and may not have income throughout the year. Consequently, many women turn to self-employment to secure year-round earnings and gain greater flexibility over their working hours.

Micro, Small, and Medium Enterprises (MSMEs) are a major source of employment in The Gambia, contributing around 20% of GDP and employing about 60% of the urban workforce. However, although self-employment is common among women, female-owned businesses tend to be smaller, employ fewer people, and generate lower profits than male-owned businesses. Most female-led enterprises are one-person businesses, and women earn significantly lower median monthly profits than men, highlighting persistent gender gaps in entrepreneurship and economic opportunities.

As the literature shows, gender gap in business performance is attributed to the gender-related limitations that women encounter when initiating, maintaining, and expanding their businesses. In Sub-Saharan Africa, women are more likely to be entrepreneurs than men, and yet their businesses earn only two-thirds the profits of their male-owned counterparts (World Bank 2019). The significant gender gap in earnings is not a result of inherent variations in the skills of male and female entrepreneurs. Instead, there are multiple underlying contextual constraints such as legal discrimination, social norms, and risk of gender-based violence; endowments such as education/skills, confidence/risk preferences, finance and assets, and networks and information; and, finally, household-level constraints such as care and allocation of factors of production (World Bank 2019).

Increased revenue of tourism-related MSMEs is a key country priority as also indicated in the Country Partnership Framework. The MSMEs within the sectors of accommodation, food and beverage, and travel and tours have exhibited a higher level of economic activity. Nevertheless, the presence of exclusive agreements between international tour operators (ITOs), accommodation providers, and ground tour operators has limited the potential for numerous MSMEs to partake in the existing tourism value chain. Furthermore, the impacts of COVID-19 have rendered many businesses in the tourism sector susceptible to concurrent shocks in both supply and demand.

Women are crafts sellers, beach fruit sellers, tour operators and restaurant owners and contribute indirectly to the tourism sector as vegetable and food suppliers, with their catering, beauty & skin care, and fashion businesses. Economic activities in the tourism industry are

often intertwined with other sectors. The transport sector is heavily male dominated. There is a large share of women participation in the crafts market, however mainly for beaded jewelry, cloth, and basket. In beauty, there is an increasing number of women entrepreneurs who use the local plants/trees of the country to make oils, such as baobab oil.

Leadership and decision-making

Women's participation in decision-making and leadership remains low in The Gambia. While the United Nations at the 1995 Beijing Conference on Women set a gender quota of 30 percent for women's representation in decision-making processes, the actual representation of women in leadership roles falls far below this standard (Segovia-Pérez et al. 2019). Women constitute only 8.6 percent of the parliament while 91 percent of the parliamentarians are men, ranking The Gambia 168th out of 186 countries worldwide. This falls behind the Sub-Saharan Africa average as well as the world average. In the executive, only 3 of the 22 Ministers in the current Cabinet are women, at the local level eight out of 120 councilors are female, and among traditional council leadership only 13 of the 1,887 Alikaalo are female. Women represent a full 57 percent of the registered electorate in The Gambia but they play mostly supporting roles, e.g., as voters and party organizers and mobilisers. Often, when a woman and a man want to run for the same political party, the woman is asked to step aside to make room for the man.

Leadership positions at the upper echelons of companies are lacking in terms of female representation (Moreno Alarcón, 2018). According to World Bank Enterprise Surveys in 2018, only 10 percent of firms have a female top manager and 17 percent of all firms have female participation in ownership. These are significantly lower than the SSA average which is 16 percent for top management and 31 percent for female ownership.

None of the leading tourism organizations in the ecosystem are headed by women, though women have presence at other levels. Even though tourism globally provides better opportunities for women's leadership than other sectors of the economy, none of the key public tourism players such as Gambia Tourism Board, Gambia Tourism and Hospitality Institute, and NCAC are headed by women. On the private sector side, female representation has been better. There is some female presence among General Managers of hotels, approximately 3-4 out approximately 40 hotels are women. Aside from GMs, women are often managers in back-office positions such as accounting and sales. Additionally, the Gambia Hotel Association and the Gambia Travel and Tourism Association have had women in leadership at various times in their history.

Gender norms, discrimination and stereotypes also combined with forms of gender-based violence, such as sexual harassment, are some of the factors which contribute to keeping women

from leadership positions. In the Gambia, about three-quarters (74%) of citizens say women should have the same chance as men to run for political office. Especially economically better-off citizens (86%) and those with post-secondary education (84%) are more likely to agree with this view. However, 60 percent of Gambians think that if a woman runs for a public office, she will be likely criticized or harassed by others in the community, and 40 percent think she will probably face problems with her family. Cultural phenomena have created the stereotype "impression that men are superior and women are inferior" and a "socialization process [that] has also led men and women to perceive men as leaders and women as supporters". These perceptions are alleged to "put women in the private sphere as wives, mothers and daughters and men in the public domain of decision-making", as well as the economic and political arena.

Conclusion

To strengthen gender mainstreaming in The Gambia's tourism sector, a comprehensive set of recommendations has been identified across employment, entrepreneurship, leadership, and public policy. Increasing women's participation and earnings in tourism requires addressing financial, social, and cultural barriers while creating safer and more inclusive workplaces.

Key actions include recognizing hotels that promote gender equality, implementing anti-harassment measures, improving women's access to training and job placements, and expanding management and technical skills development to support women's career advancement.

Women-owned businesses also face challenges related to limited market access and skills gaps. To address these constraints, efforts should focus on strengthening links with tourism value chains, facilitating partnerships with hotels and retailers, improving product quality and marketing, expanding opportunities in crafts and tourism-related services, promoting digital platforms and e-commerce, and providing both technical and entrepreneurial training. Advancing gender equality in tourism further requires stronger leadership, better data collection, and supportive policies. Priorities include increasing the representation of women in tourism-related institutions, collecting gender-disaggregated data, promoting best practices in gender-inclusive businesses, expanding community-based tourism opportunities, strengthening legal protections against workplace harassment, and improving mechanisms to address gender-based violence within the tourism sector.

Together, these measures aim to create a more inclusive, diverse, and equitable tourism industry in The Gambia, fostering women's economic empowerment and expanding access to sustainable opportunities.

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EXPLORING THE SYNERGIES OF CIRCULAR ECONOMY AND ARTIFICIAL INTELLIGENCE: STATE OF DEVELOPMENT AND A COMPREHENSIVE RESEARCH AGENDA

Vásquez Neyra, Jessika Milagros[1,2]; Ferasso, Marcos[3,4]; Kirchherr, Julian[5,6,7]

[1] Pontificia Universidad Católica del Perú, Lima, Peru

[2] CENTRUM Católica Graduate Business School, Lima, Peru

[3] Intrepid Lab, Lusófona University, Lisboa, Portugal

[4] Grupo de Investigación de Estudios Organizacionales Sostenibles, Universidad Autónoma de Chile, Santiago, Chile

[5] Department of Social Sciences and Business, Roskilde University, Roskilde, Denmark

[6] Innovation Studies Group, Copernicus Institute of Sustainable Development, Utrecht University, Utrecht, The Netherlands

[7] Cambridge Centre for Environment, Energy and Natural Resource Governance, University of Cambridge, UK

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Introduction

The transition toward a Circular Economy (CE) increasingly relies on emerging technologies to close resource loops. Artificial Intelligence (AI) is positioned as a key enabler of this shift, yet the intellectual structure of the AI–CE nexus remains fragmented, as existing reviews tend to address individual Industry 4.0 technologies in isolation rather than AI–CE synergies specifically.

Purpose, Aim and Objectives

This study aims to comprehensively map the AI–CE nexus by combining bibliometric analysis, network mapping, and qualitative synthesis. It addresses two questions: What is the current knowledge structure of AI–CE integration in the business and environmental management literature? How can AI support and enhance CE practices? The study seeks to identify dominant themes, applications, and gaps, and to propose a research agenda.

Literature Review and Theoretical Framework

The study is grounded in Circular Economy theory and its evolving 'R' strategies (Kirchherr et al., 2017), sustainability transition theory (Geels, 2002), and responsible innovation (Stilgoe et al., 2013). While AI is widely adopted across organisational functions, its integration into CE strategies remains under-theorised, particularly regarding energy footprint, regulatory fragmentation, and rebound effects (Dwivedi et al., 2023).

Methodology and Methods

Data were retrieved from Scopus using a Boolean search combining "circular economy" and "artificial intelligence", restricted to English-language articles and reviews from 2021 onward (322 documents). A three-step filtering process – quality screening, manual review, and metadata export – produced a final sample of 21 documents. Co-citation network analysis (CiteSpace) identified 36 nodes and 375 links across four clusters, followed by an inductive qualitative synthesis (Patton, 1990).

Main Findings and Contribution

Three interconnected domains emerge: responsible and efficient production, responsible consumption and product life-cycle extension, and ethics, governance, and regulation of AI in circular systems. Key applications include generative design, predictive maintenance, computer vision-based recycling, reverse logistics optimisation, and digital traceability. Persistent challenges include the energy intensity of AI systems, high implementation costs, data limitations, and regulatory fragmentation.

Originality and Value

Unlike prior reviews examining single Industry 4.0 technologies in isolation, this study is among the first to apply a comprehensive multi-method approach – integrating bibliometric evidence, network structure, and qualitative interpretation – specifically to the AI–CE nexus, clarifying how AI technologies interconnect across circular value chains.

Research Limitations

The small final sample (21 documents) reflects the nascent state of the AI–CE field and reliance on a single database, which may limit generalisability. Future research could broaden database coverage and incorporate empirical validation through case studies.

Theoretical and Practical Implications

Theoretically, the findings refine socio-technical transition and responsible innovation frameworks. Practically, the study guides scholars, practitioners, and policymakers seeking to scale AI-enabled circular solutions through energy-efficient AI architectures and adaptive, anticipatory governance mechanisms.

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THE ROLE OF STAKEHOLDERS IN SUSTAINABLE FOOD TECH ENTREPRENEURIAL ECOSYSTEMS. A CASE STUDY OF ECOROBOTIX.

Iaia, Lea[1]; Scuotto, Veronica[2]; Sangineto, Mariapia[1]; Canavesio, Davide[1]; Pironti, Marco[1]

[1]University of Turin, Turin, Italy

[2]University of Naples Federico II, Naples, Italy

Keywords: *Entrepreneurial ecosystems, Stakeholder theory, Sustainable entrepreneurship, Theory elaboration, B-Corp.*

Abstract

Entrepreneurial ecosystem research explains how institutional and resource conditions support productive entrepreneurship, but it has not systematically and explicitly incorporated sustainability. This gap is especially relevant in sustainable food tech, where entrepreneurial activity is shaped by ecological goals, regulation, legitimacy, and broad stakeholder involvement. Building on stakeholder theory, this paper investigates whether sustainability may act as a systemic modifier of entrepreneurial ecosystems through stakeholder relationships. Using a theory-elaborating qualitative single-case design, the study examines Ecorobotix, a Swiss firm operating in precision agriculture within the broader agrifood system. Based on secondary data, the analysis provides a first exploratory mapping of how sustainability appears to influence the relational logic of the ten ecosystem components identified by Stam and van de Ven (2021). More specifically, the case suggests that sustainability may broaden the relevant stakeholder base, diversify the forms of value exchanged, and reshape how ecosystem components interact. The paper contributes to entrepreneurial ecosystem research by proposing a sustainability-oriented extension of the ten-component model, to sustainable entrepreneurship research by offering a more systematic ecosystem-level interpretation of sustainability, and to stakeholder theory by applying it beyond the firm level to the ecosystem as a whole. Given the exploratory nature of the study, the findings should be understood as a first analytical step and a foundation for future interview-based inquiry.

Introduction

One of the relevant lenses for explaining why some ventures emerge, grow, and scale more

successfully than others is the entrepreneurial ecosystem. Its success relates to the emphasis this perspective gives to the broader configuration of institutions, resources, networks, culture, leadership, and support structures surrounding entrepreneurial actors (Isenberg, 2010; Stam, 2015; Stam and van de Ven, 2021; Khatami et al., 2022), rather than attributing entrepreneurial outcomes solely to individual talent or firm-level strategy. Among the available frameworks, Stam and van de Ven (2021) developed a model that offers a structured and empirically grounded account of how ten interdependent ecosystem components jointly support productive entrepreneurship.

At the same time, the growing relevance of sustainability-oriented entrepreneurship raises an important question for ecosystem research, as in sectors linked to the agrifood transition, sustainability is not simply an external concern or a reputational add-on. It can shape technological priorities, regulatory exposure, legitimacy processes, investor expectations, market demand, and the range of actors involved in venture development (Hall, Daneke, and Lenox, 2010; Schaltegger and Wagner, 2011). This suggests that sustainability may influence not only the goals of entrepreneurial activity, but also the way entrepreneurial ecosystems are organized and function, but existing research has addressed this issue only partially. Studies on sustainable entrepreneurship have shown that sustainability-oriented culture and stakeholder support matter for entrepreneurial activity (Bischoff, 2019; Simatupang et al., 2015). Khatami et al. (2022) examine how the European entrepreneurial ecosystem influence sustainable innovation. However, the literature has not yet systematically explained whether and how sustainability may reshape the internal logic of entrepreneurial ecosystems across their components. This gap is particularly important in sustainability-intensive contexts, where entrepreneurial action depends on the coordination of diverse actors around both economic and ecological objectives.

Stakeholder theory provides a useful interpretive lens for addressing this gap. By emphasizing value creation through relationships with multiple stakeholders, it helps explain how organizations operate in settings where legitimacy, knowledge, trust, regulation, and shared purpose are central to performance (Freeman, 1984, 1999; Mitchell et al., 1997; Jones and Wicks, 1999; Trevino and Weaver, 1999). In sustainability-oriented ventures, relevant stakeholders extend beyond customers and investors to include regulators, research institutions, certification bodies, intermediaries, communities, and environmental actors. This broader relational field proposes that sustainability may affect not only who matters in the ecosystem, but also the forms of value exchanged within it. This paper explores this possibility by examining the entrepreneurial ecosystem of Ecorobotix, a Swiss company operating in precision agriculture and oriented toward the reduction and replacement of chemical inputs. Through this investigation, the aim is discovering how stakeholder relationships shape the entrepreneurial ecosystem of a sustainable agrifood venture, and whether

sustainability may act as a systemic modifier of ecosystem components. Building on the entrepreneurial ecosystem model of Stam and van de Ven (2021) and using stakeholder theory (Freeman, 1984) as an interpretive extension, the paper argues that sustainability may alter the relational logic of existing ecosystem components instead of simply add a new one. Methodologically, the study adopts a qualitative single-case, theory-elaborating design based on secondary sources (Fisher and Aguinis, 2017; Yin, 2003). It offers an initial analytical mapping of how sustainability appears to influence stakeholder relationships across the ten ecosystem components. In doing so, the paper contributes to entrepreneurial ecosystem research, sustainable entrepreneurship research, and stakeholder theory, while also laying the groundwork for future interview-based investigation.

Literature review

Discovering entrepreneurial ecosystems

Entrepreneurship research has long been led by an individualistic perspective, underlining the entrepreneur's personal traits as the main factor influencing their success. This perspective emphasizes individual agency, including risk propensity, inventiveness, and entrepreneurial spirit (Schumpeter, 1934, cited in Stam and van de Ven, 2021), but it is unable to explain why entrepreneurs with similar capabilities achieve different results, depending on the context in which they operate or why some regions consistently produce more entrepreneurship than others. Entrepreneurship is a collective accomplishment that lies in the actions of individual entrepreneurs but also necessitates active roles from actors in both the public and private sectors to create an industrial infrastructure that supports innovation (Stam and van de Ven, 2021). This limitation encouraged further research, moving the focus from the individual to the wider system of institutions, resources, and relationships that characterize the entrepreneurial activity (Aldrich, 1990; Steyaert and Katz, 2004). Indeed, the entrepreneurial ecosystem perspective emerged to address this issue. Van de Ven (1993) made a fundamental contribution in this direction by proposing the idea of a "infrastructure for entrepreneurship" consisting of four main elements, such as market demand from knowledgeable consumers; institutional arrangements that legitimize and encourage entrepreneurial activity; public resource endowments that include scientific knowledge, financing mechanisms, and pools of skilled labour; and proprietary business activities carried out by private entrepreneurs. This formulation foresaw the systemic nature of entrepreneurship, highlighting that entrepreneurship is a collective endeavour since individual entrepreneurs cannot independently address all the institutions and resources needed to develop and commercialize their

ventures. The ecosystem paradigm was gradually embraced by academics and professionals in the following decades to characterize the geographical settings where entrepreneurship thrives (Moore, 1993; Acs, Stam, Audretsch, and O'Connor, 2017). Isenberg (2010) proposed a framework consisting of six domains, namely policy, finance, culture, support, human capital, and markets, with the aim of creating an environment that would facilitate entrepreneurship. Feld (2012) highlighted the relational aspect of ecosystems, stressing the significance of network density, connecting events, and cooperation between large firms and startups. Despite becoming extremely influential among policymakers and practitioners, these contributions were criticized by academic scholars and produced what Stam (2015) described as "laundry lists" of relevant factors, lacking a clear causal logic connecting ecosystem conditions to entrepreneurial outcomes. Stam and van de Ven (2021) proposed a systems framework composed of ten interdependent ecosystem components grouped into institutional arrangements and resource endowments. Their model highlights three core dynamics: co-evolution among ecosystem elements, the influence of overall ecosystem quality on productive entrepreneurship, and feedback effects from entrepreneurial success back into the ecosystem.

This model is particularly relevant for the present study because it provides the most structured and empirically grounded architecture currently available for analyzing entrepreneurial ecosystems. Although the model explains the structural conditions supporting productive entrepreneurship, it does not specify how sustainability may reshape the internal logic of ecosystem components.

Stakeholder Theory as an interpretive lens

According to stakeholder theory (Freeman, 1984; Freeman, Harrison, and Wicks, 2007; Jensen, 2001), an organization’s long-term success depends on its capacity to generate value for a variety of stakeholders, including workers, customers, investors, local communities, and the environment. It has inspired a variety of perspectives that all claims that stakeholders influence business performance by their moral legitimacy and vice versa businesses need to satisfy stakeholders’ interests (Jones and Wicks, 1999; Trevino and Weaver, 1999). Civera, Moggi, Chiaudano, and Freeman (2025) have recently expanded on this relational understanding by conceptualizing how stakeholder relationships evolve across various engagement approaches in sustainability-oriented contexts, ranging from informative to reciprocal, advocative, and ecosystemic. This concept supports the idea that stakeholder relationships involve several levels of value, purpose, and mutual interdependence and cannot be reduced to transactional trades in environments where ecological and social goals are paramount. In turn, it leverages the relevance of a stakeholder on others (Mitchell et al., 1997).

Value creation within an ecosystem is not a zero-sum process (Erina et al., 2017), nor can it be reduced to economic return alone. Different stakeholders may exchange and receive economic, intangible, intrinsic, and transcendent forms of value, many of which emerge through cooperative and relational processes, not just through market transactions (Argandoña, 2011; Erina et al., 2017). This perspective is especially relevant for sustainable entrepreneurship (Spence et al., 2011; Schaltegger and Wagner, 2011), because sustainability-oriented ventures interact with a broader and more heterogeneous stakeholder base than conventional firms, including environmental regulators, civil society actors, certification bodies, impact investors, and research partners. Sustainability may therefore alter not only who matters in the ecosystem, but also the kinds of value exchanged and the relational mechanisms through which ecosystem components operate (Bischoff, 2019). Using the triple helix model of university-industry- government interactions, Erina et al. (2017) further show that ecosystems generate greater value in contexts characterized by sophisticated institutional networks, whereas synergistic benefits are less likely to emerge where network architecture is weak. In this sense, stakeholder theory complements the structural strength of the entrepreneurial ecosystem approach with a more relational understanding of how sustainability-oriented ecosystems function in practice.

Sustainable entrepreneurship and the ecosystem research

A second relevant stream of literature concerns sustainable entrepreneurship. One of the first contributions to explicitly include sustainability within the ecosystem paradigm was Cohen (2006). The term “eco-preneurship” was first used by Schaltegger (2002), who highlighted the role of environmentally conscious entrepreneurs as catalysts for long-term economic change. According to Hall, Daneke, and Lenox (2010), sustainable entrepreneurship is essential to the transition toward a more sustainable economy. More recently, Bischoff (2019) conducted one of the first comparative studies of sustainable entrepreneurial ecosystems and found that entrepreneurial cultural awareness and stakeholder support and collaboration specifically focused on sustainability are key predictors of perceived ecosystem strength. This finding is important because it suggests that general support for entrepreneurship does not replace support explicitly oriented toward sustainability. In a similar vein, Simatupang, Schwab, and Lantu (2015), as discussed by Bischoff (2019), emphasized the significance of stakeholder support and involvement in the development of effective sustainable entrepreneurial ecosystems. More recently, Filippelli, Troise, Bigliardi, and Corvello (2025) demonstrate how stakeholders, such as governments, universities, and big businesses, actively push startups toward economic, social, and environmental goals at the same time, further demonstrating that sustainability and economic growth can coexist within

entrepreneurial ecosystems.

Taken together, these studies suggest that sustainability may affect multiple ecosystem dimensions, including culture, stakeholder support, legitimacy, and coordination. However, they do not yet provide a systematic account of whether and how this influence extends across the full ten-component architecture proposed by Stam and van de Ven (2021). Nor do they explain, through a single analytical framework, how stakeholder relationships may shape sustainability-oriented entrepreneurial ecosystems in the food tech sector. This is the gap addressed by the present study.

The Research Framework

The paper adopts the model developed by Stam and van de Ven (2021) as its structural baseline. The model identifies ten observable components that are mutually dependent and co- evolutionary (Proposition 1), and their combined quality determines productive entrepreneurial capacity (Proposition 2), with previous successes feeding back into the system (Proposition 3). Its core insight is that entrepreneurial performance cannot be explained by isolated factors, because ecosystem elements are interdependent and mutually reinforcing, providing a robust structural account of how entrepreneurial ecosystems operate over time. Nevertheless, it remains under-specified with regard to sustainability, particularly in relation to stakeholder composition, value exchange, and the internal logic of ecosystem components.

To address this limitation, the stakeholder theory is used as an interpretive extension of the ecosystem model. It explains how organizations generate value through relationships with multiple actors rather than through shareholder-oriented economic exchange alone. In sustainability-oriented settings, this relational perspective becomes especially important, since relevant stakeholders extend beyond conventional market actors and include regulators, environmental organizations, certification bodies, sustainability-focused investors, research institutions, and communities affected by ecological outcomes. Applied at the ecosystem level, stakeholder theory makes it possible to examine not only which actors populate each component, but also what kinds of value circulate through those relationships. This includes economic value, but also intangible value such as legitimacy, knowledge, and trust, intrinsic value linked to purpose and identity, and transcendent value connected to wider environmental and societal goals. In this way, stakeholder theory complements the structural logic of the ecosystem model with a relational and value-based logic.

Building on these two theoretical pillars, the paper proposes that sustainability may modify the

internal logic of all ten components by broadening the relevant stakeholder base, changing the forms of value exchanged, and intensifying interdependencies among components. Existing literature already suggests parts of this argument—for example, in relation to sustainability-oriented culture and stakeholder support—but has not systematically mapped it across the full ecosystem architecture.

Methodology

This paper uses a qualitative single case study design within the theory elaboration perspective (Yin, 2003). Research questions of the "how" and "why" types that aim to comprehend complicated phenomena in their real-world context are especially well-suited to the case study technique. According to Fisher and Aguinis (2017), qualitative case-based designs have been used in many of the most influential theory elaboration studies because they enable researchers to identify constructs and relations that would be invisible to purely quantitative approaches and to get close to empirical reality. More specifically, three requirements identified by Fisher and Aguinis (2017) are met in this study. The entrepreneurial ecosystem model of Stam and van de Ven (2021) offers a well-validated structural account of the conditions enabling productive entrepreneurship, but it does not systematically incorporate sustainability as a structural dimension. This is the first theory that partially explains the focal phenomenon. Second, the current explanation is insufficient because, as the literature review shows, sustainability has been recognized as pertinent to entrepreneurial ecosystems but has not been systematically incorporated into the ten-component model, creating a theoretical gap that this paper aims to fill. Third, there is the possibility of gathering data from an empirical setting to incorporate with current theory. For example, the case of Ecorobotix offers a well-documented example of a sustainable precision agriculture company functioning within a complex stakeholder ecosystem, allowing the development of current theory through the strategies of specific relation structuring and new construct specification (Fisher and Aguinis, 2017).

Through theoretical sampling, Ecorobotix was chosen as the empirical case (Eisenhardt, 1989), for its theoretical significance (Yin, 2003). Ecorobotix simultaneously meets four requirements for selection. First, it works in the industry domain of this article, which is the food technology sector, in particular the precision agriculture within the agrifood system. Second, its initial objective of lowering, replacing, and regenerating chemical inputs in agriculture and its B-Corp certification, which was gained in 2019 and reaffirmed in 2023, reflect its stated, verifiable, and continuous sustainability approach. Third, it has grown to such an extent that it has established meaningful, documented relationships with a wide range of ecosystem stakeholders. It operates in more than 20

countries, employs more than 200 people, and has raised more than $150 million over several funding rounds. Fourth, it is integrated within the well-established institutional and innovative backdrop of the Swiss entrepreneurial ecosystem. It is agreed that Ecorobotix is part of a supportive national environment and is a reasonably developed and well-funded case. However, according to Yin (2003), this makes it a revelatory case in the sense of theory elaboration: because its sustainability orientation is institutionally embedded and its stakeholder relationships are well-documented, it makes it possible to observe patterns and mechanisms that would be invisible in ecosystem contexts that are less developed or at an earlier stage. Analytical generalization, or the expansion and improvement of theoretical claims, is the goal here rather than empirical generalization (Yin, 2003; Fisher and Aguinis, 2017). A well-selected extreme or revelatory case might contribute more to theory building than a representative one, according to Flyvbjerg (2006), who contends that the purpose of case study research is not statistical representativeness but rather the depth of insight it enables.

The company's official website, together with complementary publicly available documents such as press releases, investor-related materials, certification-related information, and partnership documentation, were used as secondary sources for data collection. This strategy aligns with Yin's (2003) suggested archive method for case studies aimed at producing a theoretical extension. The available documentary evidence is used to identify salient stakeholder categories, relationships, and value exchanges that can support an initial analytical mapping of the ecosystem. The structural strategy of theory elaboration (Fisher and Aguinis, 2017) guided the deductive template analysis process used for data analysis (King, 2004). The main analytical template was the ten ecosystem components defined by Stam and van de Ven (2021), while the interpretative lens was Freeman's (1984) Stakeholder Theory. Three questions guided the analysis for each component: *who are the stakeholders in that component; what kind of value is exchanged in that relationship (economic, intangible, intrinsic, or transcendent); and how does Ecorobotix's sustainability orientation alter the relational logic of that component in comparison to what a traditional, non-sustainability-oriented ecosystem model would predict*. These questions were used to structure a first-stage analytical exploration of whether sustainability appears to broaden the stakeholder base, diversify the forms of value exchanged, and modify the logic of interaction across the ten components. This process therefore operationalizes the paper's proposition as an exploratory analytical guide and makes it possible to identify preliminary patterns, tensions, and relational mechanisms to be examined more deeply in subsequent interview-based research.

Findings and Discussion

In the analysis that follows, the integrated theoretical framework is applied to Ecorobotix, a Swiss precision-agriculture firm founded by Steve Tanner and Aurélien Demaurex in 2014 and guided by the "Reduce, Replace, Regenerate" goal. The following figure summarises the main findings presented in this section.

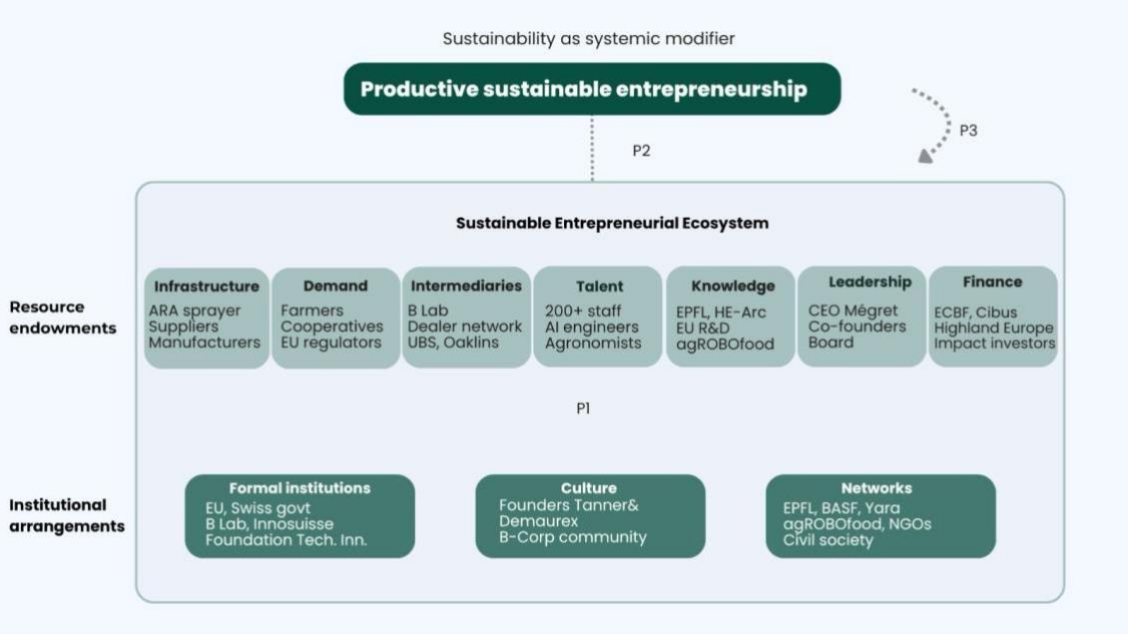


Figure 1. *The entrepreneurial ecosystem of Ecorobotix. Source: our elaboration*

Formal Institutions. Early governmental funding from the Swiss Foundation for Technological Innovation in 2014 gave the business legitimacy at the outset. The company's technology faces structural regulatory pressure due to the EU Farm to Fork Strategy, which calls for a 50% decrease in pesticide use by 2030. B Lab confirms and disseminates the company's environmental performance through B-Corp accreditation. Taken together, these publicly documented institutional relationships suggest that sustainability is not merely a voluntary orientation but is embedded in broader regulatory and legitimizing structures. This result is consistent with recent research demonstrating that institutional support and government initiatives are important factors in the development of sustainable entrepreneurship, especially when they integrate ecosystem-building initiatives, legitimizing structures, and regulatory frameworks (Ben Chikha, Salloum, El Hilali, and Jarboui, 2025). These institutional stakeholders appear to convert sustainability from a personal choice into a structural market condition by exchanging primarily intangible and transcendent value, such as legitimacy, normative direction, and regulatory frameworks (North, 1990; Bischoff, 2019).

Culture. The company's beginnings are clearly based on a common ecological concern, and the two

founders met at an event for environmental conservation. This founding culture is formally institutionalized through the "Reduce, Replace, Regenerate" objective and the yearly B Impact Assessment. According to Bischoff (2019), Ecorobotix suggests that sustainability awareness and entrepreneurial consciousness coexist as complementary dimensions from the beginning, founders and employees appear to exchange intrinsic and transcendent value, understood as the personal meaning associated with contributing to ecological change. However, the ways in which these actors themselves articulate and experience such motivations remain an open question for future interview-based research.

Networks. Early knowledge infrastructure was supplied by academic collaborations with EPFL and HE-Arc, and the company's involvement in the EU agROBOfood project expanded its reach to a pan-European innovation network. Most importantly, despite manufacturing goods that Ecorobotix's technology partially replaces, corporate investors BASF Venture Capital and Yara Growth Ventures-incumbent agrochemical actors-take part. In line with Freeman's (1984) forecast that stakeholder value creation transcends zero-sum competitive logic, this can be interpreted as evidence consistent with a sustainability-driven reconfiguration of competitive relationships into cooperative ones.

Finance. The European Circular Bioeconomy Fund (ECBF), Cibus Capital, McWin Capital Partners, Flexstone Partners, and Stellar Impact are among the investors. These investors are sector-specific or impact-oriented, and their decision-making criteria specifically take into account both financial performance and quantifiable environmental returns. In line with Meyskens and Carsrud's (2013) prediction, the Series C ($45M, 2024) and Series D ($105M, 2025) of funding investment rounds suggests, that sustainability changes the standards governing access to financing by reflecting a potentially different financial logic in which capital flows toward both ecological outcomes and financial return.

Knowledge. Developed in partnership with EPFL and EU-funded research programs, more than 25 crop-specific AI algorithms represent a knowledge agenda influenced by ecological values rather than just productive efficiency. Research on substituting natural acids for synthetic chemicals in organic farming markets further demonstrates how sustainability reroutes knowledge creation toward issues that are not visible in traditional agtech models, creating asymmetries that favor businesses with specialized sustainability expertise (Schaltegger and Wagner, 2011). This indicates that sustainability may shape not only what knowledge is produced, but also which knowledge trajectories become strategically valuable.

Leadership. With a background in venture capital at Swisscom Ventures, CEO Dominique Mégret, who was appointed in 2024, appears to illustrate an ecosystem connector role. He appears to act as

a mediator between the public, non-profit, and for-profit sectors and to translate a long-term sustainability vision into coordinated commercial action. Since good leadership fosters systemic cooperation that no one player could do on their own, the value traded appears to be transcendent for the ecosystem and intrinsic for the leadership team (Simatupang et al., 2015).

Talent. According to Spence et al. (2011), Ecorobotix's workforce has grown from 30 in 2020 to over 200 in 2024. This growth may indicate the ability to attract experts driven by both financial reward and a sense of purpose and ecological impact. The sustainability mission appears to broaden the standards by which people choose employers, changing the internal organizational culture as well as the makeup of the talent pool. The traded value seems to include an internal and transcendent motivational component, while its economic component is extrinsic. However, this interpretation remains preliminary and would require interview-based evidence to assess how employees themselves articulate these motivations.

Demand. Demand for Ecorobotix's technology appears to be shaped both by regulatory developments, such as the EU Farm to Fork Strategy, and by market-based considerations, including farmers' search for cost savings and operational efficiency. Agricultural cooperatives and institutional customers may therefore be influenced by both ecological and economic considerations. This dual demand structure suggests that, in sustainability-oriented settings, demand may be partially normatively shaped and not driven exclusively by conventional market mechanisms (Hall, Daneke, and Lenox, 2010).

Physical Infrastructure. Infrastructure decisions influenced by environmental standards are reflected in the ARA sprayer, a tractor-pulled device with a foldable six-meter frame made for compatibility with current farm equipment. In addition to operational efficiency, regulatory and environmental restrictions on autonomous machinery also played a role in the decision to switch from the autonomous AVO robot to a tractor-pulled system. This suggests that environmental and regulatory considerations are incorporated into infrastructure design choices from an early stage, rather than being addressed as ex post constraints.

Intermediaries. Investors, clients, and partners are informed about the company's sustainability credentials by B Lab. Through co-marketing, training, and on-farm demonstrations, the dealer network converts the sustainability value proposition into commercially viable connections with end users. Financial advisors Oaklins France and UBS Growth Advisory helped the business find investors who shared its commitment to sustainability. Unlike traditional ecosystem intermediaries, these specialized intermediaries appear to help make ecological value readable, believable, and scalable across various stakeholder populations (Howells, 2006).

The analysis shows a recurring trend across all 10 components. Ecorobotix's sustainability

orientation is associated with stakeholder interactions whose logic extends beyond purely commercial exchange and includes intangible, intrinsic, and transcendent forms of value (Erina et al., 2017). Across the case, sustainability appears to shape multiple dimensions of ecosystem functioning, including legitimacy, coordination, knowledge creation, financing logics, demand formation, and intermediation. Taken together, these patterns provide preliminary support for identifying a proposition consistent with the view that sustainability may operate as a systemic modifier of the entrepreneurial ecosystem. Therefore, the present study advances the following proposition:

In entrepreneurial ecosystems characterized by a strong sustainability orientation, greater diversity in the stakeholder base will be positively associated with greater diversity in the forms of value exchanged among ecosystem actors. Ecosystems involving a broader and more heterogeneous range of stakeholders are expected to display value-exchange configurations that extend beyond economic value, including social, ecological, intrinsic, and transcendent forms of value that are less prominent or less differentiated in conventionally oriented entrepreneurial ecosystems.

This proposition represents a first step, an analytical guide for examining whether and how sustainability appears to reconfigure ecosystem components in the selected case study; it will be refined through in-depth interview-based inquiry.

Conclusions

This paper explored the role of stakeholder relationships in the entrepreneurial ecosystem of a sustainable food tech venture by combining the entrepreneurial ecosystem model of Stam and van de Ven (2021) with Stakeholder Theory (Freeman, 1984). Using Ecorobotix as a case study, the study examined whether sustainability may act as a systemic modifier of entrepreneurial ecosystems, not as a marginal or isolated factor.

The analysis suggests that sustainability may influence entrepreneurial ecosystems by reshaping how existing components function and interrelate. Rather than adding a separate element to the ecosystem, sustainability appears to operate as a cross-cutting relational logic that broadens the relevant stakeholder base and diversifies the forms of value exchanged. In this sense, the paper offers preliminary analytical support for extending the ten-component model of Stam and van de Ven (2021) in a sustainability-oriented direction, providing a further proposition sustainability-oriented.

The study makes three main theoretical contributions. It contributes to entrepreneurial ecosystem

research by proposing that sustainability may reconfigure the internal logic of ecosystem components through stakeholder relationships (Stam and van de Ven, 2021). For sustainable entrepreneurship research, the research provides a more systematic ecosystem-level interpretation of how sustainability may shape entrepreneurial contexts beyond the established themes of culture and stakeholder support (Bischoff, 2019; Simatupang et al., 2015). Lastly, it contributes to stakeholder theory by applying it at the ecosystem level and showing that coordination in sustainability-oriented settings may involve not only economic value, but also intangible, intrinsic, and transcendent forms of value (Freeman, 1984; Erina et al., 2017).

The paper also has practical implications. For entrepreneurs, it suggests that sustainability should be treated not only as a mission statement but as a strategic organizing logic affecting access to legitimacy, partnerships, finance, and demand. For investors, it highlights the importance of evaluating ventures also in terms of their capacity to mobilize stakeholders around sustainability-oriented outcomes. For policymakers and ecosystem builders, it indicates that support for sustainable entrepreneurship may be more effective when regulation, innovation policy, certification systems, and market formation processes are aligned (Bischoff, 2019). Intermediaries also emerge as important actors in making sustainability value legible across heterogeneous stakeholder groups (Howells, 2006).

Despite the several contributions, the study has important limitations. It relies on secondary sources and therefore captures a document-based representation of stakeholder relationships instead of on the direct perspectives of ecosystem participants. It is also based on a single case, which supports theory elaboration but limits empirical generalization (Fisher and Aguinis, 2017; Yin, 2003). In addition, Ecorobotix is a relatively mature and well-funded venture embedded in a supportive national ecosystem, so the observed dynamics may not apply in the same way to earlier-stage firms or weaker ecosystems. Therefore, future research should extend this first step through in-depth interviews with founders, employees, investors, customers, intermediaries, and institutional actors, in order to validate, refine, or challenge the patterns identified here. Comparative and longitudinal studies would also help clarify under what conditions sustainability becomes a systemic modifier of entrepreneurial ecosystems (Fisher and Aguinis, 2017; Stam and van de Ven, 2021).

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THE BENEFITS OF CHATBOTS IN CUSTOMER SERVICE: A SYSTEMATIC LITERATURE REVIEW

Srikanth, Neha; Schlegel, Dennis

Faculty of Informatics, Reutlingen University, Reutlingen, Germany

Keywords: Chatbot Implementation, Customer Service, Benefits, Systematic Literature Review

Introduction

Chatbots have become widely used tools for automating customer service interactions, offering organisations a scalable way to manage rising customer expectations for fast, accessible support. Despite their widespread deployment, many organisations still lack clarity regarding the full range of benefits chatbots can offer. Existing studies tend to examine isolated outcomes of chatbot use, leaving the literature fragmented and without a consolidated overview of chatbot benefits in customer service.

Purpose, Aim and Objectives

This study aims to synthesise and structure the benefits associated with chatbot implementation in customer service through a systematic literature review (SLR). The objective is to identify the range of reported benefits across existing academic and grey literature and to organise these into a coherent framework that can inform both future research and organisational decision-making.

Literature Review

Prior studies have examined individual chatbot outcomes, such as brand loyalty and conversion rates (Ramki et al., 2024) or user satisfaction and loyalty (Hsu and Lin, 2023), but few have attempted a structured synthesis across the full range of reported benefits. Nicolescu and Tudorache (2022) provide a systematic review of chatbot-related human-computer interaction, though with a narrower focus on user experience rather than organisational value more broadly. This gap motivates the present review's broader, benefit-focused synthesis.

Methodology and Methods

Following established SLR guidelines, academic and selected grey literature were identified using Web of Science and Google Scholar. After screening for relevance and removing duplicates, 17 articles were retained for full analysis. Data were analysed using qualitative content analysis (Mayring, 2015), following an inductive category development process to identify benefit-related themes, which were then consolidated into a concept matrix mapping benefits against the reviewed studies.

Findings and Contribution

The review identifies 17 distinct benefits, grouped into four aggregate dimensions: Customer Experience and Satisfaction, Operational Efficiency and Cost Savings, Data-driven Insights and Trust, and Business Growth. Findings show that chatbots create value not only through efficiency gains and cost reduction, but also by enabling personalised interactions, supporting data-driven decision-making, and contributing to business growth through improved lead qualification and multilingual reach. The four dimensions appear to be mutually reinforcing rather than independent, with benefits such as data collection functioning as an enabling capability across multiple dimensions.

Originality and Value

This study contributes a structured, evidence-based framework consolidating previously fragmented findings on chatbot benefits in customer service. Unlike prior work examining isolated outcomes, this review offers a broader conceptual lens applicable across industries, providing a foundation for future empirical research and a practical reference for organisations setting realistic expectations around chatbot adoption.

Research Limitations

This review offers limited quantitative evidence to support several reported benefits, as most reviewed studies present qualitative findings. The inclusion of grey literature helped capture practice-oriented insights but introduced variation in methodological rigour. The search was not restricted by industry, which limited depth within any single sector.

Theoretical and Practical Applications and Implications

Theoretically, this review consolidates fragmented findings into a four-dimensional framework that future studies can test or extend across sectors. Practically, the concept matrix

serves as a reference tool, helping organisations identify which benefits are most relevant to their context and prioritise chatbot investment accordingly.

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FROM ALGORITHMS TO JUDGEMENT: ARTIFICIAL INTELLIGENCE AND STRATEGIC DECISION-MAKING IN MANAGEMENT

Melillos, George[1]**; Tsikkou, Emily**[1]**; Thanasoula, Panagiota**[1]

[1]College of Business Studies Cyprus (CBS), Nicosia, Cyprus

Keywords: Artificial Intelligence, Managerial Judgement, Strategic Decision-Making, Automation Bias, Sensemaking, Accountability, Human-AI Interaction, Conceptual Framework.

Introduction

Artificial intelligence (AI) is reshaping strategic decision-making, with forecasting models, recommendation engines, and dashboards now central to managerial practice (Vrontis et al., 2022; Csaszar et al., 2024). Existing research emphasises performance benefits but overlooks a deeper shift: AI changes not only what decisions are made, but how managers think and bear responsibility. Prior work examined structural change in AI-mediated decision-making (Shrestha et al., 2019); this study addresses the intra-cognitive mechanisms it leaves underspecified.

Purpose, Aim and Objectives

This study theorises how AI reconfigures managerial judgement in strategic decision-making. Three research questions are addressed. RQ1: How does AI reconfigure information sourcing in managerial judgement? RQ2: How does AI restructure accountability for strategic decisions? RQ3: Under what conditions does AI deployment intensify cognitive risk in high-stakes decisions? The aim is a conceptual framework yielding falsifiable propositions for empirical testing.

Literature Review and Theoretical Framework

Four frameworks are integrated, each with a distinct role. Dual-process theory supplies the cognitive architecture, separating fast System 1 from deliberate System 2 reasoning (Kahneman, 2011). Automation bias specifies its failure mode: under pressure, individuals over-rely on algorithmic outputs (Parasuraman and Manzey, 2010); the two are nested, the second locating where the first breaks down. Sensemaking adds the interpretive demand, as managers must evaluate an AI interpretation, not raw data (Weick, 1995). Accountability

theory supplies the governance constraint: decision-makers must justify choices to relevant audiences (Bovens, 2007), yet algorithmic opacity undermines this capacity. The integration moves beyond the automation-augmentation binary dominating current debate (Raisch and Krakowski, 2021). Individually, each framework explains one facet, cognition, error, interpretation, or accountability, but none captures their simultaneous reconfiguration by AI, the gap addressed.

Methodology and Methods

A conceptual, theory-building design is adopted using integrative literature synthesis (Jaakkola, 2020). Frameworks were selected for explanatory relevance to the cognitive, interpretive, or governance dimensions of AI-mediated decision-making, then integrated through scoping, selection, cross-framework integration, and proposition derivation. Macro-structural frameworks were excluded, as they do not address the intra-cognitive mechanisms central here.

Main Findings and Contribution

The study advances a reconfiguration thesis: AI neither replaces nor augments judgement but restructures the conditions under which it operates, across three causally linked dimensions (RQ1 to RQ3). Information sourcing shifts from interpreting organisational data toward evaluating algorithmic outputs (P1). Accountability becomes structurally diffused as decision rationale migrates into opaque model logic, creating a governance gap that individual diligence cannot resolve (P2). Automation bias is most severe under the time pressure, overload, and uncertainty of high-stakes decisions (P3), misaligning AI deployment with the conditions needing the greatest oversight. The first dimension conditions the second and third, and the third amplifies the second.

Originality and Value

The distinctive contribution lies in treating dual-process theory and automation bias as nested accounts, yielding the non-obvious prediction (P3) that automation bias peaks when oversight is most needed, a claim neither substitution nor augmentation framings generate.

Research Limitations

The framework is conceptual and not empirically tested, and does not address sector, firm-size, regional, or team-level variation.

Theoretical and Practical Implications

Because accountability diffuses structurally (P2), organisations need mandatory decision logs, explainability standards, and override protocols. Because automation bias intensifies under pressure (P3), institutionalised System 2 checkpoints are needed, since voluntary vigilance is insufficient. Management education must treat critical evaluation, contextualisation, and ethical oversight of algorithmic outputs as core competencies. Future research should test the propositions through cognitive task analysis, vignettes, and governance audits.

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GENERATIVE ECONOMY AND EFFECTUATION PROCESSES: A CONCEPTUAL FRAMEWORK

Gianpaolo Basile[1], Mario Tani[2], Maria Palazzo[3], Marco Valerio Rossi[4]

[1] Department of Economics, Business and Statistics, Universitas Mercatorum, Rome, Italy

[2] Department of Economics, Management, Institutions, University of Naples Federico II, Italy

[3] Department of Social and Human Science, Universitas Mercatorum, Rome, Italy

[4] Department of Economics, Business and Statistics, Universitas Mercatorum, Rome, Italy

Keywords: Generative AI, Effectuation theory, Innovation ecosystems, Value co-creation, Generative economy

Introduction

The increasing relevance of AI in shaping firm–user relationships is transforming business behaviour, shifting from a "causation" to an "effectuation" approach.

Purpose, Aim and Objectives

In the current era, based on the growing generative economy and a turbulent society, the decision-making process is based on an abductive approach in which the decision maker has to find the problem and, in the absence of antecedent experiences, start, in a creative state, a trial-and-error process to create a conceptual frame on which to base the behaviours.

This trend is shaping decision-making and management approaches, prompting businesses to adopt "effectuative" behaviours, capitalise on their own resources and capabilities, and create relationships with various stakeholders to adapt knowledge to competitive challenges.

The study addresses the following research questions:

- *Are the growing complex user-company interactions shifting decision-making processes from causation to effectuation?*
- *Can GAI help amplify the ecosystem model, leading to a new business configuration?*

Literature Review

The effectuation approach is a more flexible, resource-driven approach in which goals emerge over time in response to available means and evolving knowledge exchange relationships (Racat et al., 2024). It is therefore often associated with high-uncertainty contexts in which outcomes are indeterminate, and adaptability is critical (Sarasvathy, 2001; Garbuio and Lin, 2021; Galkina and Jack, 2024; Joussen et al., 2025).

Methodology and Methods

The work adopts an integrative conceptual approach based on the analysis of literature on causation and effectuation approaches and on generative economy. This work's scientific focus is aimed at presenting a conceptual framework.

Findings and Contribution

The research proposes a conceptual framework in which the Intelligence (AI) has a role in the abductive state (Ranieri et al., 2023; D'Angelo et al., 2024; Davenport and Ronanki, 2018; Cherbib, 2024; Kanbach et al., 2024; Dogru et al., 2025).

Originality and Value

The generative economy trend and the social and economic turbulences are shaping the management approach from a traditional causation-based approach, grounded in the Porterian STP process, to an effectuation approach grounded in relevant reactive behaviours in response to continuous change.

Research Limitations

The work is in progress, and the state of the art is at a conceptual level, lacking a practical application.

Theoretical and Practical Applications/Implications

The paper's contribution is to show how AI is changing decision-making processes, reshaping firm boundaries and business models, focusing on reactive and effectual approaches, and shaping the current economic model into a generative economy.

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ETHICAL COLLABORATION OF GAI-HI FOR STRATEGIC MARKETING PLANNING

El-Wakil, Ahmed[1]; Kaufmann, Rüdiger [2]; Thrassou, Alkis [3]; Wagner, Ralf [4]

[1]Management Department, Business School, University of Nicosia, Nicosia, Cyprus
[2]Management Department, Business School, University of Nicosia, Nicosia, Cyprus
[3]Management Department, Business School, University of Nicosia, Nicosia, Cyprus
[4]School of Economics and Management, University of Kassel, Kassel, Germany

Keywords: GAI - HI Collaboration - Ethics - decision-making – problem-solving - Strategy - Marketing Planning

Abstract

In the manufacturing sector, effective strategic marketing planning is essential for sustaining strong relationships between manufacturers and their sales channels (Brooksbank et al., 2018). Within this context, strategic marketing problem-solving can be seen as playing a central role in managing these relationships (Svensson et al., 2023).

The literature review explores the evolving landscape of strategic marketing problem-solving and decision-making, emphasizing that problem-solving is the more relevant for addressing complex challenges. Therefore, professionals must make numerous timely decisions, often by breaking the problem into smaller decisions (Yurtseven et al., 2021). Accordingly, a Conceptual Strategic Problem-Solving Path (CSPSP) is proposed, which decomposes complex strategic marketing planning problems into groups of Decision Units (DUs). Each DU represents a decision-making process aimed at solving a specific sub-problem statement. By addressing all DUs, the main problem statement is resolved.

As GAI increasingly contributes to decision-making while HI remains in the loop, the literature review examines the dynamics of GAI–HI collaboration in strategic marketing (Huang, M. & Rust, 2021). However, the use of AI in decision-making presents ethical challenges (Çerçi, 2024; Islam et al., 2024; Su et al., 2023). Accordingly, this study aims to examine how collaboration between GAI and HI can improve strategic marketing planning decisions (Erlei et al., 2024; Huang, M. & Rust, 2022; Raisch & Fomina, 2023) while carefully addressing the ethical implications of this collaboration (Huang, Y. et al., 2025; Islam et al., 2024; Su et al., 2023).

Therefore, the research questions of this study are:

1- What is the effective collaboration pattern between GAI-HI for achieving successful decision-making in strategic marketing?

2- What are the ethical dimensions and considerations of both GAI and HI in strategic marketing decision-making, and how they interact in practical application?

As pioneers in this field, Huang & Rust (2022) proposed an AI–HI collaboration framework in marketing with three intelligence levels: Mechanical, Thinking, and Feeling. AI is stronger in routine and analytical tasks, while humans excel in contextual, intuitive, and emotional work. Rather than replacing humans, AI should augment and complement human performance.

While their work provides a good foundation, their framework is largely conceptual and offers limited practical and ethical guidance. It was also developed before the rise of GAI.

To address these gaps, this research extends the framework proposed by Huang & Rust into the *Conceptual Ethical Collaboration Framework* (CECF) by incorporating complementary ethical dimensions and themes from the literature.

While the CECF is still under development, it is designed to integrate five ethical dimensions across both GAI (rule-based, outcome-based) and HI (adaptive, moral, affective), while extending its scope to complex strategic decision-making.

As this research focuses on strategic problem-solving in marketing, ten ethical themes were derived from six key frameworks identified in the relevant literature. They explain how GAI–HI collaboration can be managed ethically which are: Accountability, Transparency, Fairness and Non-bias, Human Autonomy and Empowerment, Ethical Governance and Responsibility, Cultural and Societal Ethics, Collaboration and Co-creation, Creativity and Integration, Consumer Protection, Consent, Privacy and Trust, and Sustainability and Long-term Impact (Choudhary, 2025; Hari et al., 2025; Hermann & Puntoni, 2025; Heyder et al., 2023; Kirkby et al., 2025; Madanchian & Taherdoost, 2025). These ten ethical themes are subsequently integrated into the five ethical dimensions of the CECF.

The CECF seeks to bridge the gap between theory and practice (Zhou & Chen, 2023). It integrates ethical considerations into practical marketing decision-making processes, ensuring that collaboration remains ethically grounded. To support practical application, the CECF will be applied to the DUs of the CSPSP proposed earlier.

To empirically examine the CECF, a qualitative case study research method will be applied in a manufacturing context from an interpretivist epistemological stance, making it a domain

specific. This approach is particularly effective for exploring complex phenomena that cannot be fully understood through other research methods (Kuckartz, 2014).

The study employs purposive sampling and semi-structured interviews with 10 experts each in strategic marketing, AI development, and AI ethics, all with professional expertise. The interview guide will be pre-tested, and snowball sampling will be used to recruit additional participants. (Naderifar et al., 2017).

The interview transcripts will be coded and organized into themes. Subsequently, a thematic analysis, supported by MAXQDA software (Kuckartz & Rädiker, 2019), will be conducted to identify diverse perspectives on collaboration patterns, recurring ethical tensions, and the role of human oversight.

The study aims to identify GAI–HI collaboration patterns, key ethical issues, and the role of human oversight in marketing decisions. It will develop a framework linking collaboration with ethics, supporting better marketing strategies and future research.

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DOES INFORMATION SHARING HELP OR HURT COLLECTIVE INNOVATION IN AI-BASED ECOSYSTEMS?

Labonia, Umberto[1]; Bargoni, Augusto[1,2]; Bresciani, Stefano[1,3]

[1]Department of Management "Valter Cantino", University of Turin, Turin, Italy
[2]Faculty of Informatics and Statistics, Prague University of Economics and Business, Prague, Czech Republic
[3]Gnosis - Mediterranean Institute for Management Science, School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: AI-based ecosystems, collective innovation, information sharing, procedural justice, knowledge withholding, learning investment

Introduction

AI-based innovation ecosystems depend on interdependent actors who combine data, technical expertise and domain knowledge across organisational boundaries. To coordinate these contributions, ecosystem orchestrators often formalise information sharing requirements. Yet mandatory sharing is ambivalent: it can improve comparability and learning, but it can also heighten concerns about knowledge leakage and appropriation (Laursen and Salter, 2014; Secundo et al., 2025).

Purpose, Aim and Objectives

This study examines when information sharing requirements help or hurt collective innovation. It asks whether stricter requirements reduce collective innovation directly and indirectly through two opposing behavioural mechanisms: defensive knowledge withholding and learning investment. It also tests whether procedurally fair governance changes this balance.

Literature Review and Theoretical Framework

Collective innovation is defined as the joint generation, integration and refinement of novel ideas, prototypes or solutions by interdependent ecosystem actors. It is therefore bounded to ecosystem-level outcomes requiring cross-actor knowledge integration, rather than single-firm innovation

performance or generic collaboration quality (Dhanaraj and Parkhe, 2006; Adner, 2017). Stricter information sharing requirements should increase defensive knowledge withholding because actors may restrict or sanitise valuable inputs when visibility and transferability rise. This should damage collective innovation by reducing the completeness and recombinability of contributions. However, the same requirements may also stimulate learning investment by clarifying what knowledge is needed, how it should be exchanged and how actors can jointly develop solutions. Procedural justice, understood as transparent, consistent and correctable governance, should weaken the protection pathway and strengthen the learning pathway (Adamovic, 2023).

Accordingly, we hypothesise that stricter information sharing requirements reduce collective innovation (H1), increase defensive knowledge withholding (H2), and increase learning investment (H4); defensive withholding decreases collective innovation (H3), whereas learning investment increases it (H5); procedural justice weakens the requirement-withholding relationship (H6a) and strengthens the requirement-learning relationship (H6b).

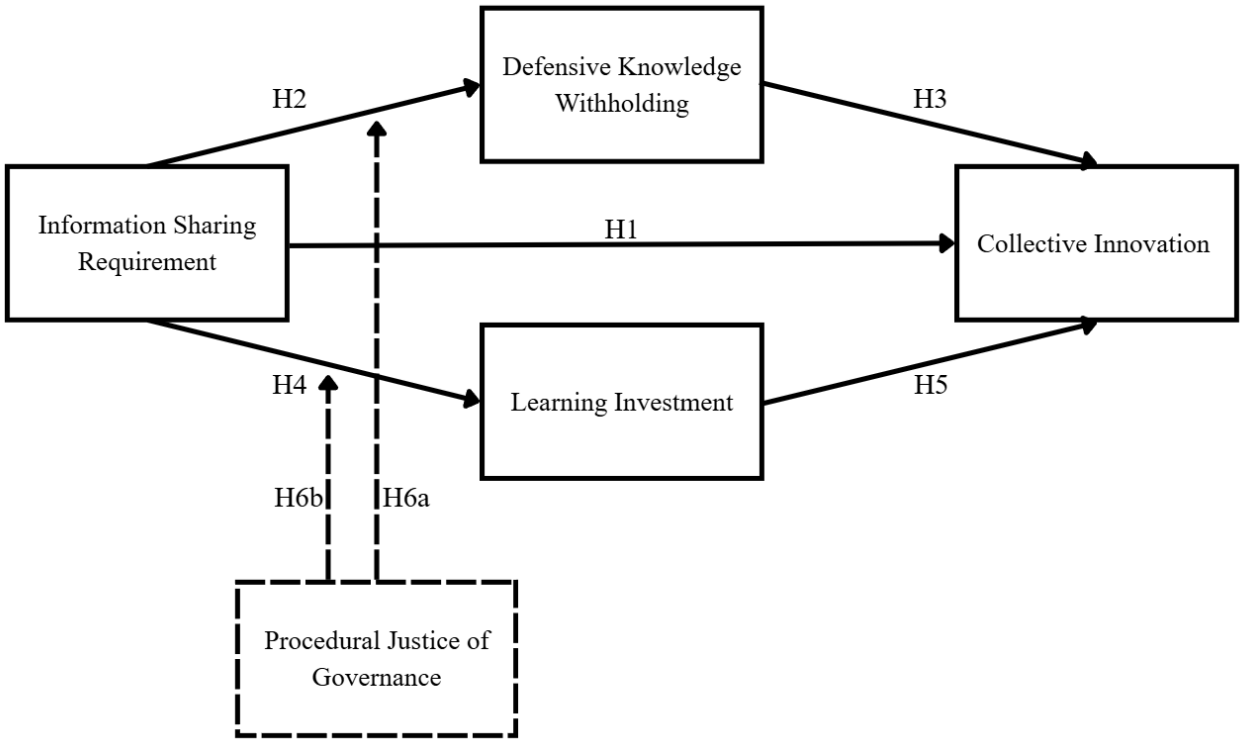


***Figure 1**: Conceptual framework*

Methodology

Data will be collected through an online 2×2 randomised vignette experiment. Information sharing requirements vary between low discretion and high scope and standardisation, while procedural

justice varies transparent criteria, consistent enforcement, and voice and correction opportunities. Collective innovation captures expected contribution to shared development through knowledge integration and co-creation. Hypotheses will be tested with factorial regression and bootstrapped conditional indirect effects.

Expected Findings and Contribution

We expect stricter requirements to reduce collective innovation when defensive withholding outweighs learning investment, especially under low procedural justice. Under high procedural justice, defensive withholding should decline and learning investment should dominate, producing a less negative or positive net effect. The study contributes by shifting attention from openness as a structural design choice to the behavioural consequences of mandatory sharing in AI-based ecosystems. It explains why the same governance requirement can generate opposite behavioural responses and identifies procedural justice as a boundary condition that rebalances protection and learning.

Originality and Value

The study specifies the micro-behavioural tension behind ecosystem openness: actors may comply with formal sharing while still protecting their most valuable knowledge. This distinction clarifies why information sharing mandates may fail even when they improve transparency.

Research Limitations

The study relies on scenario-based behavioural intentions rather than observed ecosystem behaviour. Its findings therefore require validation across real AI-based ecosystems and different appropriation regimes.

Theoretical and Practical Implications

For managers, the study indicates that more information sharing is not automatically beneficial. Orchestrators should pair demanding requirements with transparent rules, consistent enforcement, voice mechanisms and credible correction procedures, because these practices target defensive withholding while preserving the learning benefits of richer exchange.

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FROM THE BRIGHT TO THE DARK SIDE OF STRATEGIC LEADERSHIP IN AI MANAGEMENT: A MULTI-ECHELON PERSPECTIVE FROM SMES

Bevilacqua, Simone[1,2]; Baima, Gabriele[1]; Ferraris, Alberto[1,3]

[1] Department of Management "Valter Cantino", University of Turin, Turin, Italy

[2] Department of Management and Marketing, University of Innsbruck, Innsbruck, Austria

[3] Mediterranean Institute for Management Science, School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Strategic Leadership, Artificial Intelligence, Dark Side, Top Managers

Artificial intelligence (AI) has rapidly become a central driver of digital transformation in organizations, reshaping organizational processes and decision-making (Enholm et al., 2022). Unlike previous waves of digitalization, AI encompasses heterogeneous technologies such as generative AI, machine learning algorithms, robotics, and augmented reality that introduce autonomous, adaptive, and learning-based capabilities directly influencing how decisions are generated, evaluated, and executed, and overall performance (Bevilacqua et al., 2026; Mikalef & Gupta, 2021).

As AI increasingly permeates strategic decision processes, its implementation becomes not merely a technological issue but a leadership challenge (Enholm et al., 2022). Within the strategic leadership literature, scholars underscore the pivotal role of top managers in shaping AI adoption, portraying AI as a strategic enabler that enhances decision-making and creates new managerial roles and skills (Bevilacqua et al., 2025, 2026; Jorzik et al., 2023). However, this literature remains predominantly focused on the positive implications of AI for leadership, underexploring the potential dark side of strategic leadership in AI-enabled contexts.

A parallel stream of research has increasingly drawn attention to the unintended consequences of AI use, highlighting risks such as bias amplification, opacity, accountability gaps, and reduced human agency (Mikalef et al., 2022). More recently, leadership research has suggested that managing human–AI collaborations may induce moral relativism among leaders, increasing the likelihood of unethical behaviour (He et al., 2025). Taken together, these insights suggest a critical theoretical gap. While prior research has extensively examined how AI enhances strategic leadership, we still lack clarity on which negative leadership practices may

emerge from AI management and their consequences for employees across organizational levels.

Grounded in a multi-echelon strategic leadership perspective that considers both leaders' and followers' dynamics, this study investigates the potential dark side of strategic leadership in AI management. Accordingly, we address the following research question: What negative leadership practices emerge in the management of AI use, and what are their consequences for employees?

To address this question, we conducted a qualitative study of Italian SMEs that have adopted AI technologies. Our data include semi-structured interviews with top managers, middle managers, and/or employees, complemented by focus groups and internal documents, analyzed using the Gioia methodology.

Preliminary findings reveal three recurring negative leadership practices in AI management. First, we identify AI micromanagement, whereby leaders intensify algorithmic monitoring and control, generating social stress and reducing employee autonomy and creativity. Second, we observe AI washing, characterized by the symbolic adoption of AI without clear strategic alignment, process redesign, or upskilling investments, leading to employee disengagement, loss of direction, and resistance to technology. Third, we uncover AI productivity intensification, in which leaders implicitly raise output expectations enabled by AI tools without redefining workload boundaries or sustainability norms, resulting in expanded task scope, accelerated work rhythms, and increased cognitive strain, while heightening the risk of opportunistic and ethically questionable behavior.

This study contributes to strategic leadership research by showing, beyond the optimistic perspective, the dark side of leadership in the management of AI inside organizations. Adopting a multi-echelon perspective, it considers followers' experiences and the consequences of negative AI leadership practices. Finally, for managers, the findings highlight the need for governance mechanisms that preserve discretion, autonomy, and ethical responsibility.

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LEARNING TO SCALE: WHAT MENTORING REALLY DOES FOR STARTUPS

Macca, Luca Simone[1]; Daou, Alain[1,2]

[1] Faculty of Business, American University of Beirut – Mediterraneo, Paphos, Cyprus

[2] Olayan School of Business, American University of Beirut, Lebanon

Keywords: *Entrepreneurship, Mentoring, Entrepreneurial ecosystem, Scalability, Startups, Business models, Innovation*

Abstract

In contemporary entrepreneurial ecosystems, early-stage ventures are increasingly exposed to strong pressures to demonstrate scalability, legitimacy, and investment readiness at very early stages of development (Stein et al., 2026; Spigel, 2017; Troise et al., 2022). Mentorship programs have emerged as a central mechanism through which startups are guided in navigating these pressures, particularly in accelerator- and university-affiliated settings (Eesley and Lee, 2021; Lall et al., 2023). Prior research positions mentoring as a key mechanism through which early-stage founders gain access to experiential knowledge, strategic feedback, and social capital, thereby helping them cope with uncertainty and resource constraints (Yusubova and Knoben, 2025; Wu and Tsao, 2025). Empirical studies consistently show that founders value mentoring highly and often cite it as a primary reason for participating in structured support programs (Kirsch et al., 2025; Yusubova and Knoben, 2025).

The dominant stream of mentoring research adopts an outcome-oriented perspective. Quantitative, experimental, and survey-based studies link mentoring to outcomes such as entrepreneurial self-efficacy, opportunity recognition, strategic goal attainment, and major strategic decisions including pivoting (Kirsch et al., 2025; Pereyra et al., 2021; St-Jean and Tremblay, 2020). Recent work further demonstrates that the framing of mentor feedback matters, showing that concrete feedback increases the likelihood that entrepreneurs act on advice compared to more abstract guidance (Welbourne and Miller, 2026). While these studies establish that mentoring can influence entrepreneurial behaviour, their findings are often context-dependent, and similar mentoring interventions frequently produce heterogeneous outcomes across ventures.

To address these limitations, a growing body of research conceptualises mentoring as a relational and cognitive process embedded in ongoing interaction. For example, drawing on socially situated cognition and sensemaking perspectives, Kaffka et al. (2021) highlight how feedback from mentors and other stakeholders can disrupt entrepreneurs' existing assumptions and trigger new sensemaking through reframing, questioning, and reinterpretation. Process-oriented studies of entrepreneurial learning similarly show that entrepreneurs dynamically shift between exploratory and exploitative learning strategies in response to uncertainty and feedback, with learning trajectories shaped by situational conditions and interactional contexts (El-Awad, 2023; McKevitt and Marshall, 2015). A similar stream of research on sustainability-driven enterprises further demonstrates that entrepreneurs engage in different patterns of sensemaking depending on the ambiguity and urgency of the issues they face (Zeng et al., 2026).

Despite these advances, mentoring interactions themselves remain underexplored. Most studies rely on retrospective accounts, experiments, or surveys, rather than examining mentoring interactions as they unfold over time. This aspect follows an evident need to investigate and learn more about how the mentor-mentee relationship transforms in scalability and business model transformation. While research on scaling, pivoting, and platform growth identifies key drivers of venture growth and strategic reorientation (Granot et al., 2026; Macca et al., 2025; Nagy et al., 2025), it largely focuses on outcomes rather than on how founders learn to think in scalable terms. This lack of knowledge is especially evident for early-stage ventures, where scalability requires cognitive, strategic, and identity transformations (Liu et al., 2026; Somaya and You, 2024). In this regard, the literature points to a need for longitudinal, interaction-level research that examines how mentoring shapes founders' sensemaking and scalability thinking over time.

Building on the above literature, this study examines mentoring as an evaluative and sensegiving process that structures how scalability is defined, assessed, and enacted in early-stage ventures. Building on qualitative evidence from a longitudinal mentorship program involving five startups operating across diverse sectors (e.g., digital platforms, marketplaces, creative industries, and knowledge-intensive services), this research investigates how mentoring interactions reshape founders' interpretations of venture progress and legitimacy. Each startup was supported through multiple semi-structured mentoring sessions over time, generating a rich dataset of recorded and transcribed interactions that captures both mentor interventions and founder responses as they unfolded. Data collection was also supported by documentary and observational evidence (e.g., mentoring policy statements, guidelines and

procedures, company websites and business plans), which were useful in validating the startup's development phase and identifying milestones.

Our preliminary findings show that: (1) mentoring consistently installed what we conceptualise as a scalability evaluative regime. Through repeated interactions, mentors introduced external evaluative criteria aligned with investor, partner, and market expectations, thereby shifting attention away from internally meaningful indicators such as effort, creativity, or early traction; (2) founders did not respond uniformly to this evaluative regime: instead, they engaged in active sensemaking and boundary work as they interpreted and translated mentoring input into action; (3) over successive interactions, these sensemaking responses stabilised into three distinct emergent scalability trajectories (i.e., relabeling trajectory, systematising trajectory, narrativising trajectory), which illustrate that scalability is not a singular outcome but an emergent process shaped by how evaluative criteria are enacted in practice.

The contribution of this study is threefold. First, it advances entrepreneurial mentoring research by conceptualising mentoring not only as relational support or knowledge transfer, but as an evaluative sensegiving process that actively structures how ventures are assessed and understood. Second, it contributes to the entrepreneurship and scalability literature by showing that scalability emerges through multiple trajectories rather than converging on a single dominant model. Third, it offers practical implications for the design of mentorship and accelerator programs by highlighting the unintended consequences of evaluative regimes and the importance of recognising founder sensemaking dynamics.

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DOES PUBLIC FUNDING DRIVE SME INNOVATION? RETHINKING INNOVATION SUPPORT FOR SMES.

Peiro-Signes, Ángel[1]; Segarra-Oña, Marival[1]; García-Meseguer, Carlos[1]; Sempere-Ripoll, Francisca[1]

[1]Management Department, Universitat Politècnica de València, Valencia, Spain

Keywords: SME innovation, Public funding**,** Non-R&D innovation**,** Innovation pathways

Introduction

European innovation policy has long emphasized public funding and R&D expenditure as key instruments for fostering innovation, particularly among small and medium-sized enterprises (SMEs). However, increasing evidence shows that SME innovation rarely depends on R&D alone. Firms instead combine internal R&D, non-R&D innovation activities, technology adoption, cooperation, and strategic orientation in diverse ways. This raises a critical question: when these drivers are considered jointly, does public funding act as a decisive catalyst for SME innovation, or does it mainly reinforce innovation efforts already underway? Addressing this issue is essential for designing innovation policies aligned with the actual innovation behavior of SMEs.

Aim of the Study

The purpose of this study is to reassess the role of public funding in SME innovation within a broader configuration of innovation drivers. The main aim is to identify combinations of firm-level characteristics that distinguish innovators from non-innovators and to assess the relative contribution of public funding within these configurations.

Theoretical Framework

The study builds on literature highlighting the limitations of linear innovation models and the heterogeneity of SME innovation processes. The Science Technology Innovation (STI) and Doing Using Interacting (DUI) frameworks emphasize that firms may innovate through formal R&D or through practice-based learning, technology adoption, and interaction with external actors (Jensen et al., 2007; Asheim and Coenen, 2006). Empirical research on public funding reports mixed

effects, often contingent on firm characteristics and innovation type (Bronzini and Piselli, 2016). Recent studies therefore call for approaches that capture complementarities and non-linear interactions among innovation drivers (Hervás-Oliver et al., 2021). This study adopts a configurational perspective consistent with these insights.

Methodology

The empirical analysis uses firm-level data from the Spanish sample of the 2018 Community Innovation Survey, covering 26,270 SMEs. Firms are classified as innovators or non-innovators based on the introduction of product and/or process innovations. A supervised machine-learning classification approach is employed, using Extreme Gradient Boosting (XGBoost) to model non-linear relationships and interactions. Feature selection is conducted using the Boruta algorithm, while model interpretability is enhanced through SHapley Additive exPlanations (SHAP) and a surrogate decision tree identifying recurrent configurations associated with innovation or non-innovation.

Main Findings and Contribution

The results show that SME innovation is multi-path. Several distinct combinations of drivers are sufficient to generate innovation outcomes. Non-R&D innovation expenditure, sustained in-house R&D with a strategic focus on new products, adoption of new machinery and software, and cooperation emerge as the most influential drivers. Their joint absence almost always leads to non-innovation. Public funding for R&D shows a positive but comparatively modest influence: its effect strengthens when combined with other drivers but it does not function as a standalone determinant of innovation. These findings challenge policy approaches focused narrowly on expanding funding volumes or R&D inputs.

Originality and Value

The study shifts the analytical focus from average funding effects to the configurations that characterize innovative SMEs. By applying interpretable machine-learning techniques to large-scale microdata, it uncovers heterogeneous innovation pathways that remain hidden in conventional linear models and provides a more realistic understanding of the conditional role of public funding.

Research Limitations

The analysis relies on cross-sectional, self-reported survey data, which may involve recall bias and limits causal inference. The absence of detailed information on funding amounts, timing, and duration constrains the assessment of intensity and lagged effects. The focus on Spanish SMEs also limits generalizability to other institutional contexts.

Theoretical and Practical Implications

Theoretically, the findings support configurational and systemic views of innovation, reinforcing the relevance of the STI and DUI frameworks. Practically, they suggest that innovation policy should link funding more closely to concrete innovation activities—such as non-R&D projects, technology adoption, and cooperation—rather than treating funding as an end in itself.

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THE AI CO-FOUNDER: A TYPOLOGY OF STUDENT-AI INTERACTIONS IN THE ENTREPRENEURIAL "FUZZY FRONT END"

Gil-Or, Oren[1]

[1]School of Management & Economics, The Academic College of Tel Aviv-Yaffo, Tel Aviv-Yaffo, Israel

Keywords: Entrepreneurship Education, Generative AI, Ideation, Human-AI Collaboration, Opportunity Recognition, Prompt Engineering, Co-creativity.

Introduction

The "fuzzy front end" of entrepreneurship—the chaotic initial stage of opportunity identification—is traditionally a cognitive bottleneck for novice entrepreneurs. The integration of Generative AI (GenAI) agents into this process promises to alleviate cognitive friction. However, while the technical capabilities of Large Language Models (LLMs) are well-documented, the nature of the *dialogue* between nascent entrepreneurs and AI remains underexplored. Does the AI act as a mentor, a tool, or a crutch? This study analyzes naturalistic conversation logs to categorize emerging patterns of student-AI interaction.

Purpose, Aim and Objectives

The primary aim is to empirically classify how MBA students utilize GenAI during venture ideation. The objectives are: (1) to identify distinct typologies of user interaction; (2) to assess the correlation between interaction style and business model viability; and (3) to determine if AI fosters critical thinking or cognitive offloading.

Literature Review and Theoretical Framework

The study is grounded in the theory of Human-Computer Co-Creativity, which posits that creative output is a function of the collaborative friction between human intent and machine generation (Dell'Acqua et al., 2023). Previous literature on entrepreneurship education emphasizes "divergent thinking" as a core skill (Girotra et al., 2023). However, recent studies

suggest a risk of "cognitive offloading," where users uncritically accept AI outputs (Mollick and Mollick, 2023). This research addresses the gap regarding conversational mechanics, specifically, how students negotiate validity and feasibility with an AI agent prone to "hallucinations", by questioning whether students treat the AI merely as a passive search engine or engage it as an active co-founder.

Methodology and Methods

The study employs a qualitative, inductive research design. The dataset consists of 40 complete conversation logs between MBA students and a custom "Ideation AI" bot, collected during a graduate-level entrepreneurship course. The data was subjected to thematic content analysis to map prompt strategies, iteration frequency, and decision-making patterns. The unit of analysis was the full conversation thread, tracing the evolution of the concept from initial prompt to finalized Business Model Canvas.

Main Findings and Contribution

The analysis reveals three distinct typologies of Student-AI interaction, forming a U-shaped utility curve:

- ***The outsourcer (Low agency - 15%):*** Students utilized AI to bypass cognitive effort (e.g., *"Find me a venture that earns 2 million"*). These interactions produced generic, "hallucinated" opportunities with low market viability. The students accepted high-level abstractions as actionable plans.
- ***The validator (Medium agency - 55%):*** The majority used AI to confirm pre-existing biases. The AI served as a "feasibility check", refining financial assumptions but rarely altering the core value proposition.
- ***The commander (High agency - 30%):*** This cohort engaged in "adversarial collaboration." These users, often with domain expertise, explicitly corrected the AI's technical assumptions. Some employed advanced prompt engineering (e.g., defining <ROLE> and <TASK> tags) to force specific outputs. These interactions produced the most distinct and viable business models.

Crucially, the U-shaped utility suggests that without human agency, AI democratization risks widening the competence gap between 'Commanders' and passive users.

Originality and Value

This research offers one of the first empirical taxonomies of *actual* student-AI dialogues, moving beyond self-reported surveys. It contributes to the field by demonstrating that "Prompt Engineering" is a proxy for entrepreneurial agency.

Research Limitations

The study is limited to a single cohort in the Israeli ecosystem. Future research should examine cross-cultural differences in AI adoption.

Theoretical and Practical Implications

Theoretically, this refines the *Opportunity Recognition* model by inserting "Algorithmic Iteration" as a critical stage. Practically, it highlights the need for curricula teaching "Conversational Competence", critically leading AI rather than passively following. Developing 'Conversational Competence' empowers students to strategically direct AI, preventing uncritical cognitive offloading. Curricula must therefore prioritize 'prompt leadership', teaching students to manage AI as a critical co-founder rather than an oracle.

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PROMOTING SUSTAINABILITY IN PERIPHERAL REGIONS: A REGIONAL ECONOMIC DEVELOPMENT (RED) MODEL

Raphael Bar-El 1,2, David Bentolila 3 and Liran Maymoni 4

1 Public Policy & Administration Department, Ben Gurion University of the Negev, Israel

2 Department of Applied Economics and Administration, Sapir Academic College, Israel

3 Ruppin Academic Center, Israel

4 Sapir Academic College, Israel

Keywords: Sustainability, Peripherality, Regional Development, Spillovers, Income Leakages.

Abstract

The growing concentration of innovation-driven economic activity in core metropolitan areas threatens the sustainable development of peripheral regions. Conventional aid programs are giving way to place-based strategies that harness endogenous regional resources. Yet most computable general-equilibrium (CGE) models, the standard tools for policy appraisal, operate at the national scale and generally treat regions as passive recipients. This study adopts the regional system (RS) approach and contributes a step towards its practical implementation with the introduction of a Regional Economic Development (RED) model, a CGE framework that embeds the region as an explicit behavioral block inside a national system. The model comprises four interlinked modules and makes a key distinction, often overlooked in the RS literature, between a region's domestic product (output generated within the territory) and its regional product (income earned by resident labor and capital, irrespective of where those factors are employed). This distinction captures income leakages and interregional spill-overs, factors that are critical for peripheral economies. Scenario analysis couples exogenous policy levers, tax incentives, infrastructure upgrades, human-capital investment, with endogenous outcomes such asemployment, income, and structural change. By disentangling internal production capacity from external income opportunities, the RED model lets policymakers compare strategies that prioritize local output with those that maximize household welfare. Iterative simulations reveal feasible development targets, the policy mixes required to achieve them, and the structural implications of each trajectory.

CORPORATE VENTURE CAPITAL PERFORMANCES IN INNOVATION ECOSYSTEMS – EVIDENCE FROM STARTUPS

Rossi, Matteo[1]; László Koloszár[2]; Festa, Giuseppe[3]

[1] Department of Law Economics Management and Quantitative Methods, University of Sannio, Benevento, Italy, and Wyzsza Szkoła Bankowa w Poznaniu – WSB University, Poznan, Poland
[2] Faculty of Economics, University of Sopron, Sopron, Hungary
[3] School of Economics and Law, Department of Management and Economics, Pegaso Telematic University, Naples, Italy

Keywords

Corporate venture capital; Venture capital; Knowledge Based View; Innovation ecosystems framework; Venture capital networks; Entrepreneurial finance; Innovation management; Ecosystem management.

Abstract

Corporate Venture Capital (CVC) initiatives may foster entrepreneurial outcomes adopting a strategic perspective that focuses on relational-embedded ecosystems and not only on the outputs of discrete transactions. Grounded in the Knowledge-Based View and in the Innovation Ecosystems framework, this research aims to examine how CVC operational intensity and network embeddedness may shape startup (SU) funding and innovation. Analyzing a large-scale panel constructed from Crunchbase and USPTO PatentsView data, the investigation results show that startups assisted by CVC with high operational intensity and high network embeddedness exhibit enhanced entry to further funds and superior innovation performance. In addition, a moderating role of technological intensity seems to exist, meaning that CVC engagement may probably rely more on the ecosystem positioning than on the technological context. Envisioning CVC as an embedded, learning-oriented dynamics, this research aims to provide novel empirical evidence on the mechanisms of value creation management in

entrepreneurial finance, highlighting the relational impact of corporate investors within broader innovation networks.

Introduction

Corporate Venture Capital (CVC) is a form of entrepreneurial finance that has constantly intensified innovative responding to environmental demands, emerging technologies, and increasing situational uncertainties (Xiao et al., 2025). In this vein, innovation emerges as the outcome of multiple interconnected relationships among disruptive companies (and mainly startups), investors, large corporations, and institutions, each characterized by continuous change (Jha and Basu, 2025).

This study aims to understand some nuances of the transforming dynamics of CVC from the perspective of the innovation ecosystems, focusing on the emerging integration of open innovation, knowledge management, and intellectual capital into the ecosystem value creation (Bugl et al., 2022). More specifically, adopting the theoretical approach of the Knowledge-Based View (Pereira and Bamel, 2021) in combination with the Innovation Ecosystems framework (Toth and Hary, 2024), CVC is assumed as an entrepreneurial activity with multiple dimensions, with particular focus, within this setting, on operational intensity and networked embeddedness.

Background and Hypotheses

Iin terms of entrepreneurial finance management, CVC means and implies much more than the mere finding of innovation outside the organization (Rossi et al., 2022). In truth, CVC is also and perhaps most of all a way for big players to prepare for uncertainty regarding innovation, exploring and exploiting new business trajectories without the large and permanent cost of working on new applications internally or purchasing competing companies (Ryu et al., 2025). Several studies have further elaborated this perspective focusing on the distinction between strategic and financial CVC activities: strategic CVC is designed for gaining advantages in terms of knowledge spillover, identifying and creating new complementary technologies (Bugl and Kanbach, 2022), while financial CVC is designed for portfolio firm gains (Szalavetz and Sauvage, 2024). In truth, CVC has consistently shown some orientation toward creating hybrid value or value adjacency (Kronberger et al., 2025).

In this respect, Venture Capital (VC) environments are interconnected through factors that may influence investment decisions, like syndication patterns, reputational assets, and recurring interactions among diverse investors (Danneels and Miller, 2023). In this regard, the Knowledge-Based View and the Innovation Ecosystem framework appear as essential development perspectives when considering investments that are operated with the intention to go beyond the first round and approaching a broader entrepreneurial system vision with a broader performance system evaluation. More specifically, the following research hypotheses have been conceived with specific focus on startups, due to their peculiar nature of entrepreneurial ventures starving for financial funds, professional competences, and business relations (Errico et al., 2024).

First, when CVC operational intensity is intended more in terms of experience, learning, and competence (rather than just strict control of the backed startup), the advantages of better knowledge management are likely to succeed (Rossi et al., 2022). Thus, it is assumable that higher levels of operational intensity in CVC initiatives on startups could lead to better entrepreneurial results of the backed startups (Seitz et al., 2026).

Hypothesis 1 (H1): There is a positive association between the CVC operational intensity and the entrepreneurial performance of CVC-backed startups.

Second, a strong network embeddedness can bring some risks, because 'central' players often face more coordination tasks, which can lead to information overload: in addition, being central might heighten conflicts of interest or distract from the needs of individual portfolio companies (Anokhin et al., 2011). More in general, however, even with these potential downsides, the advantages of being embedded in an ecosystem likely outweigh the potential associated costs, especially when paired with relevant CVC involvement (Haslanger et al., 2023).

Hypothesis 2 (H2): There is a positive association between the CVC ecosystem embeddedness and the entrepreneurial performance of CVC-backed startups.

Third, and finally, technological intensity seems to play an ambiguous role, potentially moderating interactions in enhancing some value creation mechanisms while lowering others (Xie and Wang, 2025). Thus, it is assumable that the conditions of the technological environment might influence how the CVC engagement affects the entrepreneurial outcomes (Sharan et al., 2023).

Hypothesis 3 (H3): The positive association between the CVC engagement and the entrepreneurial outcomes of CVC-backed startups depends on the technological intensity of the environment.

Methods

As regards the variables, to measure the CVC outcomes in startup investments, data has been extracted from the Crunchbase open datasets, which provide relating information about startups, investors, funding rounds, and their institutional relationships (Crunchbase.com). To measure the innovation outcomes, data has been extracted from the United States Patent and Trademark Office (USPTO) PatentsView database (Patentsview.org), which provides details on patent applications, assignees, and tech classifications. Additionally, further data from the World Bank (Worldbank.org) and the OECD – Organization for Economic Cooperation and Development (Oecd.org) archives has been investigated to provide more contextual information regarding the economic and technological conditions at the country level.

As regards the sample, the perimeter under investigation has included, starting from the abovementioned databases, 5,420 startups and 845 CVC firms from around the globe. Table 1 provides an overview of all the variables that have been used in the analysis, together with their measurements (as per underlying theoretical foundations and/or similar studies in the field).

Variable	Level	Measurement
Innovation performance	Startup–year	Number of patent applications (IPC – Intellectual Property Committee scope)
Follow-on funding	Startup–year	Dummy = 1 if a new funding round occurs
Post-investment capital	Startup–year	Logarithm of the raised capital
Operational intensity	Investor	Cumulative number of prior CVC investments
Ecosystem embeddedness	Investor–year	Degree and betweenness centrality
Technological intensity	Industry	Patent intensity, R&D expenditure
Control variables	Multiple	Age, prior funding, industry, country, year

Table 1: Variables' overview (authors' elaboration).

As regards the investigation methods, a blended approach including descriptive statistics and inferential statistics (namely, logistic regressions and linear regressions) has been adopted.

Results

About H1 and H2. As shown in Table 2, the correlations indicate that both operational intensity and ecosystem embeddedness have a positive relationship with the innovation outcomes and the funding outcomes of CVC-backed startups, although with some weakness. These insights pave the way for further multivariate analysis that may explore the combined effects of CVC operational intensity and ecosystem embeddedness.

Variable	Mean	SD	1	2	3	4
1 SU Patents	2.140	4.870	1,000	-	-	-
2 SU Follow-on funding	0.410	0.490	0.320	1,000	-	-
3 CVC Operational intensity	18.600	27.400	0.280	0.210	1,000	-
4 CVC Ecosystem embeddedness	0.037	0.062	0.310	0.260	0.440	1,000

Table 2: Descriptive statistics and correlations (authors' calculation).

About H3. As shown in Table 3 and Table 4, the technological context is a background in which, in this scenario, the interaction terms are related with the CVC engagement. The trend of interaction effects is positive but ambiguous, as supposed, implying that although the technological context affects the impact of both CVC operational intensity and CVC ecosystem embeddedness on entrpreneurial outcomes, it does not explain it unequivocally.

Variables	Model 1	Model 2	Model 3	Model 4

Operational intensity (OI)	+***	+***	+***	+***
Ecosystem embeddedness (EE)	/	+***	/	+***
Technological intensity × CVC engagement (OI/EE)	/	+*	+*	/
Controls	Yes	Yes	Yes	Yes
Year & Country	Yes	Yes	Yes	Yes

*Table 3: CVC engagement and innovation outcomes (authors' calculation) (*p < 0.10; **p < 0.05; ***p < 0.01).*

Variables	Follow-on funding	Capital raised
Operational Intensity (OI)	+***	+**
Ecosystem Embeddedness (EE)	+***	+***
Technological intensity × CVC engagement (OI/EE)	?	
Controls	Yes	Yes

*Table 4: CVC engagement and funding outcomes (authors' calculation) (*p < 0.10; **p < 0.05; ***p < 0.01).*

Discussion

The results of the study offer empirical evidence showing that CVC influences entrepreneurial outcomes in several ways that go far beyond just providing financial support (Benkraiem et al., 2023). Focusing on both operational intensity and ecosystem embeddedness, the findings help better understand how corporate investors add value to entrepreneurial environments (Meng et al., 2023), naturally in particular when startups (which constitute the units of analysis in the investigated perimeter).

Both the levels of CVC engagement stand out as crucial factors driving innovation and funding success for startups. Moreover, the varying impact of the technological intensity highlights the significance of contextual factors, indicating that the success of CVC is not just about having corporate investors on board, but also about how and where these venture activities are situated and contextually managed.

These findings seem to strengthen the perspective of CVC as a phenomenon that is deeply embedded in innovation ecosystems and that is constantly driven by capabilities (Weiss and

Kanbach, 2022). More specifically, the success of corporate investments in startups hinges not only on whether corporations choose to invest, but also on the depth of their engagement over time and on their position within those entrepreneurial networks, helping startups or more in general backed firms secure both financial and non-financial resources (Bauer et al., 2024).

Implications

The study seems to reveal several key outcomes with significant scientific implications. One of the main findings highlights the crucial role of CVC in promoting entrepreneurship within innovative settings: this research enhances the existing scientific literature on CVC by framing corporate venture investing as a continuous, learning-oriented entrepreneurial practice instead of just a one-time investment decision (Tootoonchy and Sajadi, 2024). Additionally, it makes a valuable contribution to ecosystem and network studies by establishing a clear link between the network connections of CVC investors and the subsequent entrepreneurial success (Noyes et al., 2014; Baierl et al., 2016; Chen et al., 2023). Lastly, the study points out that the level of technological intensity can influence the analysis of how CVC initiatives might impact different technological profiles (Mayya and Huang, 2025).

The study also seems to reveal several relevant outcomes that have implications for management. One key takeaway is that professional management of CVC initiatives needs focusing on multiple levels (financial, organizational, and so on), going beyond the mere opportunistic investment: the positive impact of operational intensity on entrepreneurial outcomes indicates that successful CVC programs need long-term commitment and focus on organizational learning (Battisti et al., 2022). Secondly, the significance of being embedded in an ecosystem underscores the strategic advantage of actively engaging in venture capital networks (Noyes et al., 2014). Lastly, various technological contexts can affect the overall success of CVC initiatives, necessitating tailored actions that are specific to each industry (Xue et al., 2026).

Conclusion, Limitations, and Future Directions

As regards the potential limitations of this study, there are few important points to consider that could pave the way for future developments. The observational research design makes it tricky to draw causal conclusions, and using publicly available data might lead to some measurement

errors or at least some bias (institutional data normally responds to institutional more than entrepreneurial needs). Therefore, future studies could adopt quasi-experimental designs, delving into the micro-level interactions, maybe also investigating the differences across countries. Additionally, it would be worthwhile to explore some less favorable aspects of the ecosystem embeddedness, such as coordination costs and conflicts of interest.

Going beyond the mere financial perspective, this research shows how CVC influences entrepreneurial outcomes through various avenues of growth, expansion, and development (Röhm, 2018). In this specific investigation, the focus is on ecosystem embeddedness and ongoing engagement, with the related findings that highlight the relevance of contextual factors in the success of CVC initiatives, most of all in startups, from a knowledge-based angle, providing a nuanced understanding of the specific relational and industrial contexts involved (Frey and Kanbach, 2024).

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THE IMPACT OF CHATGPT ON EDUCATION AND ITS INFLUENCE ON THE LABOUR MARKET

Andrea Bencsik[1], Timea Juhasz[2]

Wekerle International University, Budapest, Hungary

University of Sopron, Sopron, Hungary

Keywords: ChatGPT, higher education, knowledge, labour market, personal development, skills, students

Introduction

The digital transformation of higher education has accelerated over the past decade. ChatGPT, a large language model developed by OpenAI, is one of the most significant innovations, capable of natural-language interaction, text generation, summarisation, and explanation (OpenAI, 2023). ChatGPT can improve university students' learning outcomes. Employers point out that labour market expectations are constantly changing as artificial intelligence (AI) develops and its potential applications emerge (Wang, 2026). New professions are emerging, while others are fading into the background. Close collaboration between higher education and the labour market is needed, along with clear communication of expectations, building on the existing and expected skills of young people.

Purpose, Aim, and Objectives

The purpose of this study is to examine the role ChatGPT plays in the learning processes of university students in Mediterranean countries, the areas in which it is most frequently used, and its potential impact on learning, academic performance, and personal and professional development. A further objective is to examine how the use of ChatGPT affects the skills expected in the labour market, the evolving expectations in the workplace, and changes in the nature of work.

Literature Review and Theoretical Framework

According to a study by Cotton et al. (2023), more than 60% of university students use generative AI tools at least occasionally. Research indicates that ChatGPT effectively supports traditional in-class, online, and hybrid learning alike. Its use can contribute to the development of digital skills, the resolution of emerging problems, and improved employability (OECD, 2021). Research on labour demand and skill requirements across various occupations examines

whether generative AI displaces workers or, conversely, complements their work. The research model is shown in the figure below.

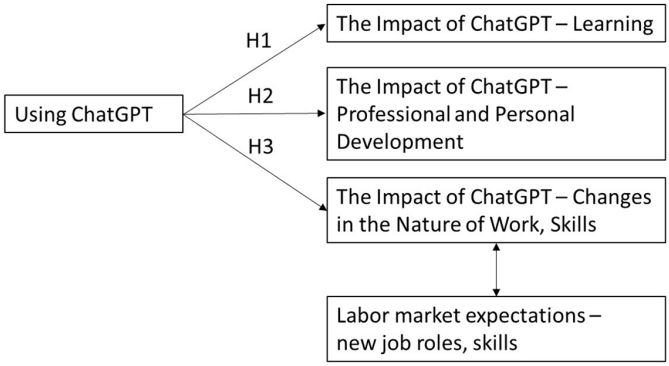


Figure 1: Conceptual framework

Methodology and Methods

This study employed quantitative methods. An online survey was conducted as part of a global research project involving Mediterranean countries. The analysis, performed using SPSS 26, tested three hypotheses using One-Way ANOVA, Welch's ANOVA, and SEM models.

Findings and Contribution

The hypotheses were accepted. The use of AI has a significant impact on individual development, as well as on expectations and changes in the workplace. Knowledge development and personal growth influence changes in the labour market. The use and support of AI explain progress in learning, as well as professional, personal, and knowledge development. The variables examined explain 31% of the changes in the nature of work. In the sample, ChatGPT has an impact, through individual development, on labour market expectations regarding employees, the nature of work, and changes in the skills required by the labour market.

Originality and Value

Most research on ChatGPT consists of theoretical studies and focuses on ethical issues. This research was conducted on a global scale, and its results provide a comprehensive picture of the opinions of young people in the Mediterranean region and their adaptation to labour market changes.

Research Limitations

The main limitation of this study is that its findings are based on a cross-sectional survey. Since AI is evolving so rapidly that it is difficult to keep pace with its progress, a repeat study today would likely provide a more nuanced picture than the current findings.

Theoretical and Practical Applications and Implications

The research findings highlight the importance of understanding the impact of generative AI on the labour market and developing targeted policies to enhance workplace skills (e.g., restructuring the educational framework of higher education institutions, reviewing courses, holding consultation meetings, and supporting students' preparedness). Labour market representatives, employers, and corporate leaders bear responsibility for these processes. A prerequisite for initiating change is understanding young people's preparedness, mindset, fears, and expectations.

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THE DARK SIDE OF ENTERPRISE METAVERSE COLLABORATION: IDENTITY-BASED EFFECTS OF AVATAR CUES IN B2B-ORIENTED PROFESSIONAL INTERACTIONS

Lejealle, C. [1], Khelladi, I. [2], Rezaee Vessal, S. [3]

[1]Department of Marketing, ISC Paris, Paris, France

[2]Department of Marketing, Excelia Group, Cachan, France

[3] De Vinci Higher Education, De Vinci Research Center, Paris, France

Keywords: Enterprise metaverse; Proteus effect; Workplace incivility; Avatar embodiment.

Introduction and purpose

Enterprise-facing immersive platforms or professional metaverses are increasingly positioned as key infrastructures enabling distributed teamwork and client engagement through avatar-mediated interactions (Aliman et al., 2024). While prior literature predominantly focus on adoption and value creation (Kumar et al., 2025), less is known about behavioral risks like non-cooperation or workplace incivility. This gap is critical in B2B contexts, where interactions are repeated and reputation-sensitive. Addressing this limitation, this study pursues three objectives: (1) identify salient avatar-based identity cues and document forms of incivility; (2) develop a dual-path mechanism explaining when negative avatar cues elicit behavioral conformity versus compensation; and (3) examine how these cues relate to collaboration, contingent on avatar embodiment.

Theoretical framework

Grounded in Self-Perception theory, the Proteus effect posits that individuals infer traits from their avatar's appearance and adjust their behavior accordingly (Yee et al., 2009). However, these effects are context-dependent (Beyea et al., 2022). To explain negative outcomes in

professional exchanges, we propose two identity-regulation responses. When avatar cues signal undesirable traits, users may exhibit *behavioral conformity* (reduced cooperation or dismissive interaction). Conversely, when cues threaten professional identity, users may engage in *behavioral compensation* (strategic relational repair to salvage dyadic trust), aligning with dyadic avatar research (Van Der Heide et al., 2013). Furthermore, avatar embodiment — the sense of agency, self-location, and body ownership — acts as a conditional amplification mechanism. Higher embodiment intensifies avatar-based self-inference, strengthening the link between avatar cues and collaborative outcomes (Dupraz et al., 2024).

Methodology

The study adopts a mixed-methods design (Venkatesh et al., 2013). Phase 1 consists of an exploratory qualitative study within a real enterprise metaverse (Jamespot), combining observations and interviews to identify professional avatar cues and dysfunctional interaction patterns. Phase 2 builds on these insights through a controlled experiment manipulating avatar appearance during standardized B2B collaborative tasks (negotiation/decision-making). Incivility and non-cooperation will be quantified using validated behavioral scales to capture deviant behaviors within the immersive environment.

Findings and contribution

This study shifts attention from adoption metrics toward latent behavioral risks and relational harm in B2B exchanges (Dwivedi et al., 2022). It relocates avatar-effects theorizing from leisure to professional settings, distinguishing between Proteus-based behavioral conformity and identity-protective compensation. Finally, it refines embodiment research by showing that body ownership conditionally amplifies — rather than determines — the activation of identity-based processes.

Originality, limitations and implications

The originality lies in moving beyond linear models of behavioral conformity to uncover how professionals actively defend their credibility when confronted with counter-normative digital representations.

Limitations: The controlled experiment relies on standardized tasks that may not fully capture fluid, long-term corporate dynamics. Additionally, platform specificity (Jamespot) and the challenge of measuring fleeting, non-verbal immersive micro-behaviors may limit generalizability.

Implications: Theoretically, it nuances the Proteus effect and extends workplace deviance literature into immersive corporate spaces. Practically, it offers evidence-based guidelines for designing avatar customization parameters in B2B organizations, informs immersive HR onboarding practices, and helps platform architects protect team psychological safety.

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EMBODIMENT, VOICE, AND GESTURES: ANTHROPOMORPHIC DIMENSIONS SHAPING THE ACCEPTANCE OF SOCIAL ROBOTS IN HIGHER EDUCATION

Papavasiliou, Dimitra[1]; Konstantoulaki, Kleopatra[1]; Rizomyliotis, Ioannis[2], Kostopoulos Ioannis[3]

[1] Department of Early Childhood Education and Care, University of West Attica, Athens, Greece

[2] Department of Business Administration, University of West Attica, Athens, Greece

[3]Liverpool Business School, Liverpool John Moores University, Liverpool, United Kingdom

Keywords: social robots, anthropomorphism, voice, gestures, acceptance, consumer psychology, higher education

The rapid advancement of artificial intelligence and robotics has facilitated the gradual integration of social robots into a wide range of social and professional environments. Social robots are artificial intelligence systems that can communicate with humans using socially salient modalities such as speech, gestures, facial expressions, and other nonverbal communications (Gao et al., 2025). This paper presents a conceptual framework examining how anthropomorphic dimensions shape student attitudes and behavioral intention toward social robot use in higher education. In contemporary universities in which students are informed consumers of educational services and increasingly advanced technologies and practices, social robots are being considered as possible agents of instruction in higher education, either for the role of professor or as an assistant professor (Wang and Xue, 2024). Although these roles are still in their infancy, yet they do herald a growing interest in embedding represented artificial agents in the teaching missions of universities and the roles that represented agents might play in higher education. This emerging trajectory makes it increasingly important to examine how learners and educators perceive social robots, particularly the social and communicative cues that influence their acceptance.

User acceptance is a major factor for successful implementation of social robots in service settings. Drawing on the Technology Acceptance Model (TAM) and social presence theory, it is generally known from human-robot interaction research that users are strongly influenced by anthropomorphism when interacting with social robots (Çalişkan and Sevim, 2025). Anthropomorphism refers to user's tendency to ascribe humanlike physical, cognitive and emotional characteristics to non-human agents (Baltaci et al., 2024). In the case of social robots, various anthropomorphic signals, including the physical appearance, voice and

gestural expressiveness of a robot, have been observed to influence users' expectations, affective responses and overall appraisal of robot social presence.

The robot's physical appearance is one of the most salient characteristics that influences the user's attitude towards robots. Robots with a human-like or social expressive features are generally considered as more approachable and socially competent than robots with a mechanical appearance, which may be considered as neutral, efficient and unemotional (Han et al., 2023; Gao et al., 2025b).

Another anthropomorphic signal is the robot's voice, including voice quality (prosody), clear speech, and naturalness, which influence the degree to which users perceive the robot as an intelligible, credible, and socially engaging instructional partner. A more human-like voice can eases warmth, authority, and presence. In contrast, a voice that is more clearly synthetic or monotonic can signal the robot's artificiality and may differentially affect the user’s attitudes towards robots (Hsu and Lee, 2023).

Gestures further enrich the communicative ability of social robots by providing nonverbal cues that complement verbal communication, convey emphasis, and contribute to a more dynamic and embodied instructional style (Çalişkan and Sevim, 2025). Such cues can facilitate comprehension, support cognitive processing, and enhance engagement (Chien et al., 2024).

Critically, however, these dimensions have rarely been examined in combination, limiting our understanding of their interactive effects on student acceptance.Despite growing academic attention to each of these aspects of anthropomorphism, the field lacks a comprehensive conceptual understanding of how appearance, voice, and gestures may influence students' attitudes and intention to use social robots in the role of teacher or teacher-education tool. As higher education institutions continue to adopt technology mediated learning and professional development, insights into human-robot social dynamics are increasingly relevant. This study advances the field by offering an integrated conceptual understanding of how appearance, voice, and gestures jointly shape students’ attitudes and intention to use social robots in educational roles—an area that has not been examined holistically before. A conceptual model is proposed in which appearance, voice, and gesture serve as independent anthropomorphic dimensions predicting student attitudes and behavioral intention, and a set of research propositions is developed to guide future empirical investigation. By clarifying these mechanisms, the work provides actionable insights for higher education institutions and technology developers seeking to design more effective, socially attuned robotic tools for teaching and professional development, including concrete design recommendations

concerning robot appearance, voice calibration, and gestural interaction in educational deployments.

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DIGITAL FINANCIAL INTERVENTIONS: A SYSTEMATIC REVIEW OF EMERGING EVIDENCE

Perdiou, Demetra[1]; Themistocleous, Christos[2]; Karapanos, Evangelos[3]

[1]Department of Communication and Marketing, Cyprus University of Technology, Limassol, Cyprus

[2]Department of Communication and Marketing, Cyprus University of Technology, Limassol, Cyprus

[3]Department of Communication and Internet Studies, Cyprus University of Technology, Limassol, Cyprus

Keywords: Financial Technologies, Behaviour Interventions, HCI, Visual Communication

Background

Digital financial technologies are increasingly reshaping the ways individuals understand and manage their finances. This digital transformation offers unparalleled convenience and accessibility, enabling individuals to manage their financial activities with unprecedented ease (Brika, 2022).

The design of these applications or platforms does not merely facilitate use; it actively shapes user behaviour and decision-making, sometimes in ways that encourage rushed financial decisions. For instance, Kou et al. (2024) analysed Subreddit posts and found a YOLO (You Only Live Once) culture among millennials when it comes to investing, where real risks and prospective implications of bad investments are not accounted for.

Researchers in the Human-Computer Interaction (HCI) and Persuasive Technology communities have recently started exploring ways to improve financial behaviours and decisions in digital financial interventions. For instance, Hu et al. (2023) proposed the *Financial Decision Buddy*, an app aiming to bridge the education gaps of financial illiteracy by providing support for real-time purchasing decisions and short-term budgeting. Chaudhry et al. (2022) introduced *Robinhood's forest*, an idle app game, that uses different types of trees within a forest as an analogy of a diversified portfolio nudging consumers towards the latter desired behaviour. Despite these insights, the literature on digital finance remains fragmented, with limited integration of how cognitive biases shape behaviours and decision-making across these domains (Themistocleous & Karapanos, 2025).

In this paper, we report on a systematic literature review that seeks to investigate and address this gap by mapping the range of financial decisions targeted by digital interventions and evaluating how cognitive biases are incorporated into the design of these digital interfaces. The review aims to answer the following research questions.

RQ1: *What are the main financial behaviours tackled by digital financial interventions?*

RQ2: *Which populations do digital financial interventions target?*

RQ3: *What types of interventions are most commonly employed?*

Method

Financial Focus: Research articles needed to target a financial behaviour such as increasing savings, reducing spending, improving financial investments or providing access to credit.

Digital Intervention: Eligible articles needed to present the design, or evaluation or design and evaluation or a clear proposition for an intervention in a digital format. Interventions leveraging, for example, gamification, education, information, visualisation or reminders were deemed relevant.

Process: We included studies published in the top twenty Human-Computer Interaction journals and conferences according to Google Scholar rankings. Our search strategy aimed to capture articles situated at the intersection of Human-Computer Interaction, Finance and Behavioural Science using the following keywords:

Financial OR Invest OR Saving* OR Gambl* OR Trading OR Stock Market OR Financial Literacy OR Pension AND Digital Intervention**

Two independent reviewers screened titles, abstracts, and full texts following standard PRISMA procedures. Out of 618 a total of 21 articles remained for the final analysis stage.

Analyses: The analyses were designed to uncover the conceptual and empirical patterns underpinning digital interventions for financial decision-making. It focused on four dimensions: Targeted financial behaviour; Type of intervention; Groups being targeted (general or specialised group); The analysis of the intervention design. For the intervention type analysis, we coded papers based on whether they employed infographics, illustration and iconography, typography, nudges or procedural friction when designing their intervention.

Results: Preliminary findings show three main categories of targeted financial behaviours - savings, investments and access to credit. 12 of 21 articles (57.14%) did not use any visuals as an intervention method, while 9 of 21 articles (42.86 %) employed some form of diagrammatic representation. The prevalence of text-based or functional interfaces, particularly in investment-focused interventions, highlights a clear gap and opportunity for future research to leverage richer visual representations to support financial behaviour and enhance comprehension, especially within interventions.

Implications

The results indicate that the digital financial interventions should adopt a more inclusive and user-centred interface designs to address the diverse needs of users across demographic groups and with different medical conditions. Specifically, developed interventions focus on handling spending for older individuals yet research can be expanded to also improve investment decisions. Likewise, people with medical issues are nudged to save more money yet intervention relating to other financial aspects (like access to credit and loan management) have not been examined. As the range of financial decisions is vast, there is a strong tendency of HCI research to focus on entry level financial decisions like reducing spending and increasing savings. Investment decisions relating to NFTs, Index Funds, Crypto and how users can be nudged or educated to improve their choices are theoretically underdeveloped in the digital intervention domain. Future research should explore how demographic characteristics influence the effectiveness of digital financial interventions and whether tailored interface designs lead to more equitable financial outcomes. Consequently, behavioural outcomes may differ significantly across demographic groups, highlighting the need for more inclusive and accessible interface designs.

Contributions

This study offers original value by providing a systematic understanding of how digital financial interventions target behaviours and decisions while incorporating cognitive biases. It highlights a clear gap in the limited use of visual elements, offering insight into how design can better support user understanding as digital financial technologies increasingly reshape how individuals interact with and manage their finances, while also clarifying the current landscape of such interventions.

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SOCIO-TECHNICAL TRANSFORMATION IN NGOS: TRANSFORMING RURAL EDUCATION AND DEVELOPMENT THROUGH DIGITAL PROJECTS

Endress, Tobias[1]; Manandhar, Ashna[1]

[1] School of Management, Asian Institute of Technology (AIT), Bangkok, Thailand

Keywords: Digital Transformation; Non-Governmental Organizations (NGOs); Digital Projects; Open-Source Innovation; Digital Governance; Accountability Infrastructure; Socio-Technical Systems; Thailand; Responsible Innovation

Abstract

Digital transformation research has predominantly examined corporate settings, platform competition, and enterprise system implementation. Far less attention has been paid to digital transformation projects in hybrid institutional environments in which NGOs, schools, and international donors interact through digital infrastructures. In such contexts, digital platforms do not merely improve efficiency but reshape governance, accountability, and stakeholder relationships. This study conceptualises and examines a digital reporting platform developed to connect rural schools in Thailand with international donors, positioning the initiative as a digital transformation project embedded in a socio-technical ecosystem.

Introduction

Digital transformation research has predominantly examined corporate settings. Far less attention has been paid to digital transformation projects in non-profit organizations. This study conceptualises and examines a digital reporting platform developed to connect rural schools in Thailand with donors, positioning the initiative as a digital transformation project embedded in a socio-technical ecosystem.

The project emerged through a multi-phase process. First, the idea was developed collaboratively with a Thailand-based NGO supporting rural education initiatives, identifying fragmented reporting and limited donor transparency as central challenges. Second, the concept was further refined during the *Unite for Action: Social Impact Hackathon 2025* (AIT School of Management, Rotary Bangkok DACH, & iCare Thailand, August 30–31, 2025), where

interdisciplinary student teams contributed to solution design, user flows, and governance logic. Third, an operational prototype was developed and released as open-source software (Endress, 2026), thereby enhancing transparency in the system architecture and encouraging community contributions. Finally, a pilot implementation and structured data migration from legacy records were completed in December 2025, marking the transition from conceptual innovation to operational deployment. The platform is designed to operate across constrained connectivity environments, enabling offline data capture within rural schools and subsequent synchronisation to cloud-based systems once network access becomes available. This staged development process reflects a digital project lifecycle perspective, linking ideation, co-creation, prototyping, deployment, and pilot evaluation. The initiative is therefore examined not merely as a technology artefact but as a digital transformation project that restructures reporting routines and accountability mechanisms.

Study Design and Methodology

The study draws on three complementary theoretical perspectives. First, digital transformation is conceptualised as a socio-technical change process involving organisational reconfiguration rather than simple digitisation (Vial, 2019). Second, the project is analysed through the Information Systems Success Model and technology acceptance frameworks to assess perceived usefulness, ease of use, and trust (Venkatesh *et al.*, 2003). Third, digital infrastructure theory informs the interpretation of the platform as an accountability infrastructure embedded within governance structures (Tilson *et al.*, 2010). Ethical-by-design considerations further frame the analysis of privacy and power asymmetries in data collection involving vulnerable populations (Floridi *et al.*, 2018).

The research addresses four questions: How do rural teachers perceive the usability and usefulness of the reporting platform? How does structured digital reporting influence consistency and administrative workload? What ethical tensions arise in digital data governance within rural educational contexts? And how does increased digital transparency reshape accountability relations between NGOs, teachers, and donors?

Methodologically, the study adopts a single-case mixed-methods design, combining quantitative and qualitative data in a single case to gain a comprehensive understanding of the phenomenon. A structured teacher questionnaire captures perceived ease of use, perceived usefulness, administrative burden, trust in data governance, and ethical comfort with data

sharing. These measures are complemented by qualitative, open-ended responses that explore perceived empowerment, concerns about monitoring, and challenges of contextual adaptation. Given the exploratory nature of the pilot phase, the analysis focuses on early-stage observations rather than statistically generalisable findings.

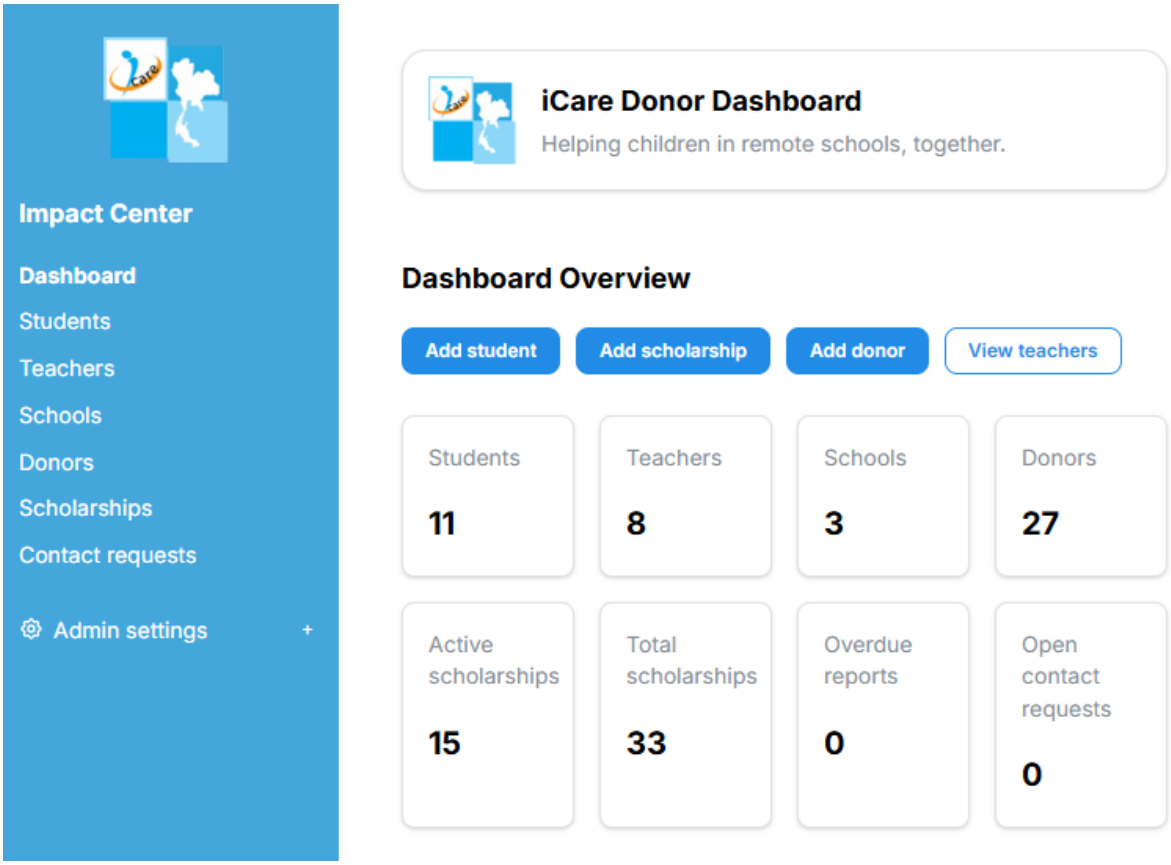


Figure 1: *Early-stage prototype of the reporting application populated with test data during development.*

The embedded researcher–practitioner role is explicitly acknowledged. As the author was involved in ideation and design phases, reflexive documentation is incorporated to mitigate bias and enhance transparency, aligning with calls for greater methodological openness in digital transformation research.

Findings

Preliminary findings from the December 2025 pilot indicate that the reporting platform has been integrated into routine documentation practices within participating rural schools. The introduction of standardised reporting templates increased consistency across submissions and reduced ambiguity in donor-facing communication. Initial observations suggest that while participants describe enhanced clarity in reporting expectations and improved organisational

structure, several express heightened awareness of external visibility resulting from structured data transparency. Concerns regarding student data sensitivity, consent clarity, and long-term control over information flows emerge as central to trust formation. These findings suggest that the platform's influence extends beyond administrative efficiency to shifts in perceived accountability and oversight within the educational ecosystem.

Discussion and Conclusion

The preliminary findings indicate that the platform operates as a digital governance mechanism rather than solely an administrative reporting tool. Standardised reporting templates enhance comparability and donor transparency while simultaneously formalising teacher accountability within the reporting process. Increased data visibility also introduces asymmetries in informational control, as donors gain enhanced oversight while teachers experience greater exposure to external evaluation (Zuboff, 2019). Although participants report improved clarity, structure, and consistency in documentation practices, increased external visibility reshapes perceptions of oversight and responsibility. This dual effect reflects a balancing of efficiency gains with process innovation in reporting practices, aligning with broader notions of organisational ambidexterity in digital transformation contexts (Verhoef *et al.*, 2021). These dynamics reinforce the interpretation of the platform as an accountability infrastructure embedded within an ecosystem, where digital transformation extends beyond efficiency gains to the reconfiguration of reporting routines and governance relations (Tilson *et al.*, 2010).

Conceptually, the study extends digital transformation research to rural education contexts, demonstrating how digital projects restructure institutional relationships beyond corporate environments. The staged lifecycle, from collaborative ideation and hackathon-based co-creation to open-source prototyping and pilot deployment, illustrates how governance outcomes are embedded in project design and implementation processes. Ethical considerations regarding student data sensitivity and consent transparency are central to long-term trust and adoption. Overall, digital teacher–donor platforms represent transformation initiatives whose effectiveness depends on institutional alignment, transparent governance architecture, and sustained stakeholder trust rather than technological functionality alone.

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POSSESSION WITHOUT PURCHASE: THE MEDIATING ROLE OF PSYCHOLOGICAL OWNERSHIP ON EVALUATION OF ONLINE SHOPPING SESSION

Pikturnienė, Indrė[1]; Degutis, Mindaugas[1]

[1] Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania

Keywords: Online Purchase, Online Shopping Cart Abandonment, Cart Collection, Psychological Ownership, Evaluation of Online Session.

Introduction

Consumers collect online carts not only as a functional step to purchase, but also for hedonic reasons – self-entertainment, boredom relief, or curiosity – which often leads to cart abandonment (Close and Kukar-Kinney, 2010). Nevertheless, satisfaction with the session results might arise from psychological ownership of the online cart, that is, the feeling that items belong to the customer (Atasoy and Morewedge, 2018). This sense generates positive emotions among non-purchasers and reduces regret associated with non-intended purchase among purchasers.

The purpose of the research is to determine whether hedonic online cart collection leads to positive evaluation of online session results, mediated by psychological ownership, and how this pattern differs between cart abandoners and purchasers. We hypothesise that the relationship between hedonic cart collection and session evaluation is mediated by psychological ownership of the cart, and that abandoners vs. purchasers will demonstrate distinct paths due to goal-outcome (in)congruence.

Methodology

A panel survey in Lithuania was conducted in January 2026 (N=621; 232 male, 389 female; aged 18–65). Respondents were grouped using the criterion of whether they had abandoned the online purchase session (N=311) or purchased online (N=310) within the past 6 months, and instructed to respond about the filtering situation – cart abandonment or purchase.

7-point Likert scales were: Hedonic Cart Collection (HedCartCol) (N=3, Cronbach's Alpha= .803) (Close and Kukar-Kinney, 2010), Psychological Ownership of collected cart (PsyOwn) (N=3;

Cronbach's Alpha= .923) (Atasoy and Morewedge, 2018), and cognitive evaluation of the session result (SessionCogEval), operationalised as perceived completion of the browsing session as planned, perceived goal attainment, and subjective evaluation of the session outcome as successful (N=3; Cronbach's Alpha= .861). We tested the impact of HedCartCol on SessionCogEval, mediated by PsyOwn, in two separate groups, abandoners vs. purchasers (SPSS Process Macro, model no.4).

Findings

Mediation models for both groups were significant: Abandoners $R^2 = .0694$, $F(2,308) = 11.39$, $p < .001$; Purchasers $R^2 = .0690$, $F(2,307) = 11.995$, $p < .001$.

For abandoners, HedCartCol predicted SessionCogEval via PsyOwn: the total effect of HedCartCol to SessionCogEval from significant ($b = .152$, $p = .005$) became non-significant when PsyOwn was included in the model ($b = .031$, $p = .623$). HedCartCol predicted PsyOwn ($b = .511$, $p < .001$), which in turn predicted SessionCogEval ($b = .236$, $p = .002$). Bootstrap analysis (5,000 samples, 95% CI) confirmed an indirect effect ($ab = .121$, 95% CI [.051, .195]) of PsyOwn on SessionCogEval.

A different path was observed among purchasers. HedCartCol predicts SessionCogEval negatively directly ($b = -.169$, $p = .001$) and in the mediation model ($b = -.243$, $p < .001$). When PsyOwn was added to the model, both mediating relationships turned into positive: HedCartCol predicted PsyOwn ($b = .479$, $p < .001$), and PsyOwn predicted SessionCogEval $b = .155$, $p < .001$); a significant indirect effect through PsyOwn ($ab = .074$, BootSE = .025, 95% CI [.0295, .1283]) was confirmed.

Contribution, Implications, Limitations

Evidence that psychological ownership is a significant explanator linking hedonic online cart collection and the evaluation of session results for purchasers vs abandoners provides new insights. Hedonically collected cart, even if abandoned, evokes psychological ownership and leads to a positive evaluation of the session. Hedonic collectors who later purchased were less satisfied unless they had elaborated psychological ownership of the cart. If the cart is psychologically pre-owned, the evaluation of the session turns positive. This can be interpreted as an incompatibility between

cart-collection motives and the outcome, likely resulting in cognitive dissonance due to an unplanned purchase, outweighed by the perceived ownership effect.

Data suggests that for hedonic shoppers, the cart is a possession space. To maximise satisfaction (and CLV), managers must pivot from 'pushing for conversion' to 'facilitating ownership,' turning happy abandoners into loyal advocates and regretful buyers into confident owners.

Future research should manipulate online shopping conditions to determine what increases psychological ownership and the path to purchase, controlling for emotional and cognitive factors. The limitation is self-reported data regarding recent behaviour.

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WHEN DOES CONSUMER ECO-LITERACY TRANSLATE INTO BEHAVIOURAL INTENTIONS TOWARDS SUSTAINABLE COSMETICS? THE ROLE OF GREENWASHING CONCERNS

Pumputyte, Milda[1]; Banyte, Jurate[2]; Dovaliene, Aiste[2]; Gadeikiene, Agne[2]

[1] Kaunas University of Technology and UAB Bio Sala, Kaunas, Lithuania

[2]School of Economics and Business, Kaunas University of Technology, Kaunas, Lithuania

Keywords: Consumer Eco-Literacy, Behavioural Intentions, Sustainable Cosmetics, Greenwashing Concerns.

Introduction

Consumer eco-literacy is increasingly recognised as an important factor shaping sustainable consumption decisions. By helping consumers understand environmental issues and assess sustainability-related information, eco-literacy may encourage more responsible purchasing choices. Prior research generally confirms a positive relationship between eco-literacy and intention to buy sustainable products; however, evidence on willingness to pay a price premium remains less consistent. This suggests that eco-literacy does not always translate directly into behavioural intentions. Consumer concern about greenwashing may help explain this relationship. The growing use of vague or misleading sustainability claims has increased scepticism towards sustainability-related communication. Sustainable cosmetics represent a particularly relevant context, as environmental and ethical claims are frequently emphasised but often difficult for consumers to verify. At the same time, cosmetics are closely associated with personal health and environmental impact, making them suitable for examining how eco-literacy relates to behavioural intentions under conditions of greenwashing concern.

The Aim and Theoretical Background

The study aims to assess the impact of consumer eco-literacy on two behavioural intentions: intention to buy and willingness to pay a price premium, while considering the moderating role of greenwashing concerns.

Consumer eco-literacy refers to consumers' ability to understand environmental issues and critically evaluate sustainability-related information. Although early research conceptualised eco-literacy mainly as environmental knowledge, recent studies emphasise behavioural

awareness and the practical application of knowledge (Wei et al., 2018). Accordingly, this study adopts a two-dimensional perspective on eco-literacy, distinguishing between environmental knowledge and understanding, and awareness reflected in practical actions. Prior findings generally confirm a positive relationship between eco-literacy and intention to buy sustainable products, whereas evidence on willingness to pay a premium remains inconclusive. This inconsistency may be explained by greenwashing concerns, understood as consumers' scepticism towards firms' sustainability claims and labels (Rejikumar, 2016; Riaz et al., 2023). Such concerns may weaken the extent to which environmentally literate consumers translate their knowledge and awareness into behavioural intentions.

Methodology and Methods

The empirical study is based on a quantitative survey of 482 Lithuanian consumers who had prior experience purchasing sustainable cosmetic products and possessed basic sustainability-related knowledge. Data were collected using an online questionnaire. Consumer eco-literacy was measured using scales adapted from prior studies, following a two-dimensional structure comprising knowledge and understanding, and awareness and practical actions. Behavioral intentions were operationalized as intention to buy sustainable cosmetics and willingness to pay a price premium. Greenwashing concerns captured respondents' scepticism towards sustainability-related claims. The proposed relationships were tested using regression and moderation analysis.

Findings

The results indicate that consumer eco-literacy is positively related to intention to buy sustainable cosmetics, whereas its direct relationship with willingness to pay a premium is weak. Awareness and practical actions are more strongly associated with intention to buy than knowledge and understanding. Furthermore, greenwashing concerns significantly weaken the relationship between consumer eco-literacy and intention to buy sustainable cosmetics. The effect is weaker for willingness to pay a premium, suggesting that price-related decisions may depend on factors beyond the scope of this study.

Research Limitations

The study is limited to a single product category and national context, which may restrict the generalizability of the results. In addition, behavioural intentions rather than actual purchasing

behaviour were analysed.

Contribution and Implications

This study contributes to sustainable consumption literature by supporting a two-dimensional conceptualisation of consumer eco-literacy and demonstrating that its dimensions differ across behavioural intentions. By integrating greenwashing concerns as a moderator, it explains why environmentally literate consumers may not always demonstrate stronger behavioural intentions. Practically, the results emphasise the need for transparent and credible sustainability communication, as increasing consumer eco-literacy alone may be insufficient to encourage sustainable purchasing if greenwashing concerns persist.

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FUNDING THE WANT, NOT THE NEED: SELF-TRANSFORMATION AND MORAL EMOTIONS IN DESIRE-BASED CROWDFUNDING

Leonidou, Sophia[1]; Voutsa, Maria C.[1]; Tsapatsoulis, Nicolas[1]

[1]Department of Communication and Marketing, Cyprus University of Technology, Limassol, Cyprus

Keywords: Donation-Based Crowdfunding; Desire-Based Crowdfunding; Self-Transformation; Emotional Intelligence; Moral Emotions; Perceived Responsibility; Generation Z; Donation Intention

Introduction

Donation-based crowdfunding has emerged as a prominent form of digital philanthropy, enabling individuals to mobilize financial resources through online platforms and distribute contributions. While prior research has primarily focused on need-based campaigns driven by urgency, altruism, and moral obligation, an increasing number of campaigns now support personal desires and non-essential goals. This emerging form, referred to as desire-based crowdfunding, challenges traditional assumptions regarding donor motivations and highlights the need to better understand the psychological mechanisms underlying giving behavior (Mollick, 2014). To address this gap, this study introduces desire-based crowdfunding as a distinct research context, investigating whether giving for non-essential goals is driven by self-transformation or alternative moral mechanisms.

Purpose, Aim and Objectives

The purpose of this study is to examine how donation intention is formed within desire-based crowdfunding contexts. The main aim is to investigate whether giving is driven by self-transformation or by alternative psychological mechanisms. The study addresses the following objectives: (1) examine the effect of desire type (material vs.

experiential) on donation intention; (2) assess the mediating role of perceived self-transformation; and (3) evaluate the moderating role of altruism and emotional intelligence. The research further explores how these mechanisms operate among Generation Z, an underexplored but increasingly relevant donor group.

Literature Review and Theoretical Framework

Existing literature identifies donation behavior as a multidimensional process shaped by altruism, empathy, identity, and social influence (Bagheri et al., 2019; Wang et al., 2019). However, most studies focus on need-based contexts and emphasize prosocial motivations. Emerging perspectives suggest that giving may also generate internal benefits such as identity construction, emotional fulfillment, and psychological change.

This study is grounded in Social Exchange Theory (Homans, 1958), which conceptualizes donation as a value-driven exchange involving anticipated psychological rewards, and Schwartz's Theory of Basic Human Values (Schwartz, 1992). Drawing on these frameworks, self-transformation is theorized as a central mechanism because funding non-essential desires is expected to fulfill self-actualization needs; it allows donors to construct identity, experience vicarious joy, and achieve psychological change by fulfilling others' wants. Building on these frameworks, the study introduces self-transformation as a proposed motivational pathway and integrates emotional intelligence as an individual-level factor influencing emotional processing in donation contexts.

Methodology and Methods

Data were collected through a self-administered online questionnaire distributed via Prolific (N = 246, Generation Z participants, U.S.). A 2×2 experimental design was employed, manipulating desire type (material vs. experiential) and product involvement (low vs. high), after a pre-test. Participants were randomly assigned to conditions and exposed to standardized mock-ups of crowdfunding campaigns. All constructs demonstrated satisfactory reliability (Cronbach's $\alpha > .70$). Data were screened for quality and analysed using SPSS, including manipulation checks, MANCOVA, and moderated mediation analysis (PROCESS Model 63).

Findings and Contribution

Contrary to theoretical expectations, self-transformation did not significantly mediate donation intention. Instead, moral emotions ($\beta = .446$, $p < .001$) and perceived responsibility ($\beta = .472$, $p < .001$) emerged as the primary mechanisms explaining giving behavior. Notably, material desires generated significantly higher donation intentions and contribution levels than experiential desires, particularly under high involvement and high altruism conditions ($\beta = -.347$, $p = .041$, 95% CI [−.680, −.015]). This suggests that tangible, easily evaluable material goals reduce donor uncertainty and provide concrete evidence of impact, whereas subjective experiential desires are harder to assess. Furthermore, emotional intelligence acts as a key boundary condition: individuals with lower emotional intelligence exhibit weaker moral responses and reduced willingness to contribute, especially in experiential contexts ($\beta = -.208$, 95% CI [−.384, −.063]). These results suggest that donation behavior in desire-based crowdfunding is driven more by moral activation than by identity transformation.

Originality and Value

This study contributes by introducing desire-based crowdfunding as a distinct research context and by challenging the assumption that self-transformation is a central driver of giving. However, these contributions are constrained by the study's empirical design—specifically, its reliance on a single country (the U.S.). Generation Z sample, self-reported measures, and experimental scenarios rather than actual donation behavior—and thus represent a cautious, foundational step rather than definitive behavioral outcomes.

Research Limitations

The study is limited by its reliance on a single-country sample (U.S.) and self-reported data, which may affect generalisability. Additionally, experimental scenarios may not fully capture real-world donation behavior.

Theoretical and Practical Applications and Implications

Theoretically, the findings refine Social Exchange Theory by emphasizing emotional and individual-difference mechanisms in donation behavior. Practically, they suggest that campaign effectiveness depends on activating moral emotions and perceived responsibility, particularly for non-essential causes.

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PHYGITAL GASTRONOMY: BLENDING EXPERIENCES BETWEEN PARADOXES AND AUTHENTICITY

Civera, Chiara[1]; Mosca, Fabrizio[1]; Chiaudano, Valentina[1]; Tamiazzo, Mattia[1]; Shakil, Hafsa[1]

[1]Department of Management, University of Turin, Turin, Italy

Keywords: Phygital, Gastronomy, Value Co-creation, Service-Dominant Logic, Authenticity, Experiential Value.

Extended Abstract

The gastronomic experience has evolved from a functional act of nourishment into a complex and multidimensional form of experiential consumption. Rather than being confined to the moment of eating, gastronomy is increasingly conceptualised as a dynamic process unfolding across cognitive, sensory, social, and symbolic dimensions. Food-related experiences encompass anticipating, selecting, co-creating, tasting, sharing, and remembering culinary encounters, extending beyond physical consumption and embedding themselves within broader emotional and cultural frameworks.

From a Service-Dominant Logic (SDL) perspective (Vargo & Lusch, 2008), value in gastronomy is not embedded in tangible outputs but emerges through resource integration. Gastronomy constitutes a paradigmatic domain for examining value co-creation, inherently involving sensory participation, emotional engagement, and symbolic meaning-making. The rapid integration of digital technologies, such as artificial intelligence, augmented reality, virtual reality, mixed reality, and 3D food printing, is reshaping how customers interact with food, space, and service providers. Luxury restaurants are evolving into hybrid environments, driving *phygitalization*: the seamless integration of physical and digital elements into a unified experiential continuum (Batat, 2024). This paradigm shift extends traditional quality dimensions by incorporating digital overlays using phygital connectors across the entire dining experience (Batat, 2021). For example, Sublimotion integrates molecular gastronomy with immersive projections and synchronised soundscapes, while Ultraviolet curates sensory stimuli through audiovisual and environmental control to intensify emotional responses. These formats reflect dining experiences situated within digitally mediated spatial-temporal

configurations, where physical and digital boundaries become imperceptible. However, technological enhancement does not inherently generate experiential value. Digital gastronomy must preserve sensory coherence to sustain experiential flow (Spence & Velasco, 2025). When technological mediation becomes excessive or intrusive, it may produce cognitive overload, weaken perceptions of authenticity, and disrupt engagement. Phygital gastronomy is therefore characterised by structural tensions between immersion and overload, authenticity and spectacle, and personalisation and perceived artificiality.

Although research on digital dining is expanding, significant gaps remain. Richards (2021) calls for more empirical investigation of gastronomic experiences within evolving technological contexts. Existing literature concentrates on isolated technologies or controlled settings, without systematically examining how phygital restaurant experiences are evaluated in real-world environments, where insights on adoption barriers, perceived risks, and best practices remain limited (Bartoli et al., 2025). We address these gaps by answering the following research question: *How does the phygitalization of the luxury gastronomy experience generate experiential paradoxes, and how do these paradoxes influence authenticity?*

Given the subjective and phenomenological nature of gastronomic experiences, we adopt a qualitative multiple-case study design (Yin, 2018). We analysed 3,500 reviews from Google My Business and TripAdvisor for ultra-luxury vanguard restaurants, including Alchemist and Sublimotion, encompassing the complete experiential journey. Using Leximancer for thematic analysis, we clustered narratives across tangible and intangible dimensions, coding for authenticity enablers and barriers triggering paradoxes. Furthermore, to ensure scientific rigor and minimise bias, two independent authors analysed and discussed the results with all authors. A third independent author reviewed the contentions, offering specialised insights to inform an unbiased, robust qualitative consensus.

Expected results indicate a shift from technological affordances to lived experiences and extend SDL by framing digital technologies as operant resources whose value depends on interpretative and sensory integration. We identify experiential facilitators and barriers, highlighting that technological enhancement generates value only when aligned with experiential coherence and customer expectations.

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GLOBAL STRATEGY AND DIGITAL INNOVATION FOR NGO YOUTUBE ENGAGEMENT: ONLINE SENSORY MARKETING AND CINEMATOGRAPHIC EXECUTION

Avgeropoulou, Aikaterini[1]; Papasolomou, Ioanna[2]; Melanthiou, Yioula[3]

[1]School of Business, University of Nicosia, Nicosia, Cyprus

[2]School of Business, University of Nicosia, Nicosia, Cyprus

[3]Cyprus University of Technology, Limassol, Cyprus

Keywords: Online Sensory Marketing, Strategic Business Communication, Cinematography, NGOs, YouTube, CSR, Digital Storytelling

Introduction

In a landscape of digital saturation and socio-economic uncertainty, NGOs must go beyond mere visibility and actively enhance audience engagement with their mission to ensure long-term survival (Avgeropoulou & Melanthiou, 2021; Cordery et al., 2023). Hence, the present research integrates Online Sensory Marketing (OnSenM) with micro-level cinematographic execution to increase audience engagement in NGO YouTube campaigns. Its core theoretical contribution is the development of an S-O-R-based framework that maps how designed audiovisual stimuli activate internal psychological states and translate into measurable audience outcomes. While focusing on the nonprofit sector, the framework is commercially transferable, offering for-profit organizations a scalable mechanism to optimize user interactions through strategically engineered, multisensory digital environments.

Purpose, Aim and Objectives

Although sensory marketing has gained prominence in consumer behavior research (Krishna, 2012; Antunes & Verissimo, 2024; Wörfel et al., 2022), its application in audiovisual storytelling remains underdeveloped, especially in mission-driven, resource-limited contexts. This study addresses that gap by showing how sensory cues, visual, auditory, and linguistic, can be enhanced through cinematographic techniques such as framing, rhythm, color, and motion to foster deeper consumer engagement (Dessart & Pitardi, 2019). These techniques evoke psychological mechanisms like vividness, emotional arousal, and narrative transportation (Van Laer et al., 2014; Teixeira et al., 2012; Armstrong & Cutting, 2023).

Literature Review and Theoretical Framework

Using the Stimulus-Organism-Response (S-O-R) model (Mehrabian & Russell, 1974), this research explores how OnSenM influences digital engagement behaviors via internal psychological mediators in online environments (Eroglu, et al., 2001; Petit et al., 2019). The proposed framework positions cinematographic and storytelling cues as designed sensory

stimuli (S) that activate internal affective and cognitive states, including emotional arousal, vividness, and narrative transportation (O). These internal states, in turn, drive audience outcomes such as attention, recall, emotional intensity, and engagement intentions (R). The study further identifies e-literacy as a selective moderator of the stimulus-organism pathway, recognizing that digital proficiency shapes how audiences interpret and respond to complex sensory cues, particularly for recall and engagement (Ng, 2012).

Methodology and Methods

The study employs a mixed-methods design that integrates qualitative and quantitative approaches to provide a comprehensive understanding of user engagement. A netnographic analysis was conducted on YouTube campaigns by globally recognized NGOs, with content systematically coded using OnSenM attributes and cinematographic micro-elements (Kozinets, 2015). In parallel, a quantitative survey (N=294) measured how combinations of sensory and audiovisual elements shaped viewer responses. Key metrics included emotional intensity, perceived authenticity, message retention, and intent to support (Hamacher & Buchkremer, 2022). The mixed-methods approach enables a multidimensional exploration of NGO campaign strategies and audience responses.

Main Findings and Contribution

Quantitative findings reveal that both perceived cinematographic techniques and storytelling clarity are significantly and positively associated with all four audience outcomes, emotional intensity, attention, recall, and engagement intentions (rs range: .270-.456, all $p < .001$). E-literacy functions as a selective moderator, with its effect most pronounced for recall and, to a lesser extent, engagement intentions. Netnographic analysis further indicates that sensory techniques are more effective when paired with intentional cinematographic execution, such as close-up framing, ambient audio, slow-motion, and rhythmic editing. These methods enhance viewer attention, message recall, emotional connection, and credibility. The model provides a scalable, resource-efficient strategy for producing emotionally impactful content, especially vital for NGOs and small-scale initiatives.

The contribution is threefold: first, it reframes OnSenM as a strategic, designable cue system rather than a passive sensory experience; second, it demonstrates how digital storytelling can be operationalized through precise, measurable audiovisual micro-decisions; and third, it provides empirical evidence for the framework's transferability to business settings, particularly in CSR, sustainability branding, and purpose-driven marketing.

Originality and Value

For organizations dealing with audience fatigue and limited budgets, the proposed framework offers a psychologically grounded engagement strategy. It is especially relevant in multicultural

and digital-first contexts. Although centered on YouTube, these principles are adaptable to other platforms like TikTok and Instagram.

Research Limitations

Key limitations include its platform-specific focus and the cultural variability in decoding sensory stimuli. Further research could explore its application in commercial sectors and different digital ecosystems across global contexts.

Theoretical and Practical Implications

Theoretically, the study extends the S-O-R model into the domain of online audiovisual content by demonstrating that cinematographic and storytelling cues function as designable sensory stimuli with measurable effects on audience cognition and behavior. Practically, the finding that both types of cues significantly enhance recall and engagement, and that e-literacy moderates these effects, suggests that content creators can prioritize specific low-cost audiovisual decisions, such as close-up framing and rhythmic editing, to improve campaign effectiveness. While rooted in the NGO sector, the framework is relevant for businesses that aim to design innovative, sustainable, and emotionally resonant digital strategies.

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HOW ENTERPRISE SOCIAL NETWORK-SUPPORTED KNOWLEDGE SHARING ENHANCES EMPLOYEE INNOVATIVE BEHAVIOR: A CREATIVE SELF-EFFICACY MODERATION MODEL

Paulienė Rasa, Tamaševičius Virginijus, Rudžiūnaitė Greta, Stankevičienė Jelena, Michael Christofi

Faculty of Economics and Business Administration, Vilnius University, VU, Vilnius, Lithuania

Keywords: Enterprise Social Network, Knowledge Sharing, Employee Innovative Behavior, Creative Self-efficacy.

Abstract

This study examines how the use of enterprise social networks (ESN) relates to employee innovative behaviour via knowledge sharing and under the boundary condition of creative self-efficacy. Knowledge is widely recognized as a strategic asset for organizations (Ollier-Malaterre & Redston, 2025), and knowledge sharing - active exchange among organizational members - drives innovation and performance (Wang et al., 2025). When employees are unwilling to share knowledge, organizational growth and advantage are jeopardized. ESN - organizational social media used for communities, problem solving, and task management - are increasingly leveraged for knowledge sharing and innovation (Olfat, 2025), yet prior work often focused narrowly on productivity or single ESN dimensions. Innovation - the basis of competitive advantage - emerges from employees' innovative behaviour (Hamid et al., 2025) and is strengthened by creative self-efficacy (Khan et al., 2023). We therefore test a model incorporating ESN use, knowledge sharing, employee innovative behaviour, and creative self-efficacy. Hypotheses:

H1a: The consumptive use of an enterprise social network positively influences knowledge sharing.

H1b: The contributive use of an enterprise social network positively influences knowledge sharing.

H1c: The hedonic use of an enterprise social network positively influences knowledge sharing.
H1d: The social use of an enterprise social network positively influences knowledge sharing.
H2: Knowledge sharing positively influences innovative behaviour.
H3: Creative self-efficacy positively moderates the relationship between knowledge sharing and innovative behaviour: the relationship is stronger when creative self-efficacy is high.
H4a: Knowledge sharing mediates the relationship between the consumptive use of an enterprise social network and innovative behaviour.
H4b: Knowledge sharing mediates the relationship between the contributive use of an enterprise social network and innovative behaviour.
H4c: Knowledge sharing mediates the relationship between the hedonic use of an enterprise social network and innovative behaviour.
H4d: Knowledge sharing mediates the relationship between the social use of an enterprise social network and innovative behaviour.
H5a: Creative self-efficacy moderates the indirect effect of consumptive use of an enterprise social network on innovative behaviour via knowledge sharing.
H5b: Creative self-efficacy moderates the indirect effect of contributive use of an enterprise social network on innovative behaviour via knowledge sharing.
H5c: Creative self-efficacy moderates the indirect effect of hedonic use of an enterprise social network on innovative behaviour via knowledge sharing.
H5d: Creative self-efficacy moderates the indirect effect of social use of an enterprise social network on innovative behaviour via knowledge sharing.

A cross sectional survey (n = 313) used validated scales (Kügler & Smolnik, 2014; Lu et al., 2006; Hu et al., 2009; Tierney & Farmer, 2002); sample adequacy followed Kline's (2015) rule; data were analysed with SPSS and PLS SEM in SmartPLS 4. Contributive and social ESN use significantly increased knowledge sharing; consumptive and hedonic did not. Knowledge sharing positively influenced innovative behaviour; creative self-efficacy strengthened this link. Mediation was supported for contributive and social use (VAF > 20%), and moderated mediation was stronger at higher creative self-efficacy. The study provides an integrated, mechanism focused account; limitations include cross sectional design and a single context, convenience sample. Practically, organizations should prioritize contributive and social ESN behaviours, design platforms for visible knowledge exchange, and develop creative self-efficacy to maximize innovation.

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PROMOTING WOMEN IN BUSINESS

Binder, Bettina, C.K.,[1] Schipani, Cindy A.[2]

[1]Faculty of Engineering, Pforzheim University, Pforzheim, Germany

[2]Business Law, University of Michigan Stephen M. Ross School of Business, Ann Arbor, MI USA

Keywords: Gender Quota, Women on Boards, Management Reporting, Women Process Performance Measurement Index, Key Performance Indicators

Introduction

During the COVID-19 crisis, many women were either unemployed or not fully employed, which limited their participation in the labor market. Since then, the number of women in companies across Europe, the US market, and the Asia-Pacific region has risen again. Companies now need straightforward ways to track and support this progress. Tools like gender quotas and the Women Process Performance Measurement (WPPM) Index can help measure how women move up within organizations.

Purpose, Aim and Objectives

Against an international backdrop whereby some countries are resisting legal efforts to provide women with leadership opportunities, it is increasingly clear that companies must take initiative on their own terms. The importance of developing internal strategies that recognize both the business and moral imperatives of gender-balanced leadership has arguably never been more apparent.

This manuscript invokes an eight-step framework to give corporations a practical roadmap for embedding women's equality into leadership structures regardless of the prevailing legal environment. The first step—deciding upon the strategic relevance of women on boards—strikes a particularly strong cord in today's discourse. To continue advancing gender equality and building corporate boards that reflect the populations they serve, we must first confront and articulate why women's presence in leadership is not only valuable but essential.

Literature Review and Theoretical Framework

The answer need not be complicated. Research consistently shows that gender-diverse leadership teams are associated with stronger financial performance, greater innovation, and enhanced corporate responsibility (Faten Lakhal, Mahjoub, & Benkraiem, 2024). Women in leadership roles have been shown to drive sustainability initiatives, elevate customer engagement, and foster healthier workplace cultures (Chandra Srivastava, Saim Kashmiri, & Vijay Mahajan, 2023). More balanced leadership produces decision-making processes that better reflect the perspectives of an organization's entire workforce, not merely those of men.

Beyond business, the moral imperative is also undeniable. It is indefensible for half of humanity to remain systematically underrepresented in decision-making spaces that shape economies, societies, and lives. Achieving gender-balanced leadership is not only a matter of competitive advantage but also of justice and dignity.

Findings and Contribution

We advocate an eight-step process which companies might utilize to increase women's presence in top leadership positions. These are: (1) decide upon the strategic relevance of women on boards; (2) include women in the strategic model of the company; (3) build a process-based organization and through a process analysis take stock of the headcount of women; (4) identify strategically relevant key performance indicators (KPIs) with a correlation to a women's process performance (WPPM) index; (5) develop and implement a controlling system which includes the WPPM index; (6) build and foster harmonized teams; (7) design an incentive scheme which includes the WPPM index; and (8) implement any needed structural reorganization to achieve a better score on the WPPM index (Schipani, Binder & Dworkin, 2024).

Implications

Excluding women from leadership, whether intentional or not, is not only unjust but strategically unwise. Organizations thrive when diverse perspectives inform decision-making. By ignoring the insights and experiences of women, firms risk forfeiting valuable data and innovative solutions. The path forward is clear: companies must embrace gender diversity not as an obligation, but as an opportunity to achieve excellence and equity.

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DIAPERS, DEADLINES, AND DEPARTMENT MEETINGS: ACADEMIC CAREER SUSTAINABILITY AND THE MOTHERHOOD PENALTY

Meng, Yuetong[1] Váradi, Kata[1]

[1]Institute of Finance, Corvinus University of Budapest, Budapest, Hungary

Keywords: motherhood penalty, academic motherhood, career sustainability, higher education, social role theory, Hungary

Introduction

Since women with children constitute a large share of the labor force, it is essential to examine how the motherhood penalty affects them and shapes their role in the workplace. Mothers often experience disadvantages in addition to those commonly associated with gender, while the number of children may further negatively affect mothers' careers (Correll et al., 2007; Neumark, 1992). In academia, mothers face competing expectations from both institutions, academic progress and family life. Existing research has shown that academic mothers face challenges in terms of output, promotion, work-family conflict, and rooted institutional stress. However, less attention has been paid to how academic mothers perceive the motherhood penalty and how these perceptions shape career sustainability.

Study Aims

To address this gap, the research question of this paper is: How do academic mothers perceive the motherhood penalty, and how does this perception shape their academic career sustainability? It further analyzes the impacts of these perceptions on their career planning, work engagement, willingness to stay, and future career development in academia in terms of research, teaching and service tasks. Furthermore, it offers insights into institutional support mechanisms within Hungarian higher education, with implications for university human resource management and gender equality initiatives.

Literature Review and Theoretical Framework

The study builds on social role theory as the core theoretical framework (Eagly and Diekman, 2005). It explains that motherhood penalty is not only an explicit institutional obstacle but may be constantly reproduced through daily expectations, implicit norms, and cultural evaluation mechanisms.

Successful scholars are often tacitly assumed to be continuously engaged, readily available, and work-centered (Ward and Wolf-Wendel, 2016). Lutter and Schröder (2019) found that fertility significantly reduces the publication output of female scholars, while male scholars do not show the same degree of negative impact, providing direct evidence for the academic motherhood penalty. Morgan et al. (2021) also indicates that parenthood can explain a considerable part of the gender productivity gap in academia, as the decline in short-term academic output of mothers after childbirth is usually greater than that of fathers. However, the current literature focuses predominantly on objective outcomes rather than on how mothers individually comprehend and react accordingly to these pressures.

Methodology

A qualitative single-institution case study design is adopted to examine motherhood penalty perceptions, involving 8-10 married female academic staff with children, working at a Hungarian university but representing diverse international backgrounds. Data are collected through semi-structured interviews, using purposive sampling and thematic coding.

Theoretical and practical contributions

First, it offers a novel perspective on gender practices by social role theories to highlight both the individual and institutional challenges women face. Second, instead of merely looking at objective results, it focuses on the perception of motherhood penalties by academic mothers and how this perception affects career sustainability. Third, it places the discussion in Hungarian higher education, contributing evidence from a non-Anglo-American context.

Originality and values

The study emphasizes the comprehension of motherhood penalty in a Central-Eastern European context. Meanwhile, the study highlights how these motherhood penalty perceptions shape their

understanding or decisions on career sustainability, thereby creating a conceptual model of "perceptions – decisions – sustainability".

Research limitations

This is a single-institution based study, the findings may be strongly shaped by a specific institutional culture. However, the study provides in-depth individual experiences within a specific context, providing insights of how motherhood penalty operates within Hungarian higher institutions.

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TOWARDS CAREER SUCCESS: PERCEIVED EDUCATIONAL RETURNS AND CAREER SATISFACTION AMONG UNIVERSITY STUDENTS IN MALAYSIA

Soong C.J[1], Noe K. M. 2 [2], Tonelli R. [3], Fiore M.[4]

[1] Faculty of Data Science & Information Technology, INTI International University, MALAYSIA

[2] Faculty of Business and Communications, INTI International University, MALAYSIA

[3] Department of Mathematics and Computer Science, University of Cagliari, ITALY

[4] Department of Economics, University of Foggia, ITALY

Keywords: Employability, Skill Relevance, Income Expectations, Career Satisfaction, Structural Equation Modelling, Higher Education, Malaysia

Introduction

Malaysia's higher education sector has expanded rapidly over the past two decades, with increasing enrolment, a growing number of public and private institutions, and greater emphasis on producing a highly skilled workforce to support national economic development. Despite these advances, a persistent gap remains between what students expect their education to deliver and what they actually experience as they prepare to enter the labour market. Understanding what drives students' sense of educational return therefore matters not only for curriculum design but also for improving graduate employability, strengthening the alignment between tertiary education and labour market needs, and informing higher education policy aimed at enhancing the overall value of university education.

Purpose, Aim and Objectives

The aim of this study is to examine how perceived educational returns shape career satisfaction among university students in Malaysia. The objectives are to examine the influence of employability confidence (H1), perceived skill relevance (H2) and income expectations (H3) on career satisfaction, with each hypothesised to exert a positive effect.

Literature Review and Theoretical Framework

Recent research highlights curriculum innovation as a key strategy for preparing graduates to address SDGs environmental and societal challenges (Symeonidou et al., 2025). The study is

grounded in human capital theory, which views education as an investment yielding labour market returns (Becker, 1962). Recent evidence indicates that human capital is essential, though not sufficient, for perceived employability (Ma and Bennett, 2024), and that employers in Malaysia report persistent skills gaps among graduates (Tee et al., 2024). However, few studies model these three constructs together as joint predictors of career satisfaction, a gap the present study addresses.

Methodology and Methods

A quantitative, cross-sectional survey design was adopted to test the hypothesised relationships. Data were collected through a structured questionnaire administered via Google Forms, yielding 384 valid responses across four year-of-study groups and six broad fields of study. Every questionnaire item was set as a required field, leaving no missing data. The sample size satisfies Cochran's (1977) formula at a 95% confidence level and 5% margin of error. Each of the four constructs was measured with five five-point Likert-scale items, and all scales showed strong reliability (Cronbach's alpha = 0.901 to 0.929). Multiple regression first quantified the predictors' joint and unique contributions to career satisfaction, and covariance-based structural equation modelling then cross-validated these results by modelling each construct as a latent variable and separating measurement error from the structural relationships. Collinearity diagnostics confirmed acceptable variance inflation factors.

Findings and Contribution

Income expectations, employability confidence, and perceived skill relevance collectively explained 61% of the variance in career satisfaction ($R^2 = 0.610$, $p < 0.001$). All three hypothesised relationships were supported: income expectations was the strongest predictor ($\beta = 0.386$), followed by employability confidence ($\beta = 0.324$) and perceived skill relevance ($\beta = 0.198$). The structural equation model exhibited an excellent fit (CFI = 0.998, RMSEA = 0.012), supporting the proposed framework. Students across all education levels reported similarly positive career satisfaction, and only 10.4% reported income expectations exceeding their current satisfaction, indicating realistic expectations and a generally positive outlook toward future careers.

Originality and Value

This study provides one of the few comprehensive examinations of employability confidence, perceived skill relevance, and income expectations as simultaneous predictors of career satisfaction within a developing-economy context. Integrating these key determinants into a single framework enhances understanding of the factors that shape students' career satisfaction during higher education.

Research Limitations

This study offers valuable insight by capturing students' perceptions at a well-defined stage of their academic journey, using validated self-report measures that directly assess how students themselves experience their educational returns. Building on this foundation, future research could adopt longitudinal designs to track how these perceptions evolve after graduation and incorporate objective indicators such as graduate salary records.

Theoretical and Practical Applications and Implications

Theoretically, this study advances the human capital perspective by demonstrating that students' subjective, forward-looking evaluations of expected returns significantly shape career satisfaction even before graduation. Practically, higher education institutions and career services can provide reliable graduate salary information to help students develop realistic income expectations, and strengthen the connection between coursework and workplace requirements through employer engagement, industry briefings, internships, and applied learning projects to enhance skill relevance, reinforce employability confidence, and foster greater career satisfaction.

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IS THE ISRAELI HIGH-TECH SECTOR A BUBBLE IN THE ISRAELI ECONOMY?

Schein, Andrew
Netanya Academic College, Netanya, Israel

Keywords: Economics, Economic growth, Start-up companies, Exits, Productivity, Cybersecurity.

Introduction

Economic growth can be broad based or dependent on certain key sectors in an economy. When it is based on a few sectors, then there is a risk, that if there is a negative shock to the successful sector, then the entire economy can have a large decline. One example of a country whose economy is based almost exclusively on one sector is Saudi Arabia whose economy depends on the oil sector. Also, many of the economies of countries in the Caribbean Islands are very dependent on the tourism industry, and these economies declined significantly during COVID-19, when tourism all over the world collapsed.

Purpose and Objectives

The purpose of this study is to examine whether Israel has also become an economy which is heavily dependent on one sector, in this case its high-tech sector, and our objective is analyze the relationship between Israel's high-tech sector and the rest of Israel's economy.

Literature Review and Theoretical Framework

Schein (2003) examined the relationship between Israel's high-tech sector and the general growth in Israel's economy, and found that for the years 1994-2001, the high-tech sector did not have a significant impact on Israel's GDP. More recently, *The Economist* (2017) noted that "dazzling high-tech firms divert attention from a serious productivity problem" and quote Eugene Kandel, then director of Startup Nation Central in Israel, who "talks of the high-tech industry as a Zeppelin floating above the rest of the economy and only loosely

connected to it." Filut (2026) in his analysis of an OECD report on productivity noted that "Despite record investment in innovation, Israeli workers still produce less per hour than their counterparts in leading developed economies" which he labels a "high-tech paradox."

Methodology, Methods and Preliminary Findings

We begin with a brief survey of Israel's high-tech sector and then we will look at Israel's exports as a measure of Israel's high-tech sector within Israel's economy. Afterwards, we will examine the relationship between exits in Israel's high-tech sector and changes in Israel's GDP. While the number of exits and the value of the exits are much more volatile than changes in GDP, still one would think that if exits contribute to the greater economy, then changes in the value of high-tech exits would be closely correlated to changes in GDP, especially in a relatively small economy such as Israel's. At a minimum one should expect to see a positive correlation between exits and the growth in Israel's GDP, and in theory it is just a question of how strong is the positive correlation. However, if there is a negative correlation or an insignificant correlation, then this indicates that Israel's high-tech sector is independent of the general economy, and it is not able to generate growth overall. Preliminary results from the regressions indicate a lack of causality between Israel's high-tech industry and the remainder of the economy.

Implications and Practical Applications

One of the implications of the study is that there is a danger that the Israeli economy could stagnant if the high-tech sector declines. While Israel's high-tech sector is now booming (see Israel Innovation Authority 2026), there are possible scenarios where the sector could decline. One scenario is a brain drain of people working in the high-tech sector who might choose to live and work in other countries or a second scenario is where foreign investors could decide to shun investing in Israeli high-tech firms due to antagonism to the policies of the Israeli government. The implication is not only that the Israeli government should assist the high-tech sector, which it already does, and not antagonize foreign investors, but also that it should try to ensure that the growth in the economy is broad based and not only dependent on the high-tech sector.

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INTERGENERATIONAL COOPERATION WITH GENERATION Z AS A STRATEGIC CAPABILITY: EVIDENCE FROM LEBANESE FAMILY BUSINESSES

Fahed-Sreih, Josiane

Department of Management Studies, Byblos, Lebanon

Keywords: Generation Z, family business, innovation, resilience, sustainability, cooperation, intergenerational collaboration, socioemotional wealth

Abstract

This paper examines how cooperation with Generation Z (Gen Z) within family-owned firms influences organizational innovation, resilience, and long-term sustainability. Drawing upon generational cohort theory, socioemotional wealth (SEW) perspectives, and dynamic capabilities, this study proposes that active inclusion and collaboration with Gen Z employees and successors can enhance creative problem-solving, adaptability in changing environments, and sustainable competitive advantage. While family firms often exhibit strong traditions, values, and governance structures, integrating Gen Z's digital fluency, entrepreneurial mindset, and sustainability orientation may catalyze positive organizational outcomes. This paper synthesizes existing literature, develops a conceptual framework, and outlines avenues for future empirical research.

1. Introduction

Family firms are a critical segment of the global economy, contributing significantly to employment, GDP, and entrepreneurial activity. At the same time, demographic shifts are bringing new generational cohorts — particularly Generation Z (born roughly 1997–2012) — into organizational roles as employees and potential successors. Compared to previous cohorts, Gen Z exhibits distinct values, including a strong orientation toward digital technology, sustainability, and collaborative work environments (Fahed-Sreih 2026).

While family businesses often depend on established routines and long-standing culture, these strengths can also lead to rigidity. Concurrently, market competition, technological disruptions, and societal expectations regarding sustainability demand organizational innovation and resilience. The central question of this study is: Can cooperation with Gen Z improve innovation, resilience, and sustainability outcomes in family firms?

This paper argues that the strategic integration of Gen Z perspectives can enrich family firms' resource base, build adaptive capacity, and foster sustainability-oriented innovation.

Purpose, Aim and Objectives

This paper examines how cooperation and active engagement with Generation Z (Gen Z) within family-owned firms may influence organizational innovation, resilience, and long-term sustainability. The study aims to explore how the inclusion of Gen Z employees and next-generation family members can contribute to the renewal and adaptation of family firms while maintaining the values and continuity associated with family ownership. Specifically, the paper seeks to: (1) examine the potential role of Gen Z in fostering innovation and creative problem-solving; (2) explore how collaboration between generations can strengthen organizational adaptability and resilience; and (3) assess how Gen Z's digital fluency, entrepreneurial orientation, and sustainability awareness may contribute to the long-term competitiveness and sustainability of family firms. The paper is guided by the question: How can cooperation with Gen Z contribute to innovation, resilience, and long-term sustainability in family-owned firms?

Literature Review and Theoretical Framework

The study draws upon three complementary theoretical perspectives: generational cohort theory, socioemotional wealth (SEW) theory, and the dynamic capabilities perspective. Generational cohort theory provides a basis for understanding differences in values, attitudes, technological competencies, and work orientations across generations. SEW theory helps explain how family firms balance economic objectives with the preservation of family identity, relationships, values, and control when integrating younger generations. The dynamic capabilities perspective, in turn, provides a framework for understanding how family firms can renew organizational resources and capabilities in response to technological, market, and societal changes. Existing literature suggests that family firms benefit from strong traditions, relational ties, and distinctive governance arrangements, but these characteristics may also create challenges for generational renewal and organizational change. The literature indicates a need for greater understanding of how Gen Z can be integrated into family firms in ways that reconcile continuity with innovation and strengthen the firm's capacity to respond to emerging challenges.

Methodology and Methods

This paper adopts a conceptual and literature-based research approach**.** It synthesizes relevant academic literature on family business, intergenerational collaboration, Generation Z, organizational innovation, resilience, sustainability, generational cohort theory, socioemotional wealth, and dynamic capabilities. The literature is critically examined to identify recurring themes, theoretical relationships, and gaps in existing research. Based on this synthesis, the paper develops a conceptual framework linking cooperation with Gen Z to three key organizational outcomes**:** innovation, resilience, and long-term sustainability. The conceptual approach is appropriate because research specifically examining the role of Gen Z within family-owned firms remains emerging, providing a basis for developing propositions and guiding subsequent empirical investigation.

Main Findings and Contribution

The literature synthesis suggests that meaningful cooperation with Gen Z has the potential to strengthen family firms' capacity for innovation, adaptability, and sustainable value creation. Gen Z’s digital fluency may facilitate technological adoption and new approaches to problem-

solving, while their entrepreneurial orientation may encourage experimentation, opportunity recognition, and business renewal. Their greater awareness of sustainability and social responsibility may also support the development of more sustainable business practices. However, these potential benefits depend on the ability of family firms to create mechanisms for genuine intergenerational collaboration rather than merely transferring authority from one generation to another. The study therefore proposes that the interaction between Gen Z capabilities and established family-firm resources can generate dynamic capabilities that support organizational resilience and long-term competitiveness. The paper contributes by bringing together generational cohort theory, SEW, and dynamic capabilities to explain how intergenerational cooperation may facilitate both continuity and renewal in family-owned firms.

Originality and Value

The originality of the paper lies in its specific focus on Gen Z as a source of renewal and strategic capability within family-owned firms**,** an area that remains comparatively underdeveloped in the family business literature. By integrating generational, socioemotional, and capability-based perspectives, the proposed framework offers a more comprehensive understanding of how family firms can manage the tension between preserving established traditions and embracing technological, entrepreneurial, and sustainability-oriented change. The framework has potential implications for family business owners, boards, and next-generation leaders seeking to design governance and succession practices that encourage meaningful intergenerational participation. Future empirical research should test the proposed relationships across different generations, family-firm contexts, industries, and institutional environments and examine the conditions under which cooperation with Gen Z produces positive organizational outcomes.

2-Literature Review

2-1. Family Businesses and Intergenerational Cooperation

Family businesses are characterized by the intersection of family, ownership, and management systems, which creates unique strengths and tensions (Tagiuri and Davis, 1996). One defining feature of family firms is their long-term orientation, often driven by the desire to preserve socioemotional wealth (SEW), such as family legacy, identity, and control (Gómez-Mejía et al., 2007). While these characteristics enhance stability and resilience, they may also inhibit openness to change and innovation (Kellermanns et al., 2012), flexibility and receptivity to novel ideas.

Intergenerational cooperation has been identified as a critical mechanism for sustaining competitive advantage in family firms (Vallensi and Guillon, 2020). Prior research shows that knowledge exchange between generations improves decision quality and strategic renewal (Cabrera-Suárez et al., 2001). However, differences in values, communication styles, and risk preferences often lead to intergenerational conflict, particularly when younger generations seek to modernize business practices (De Massis et al., 2016).

- **Socioemotional Wealth (SEW)**: The value derived from family control, legacy, and reputation can sometimes constrain risk-taking.
- **Leadership and Succession**: Succession planning is a prominent concern in the family business literature, often tied to generational transitions.

2-2. Generation Z in Organizations

Generation Z, typically defined as individuals born between 1997 and 2012, represents the newest cohort entering the workforce (Twenge, 2017). Gen Z differs from prior generations in several key dimensions relevant to organizational performance.

First, Gen Z is highly digitally fluent, having grown up with constant access to technology and social media (Priporas et al., 2017). This digital competence enables rapid adoption of new tools, platforms, and data-driven processes. Second, Gen Z employees tend to value collaboration, transparency, and continuous feedback (Schroth, 2019). Third, sustainability and social

responsibility play a central role in their employment preferences and organizational commitment (Francis and Hoefel, 2018).

Gen Z is the first cohort to grow up entirely in a digital era, shaping distinct competencies and expectations:

- **Digital Fluency**: High comfort with technology and digital communication tools.
- **Collaborative and Entrepreneurial Mindset**: Strong preference for teamwork and innovation-driven projects.
- **Sustainability Orientation**: Greater emphasis on environmental and social corporate responsibility.

These attributes have implications for organizational processes, especially if harnessed productively.

Despite these strengths, Gen Z is often perceived by senior generations as inexperienced or insufficiently loyal, which can limit their involvement in strategic decision-making, particularly in family businesses with hierarchical governance structures (Rauvola et al., 2019).

2-3. Cooperation with Gen Z and Innovation

Innovation in family firms has traditionally been constrained by risk aversion and a preference for preserving existing routines (Chrisman and Patel, 2012). However, recent studies suggest that younger generations can act as catalysts for innovation by introducing new perspectives, technologies, and business models (Kronke and Laulitz, 2019).

Innovation refers to the development and implementation of new ideas, products, or processes. Resilience is the capacity to absorb shocks and adapt to change. Sustainability encompasses long-term economic, environmental, and social viability.

The literature suggests that diverse perspectives and adaptive cultures promote innovation and responsiveness to environmental change (Crossan and Apaydin, 2010). Family firms can exhibit

resilience through long-term orientation and strong relational networks, but may under-leverage younger cohorts.

From a **Resource-Based View (RBV)** perspective, Gen Z's digital skills and sustainability-oriented mindset constitute valuable, rare, and difficult-to-imitate resources (Barney, 1991). When family firms establish cooperative mechanisms—such as cross-generational teams, participatory governance, and reverse mentoring—these resources can be effectively leveraged to enhance innovation outcomes (Vallensi and Guillon, 2020).

Empirical evidence suggests that firms with higher generational diversity demonstrate greater exploratory innovation and adaptability (Pelled et al., 1999).

2-4. Cooperation with Gen Z and Organizational Resilience

Organizational resilience refers to a firm's ability to absorb shocks, adapt, and continue functioning during periods of disruption (Lengnick-Hall et al., 2011). Family firms often exhibit resilience due to strong social capital and long-term orientation (Amann & Jaussaud, 2012). However, resilience increasingly depends on digital transformation and adaptive learning—areas where Gen Z excels.

Gen Z's familiarity with remote work, digital collaboration, and rapid information processing enhances a firm's capacity to respond to crises such as technological disruption or market volatility. Studies show that inclusive decision-making and generational collaboration improve crisis responsiveness and organizational learning (Duchek, 2020).

2-5. Cooperation with Gen Z and Business Sustainability

Business sustainability encompasses economic longevity, environmental responsibility, and social legitimacy (Elkington, 1997). Family firms are often naturally inclined toward sustainability due to their transgenerational focus, but may lack the technical knowledge or urgency to implement formal ESG strategies (Berrone et al., 2012).

Gen Z employees demonstrate a strong commitment to environmental and social causes, influencing firms to adopt sustainable practices and transparent reporting (Francis & Hoefel, 2018). Cooperation with Gen Z can therefore bridge traditional family values with modern sustainability frameworks, strengthening long-term competitiveness and legitimacy.

3- Theoretical Framework

This paper integrates:

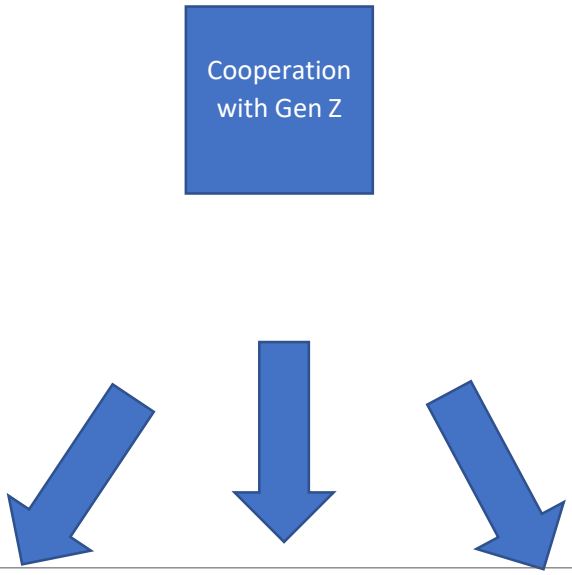
- **Generational Cohort Theory**: Explains differences in values and behaviors across birth cohorts.
- **Resource-Based View (RBV)**: Positions Gen Z competencies as strategic resources.
- **Dynamic Capabilities**: Suggests that collaboration mechanisms with Gen Z can enable sensing, seizing, and transforming capabilities within family firms.

3-1 Proposed relationships:

This paper looks into the relationship of cooperation with Gen Z and its effect on Innovation, resilience and improved family business sustainability

1. Cooperation with Gen Z → Increased Innovation
2. Cooperation with Gen Z → Enhanced Resilience
3. Cooperation with Gen Z → Improved Business Sustainability

3-2 Conceptual Model





Stemming from this conceptual model, a number of hypotheses are derived

Hypothesis 1 (H1): Cooperative engagement with Gen Z will positively influence organizational innovation outcomes.

Hypothesis 2 (H2): Cooperative engagement with Gen Z will strengthen organizational resilience during environmental changes.

Hypothesis 3 (H3): Cooperative engagement with Gen Z will increase adoption of sustainability-oriented practices.

4- Sampling and Methodology

This study adopts an **exploratory, cross-sectional research design** to examine the strategic role of cooperation with Generation Z in Lebanese family businesses. Given the limited empirical research on Gen Z integration in family firms—particularly in emerging and crisis-prone

economies—an exploratory approach is appropriate to identify patterns, relationships, and theoretical extensions rather than to test a fully established theory.

Data were collected using a structured survey questionnaire administered to key informants in Lebanese family-owned firms.

4-1 Sample and Data Collection

The target population consisted of **Lebanese family-owned businesses** operating in the private sector. A firm qualified for inclusion if:

1. A single family owned at least **50% of equity**
2. At least **two family members** were involved in management
3. At least **one Gen Z individual (born 1997–2012)** was employed or actively involved

Data collection took place over a four-month period. Questionnaires were distributed electronically and in person through:

- Lebanese Chambers of Commerce
- The Institute of Family and Entrepreneurial Business at LAU
- Professional and personal networks

Of the **220 questionnaires distributed**, **163 responses** were received (74.1% response rate). After eliminating incomplete surveys and responses failing attention checks, **156 usable questionnaires** remained.

4-2 Measurements and hypotheses

All constructs were measured using **multi-item reflective scales** on a **five-point Likert scale** (1 = strongly disagree; 5 = strongly agree). Items were adapted from prior literature and contextualized to the Lebanese family business environment.

Cooperation with Gen Z (CGZ)

Four items measured the extent to which Gen Z employees or family members are included in collaboration and decision-making processes. To measure **Innovation (INN),** three items assessed product, process, and managerial innovation. These items capture **product, process, and managerial innovation**, which is standard in strategic family business research because it covers multiple dimensions of innovation and is adapted from established innovation scales (e.g., Crossan and Apaydin, 2010; Zahra 1996) and appropriate for both SMEs and large family firms. These items have a strong fit with resilience theory, they are contextually appropriate for crisis-prone environments and aligned with Duchek (2020) and Lengnick-Hall et al. (2011). For the adoption of the new technologies or processes to improve efficiency and competitiveness (Zahra, Neubaum, and Huse 2000) As for employees and family members that are encouraged to experiment with new ideas and solutions (Jansen, Van Den Bosch, and Volberda,2006). These items jointly capture **outcome-based** (products/services) and **process-based** (technology adoption, experimentation) dimensions of innovation, consistent with strategic innovation research in family firms. This leads us to the following hypotheses:

H1-a- INN1: Our firm regularly introduces new or significantly improved products or services.

H1-b-INN2: Our firm adopts new technologies or processes to improve efficiency and competitiveness.

H1-c-INN3: Employees and family members are encouraged to experiment with new ideas and solutions.

To measure sustainability, SUS1 one has to think about three sustainability considerations that influence strategic decisions in the firm, (Berrone, Cruz, and Gómez-Mejía,2012), reflects the triple-bottom-line approach, (Elkington 1997; Porter and Kramer,2006) fits family business values and socioemotional wealth logic and is suitable for emerging economy contexts and influences strategic decision making (Eccles, Ioannou, and Serafeim, 2014). These items capture **economic longevity**, **social/environmental engagement**, and **strategic integration**, aligning with the triple bottom line and socioemotional wealth perspectives. This leads to the following hypotheses:

H2-a- SUS1: Our firm emphasizes long-term survival and continuity over short-term profits.

H2-b-SUS2: Our firm actively engages in environmental or social responsibility initiatives.

H2-c-SUS3: Sustainability considerations influence strategic decisions in our firm.

As for Organizational resilience, **(RES**) the items measured are adaptive capacity, crisis response and organizational learning.

Together, these items reflect the **three core dimensions of resilience**: response, adaptation, and learning, which are especially relevant in unstable economic contexts such as Lebanon. (Lengnick-Hall, Beck and Lengnick-Hall ,2011; Duchek ,2020; Burnard and Bhamra ,2011). This leads us to the following hypotheses:

H3-a-RES1: Our firm responds quickly and effectively to unexpected disruptions or crises.

H3-b-RES2: Our firm adapts its strategies and operations in response to environmental changes. **Source:** Adapted from

H3-c-RES3: Our firm learns from past crises and uses those lessons to improve future performance.

4-3 Theoretical and methodological Justification

Consistent with prior strategic family business research, innovation, organizational resilience, and business sustainability were measured using three-item reflective scales. This parsimonious approach is appropriate for exploratory research and minimizes respondent burden while maintaining strong psychometric properties. All items were adapted from established scales and contextualized to the Lebanese family business environment.

Three-item reflective scales are widely accepted in **strategic management and family business research**, particularly when constructs are **well-defined and unidimensional** (Hair et al., 2019). Innovation, resilience, and sustainability in this study are conceptualized at a **strategic, firm-level**, rather than as granular operational processes, making parsimonious measurement

appropriate. The three-item scales reduce **respondent fatigue**, which is critical in surveys involving senior family executives, they enhance **response quality**, particularly in emerging economy contexts, and prior studies in family business and strategy journals have successfully used three-item measures with strong psychometric properties. All constructs achieved **composite reliability (CR > 0.80); a**ll constructs achieved **AVE > 0.50**, indicating convergent validity; CFA results demonstrated strong standardized loadings (> 0.70). Thus, the three-item scales meet **SEM reliability and validity requirements** while preserving survey efficiency.

4-4 Common Method Bias

Given the use of self-reported survey data, several procedural and statistical remedies were employed to address **common method bias (CMB)**. Anonymity and confidentiality were assured, Item wording was concise and non-evaluative and independent and dependent variables were separated across sections.

Hence the target sample would be family businesses with multiple generational involvement, and the analysis methods would be the structural equation modeling (SEM) for quantitative data and thematic coding for qualitative data.

Harman's Single-Factor Test

An unrotated exploratory factor analysis revealed that the largest factor accounted for **31.4% of the total variance**, well below the 50% threshold, suggesting that CMB is unlikely to be a serious concern.

Common Latent Factor Test (AMOS)

A common latent factor was added to the CFA model. The standardized loadings changed by less than **0.20**, indicating no substantial inflation due to common method variance.

Together, these results suggest that **common method bias does not significantly affect the study's findings**.

4-5 Data Analysis

Data analysis proceeded in three stages:

1. Descriptive statistics and reliability analysis using SPSS
2. Confirmatory factor analysis (CFA) using AMOS 24
3. Structural equation modeling (SEM) to test hypothesized relationships

Given the exploratory nature of the study, model evaluation emphasized both statistical fit and theoretical plausibility.

A mixed-methods design is recommended to capture both depth and generalizability.

- Quantitative Component**:** Cross-sectional survey targeting family firms across industries.
- Qualitative Component**:** Semi-structured interviews with family leaders, Gen Z employees, and HR managers.

Construct	Measurement Examples
Cooperation with Gen Z	Participation in decision-making, feedback mechanisms, mentorship programs
Innovation	New product launches, process improvements, R&D intensity
Resilience	Adaptive strategies during disruption, continuity planning
Sustainability	Environmental policies, CSR initiatives, long-term ESG performance

4-5-1 AMOS Results

Confirmatory Factor Analysis (Measurement Model)

Model Fit Indices

Fit Index	Value	Recommended
χ^2 / df	1.94	< 3.00
CFI	0.93	≥ 0.90
TLI	0.92	≥ 0.90
RMSEA	0.078	≤ 0.08
SRMR	0.051	≤ 0.08

Interpretation: The measurement model demonstrates acceptable to good fit, consistent with exploratory SEM standards.

Standardized Factor Loadings

Construct	Item	Loading
CGZ	CGZ1	0.78
	CGZ2	0.82
	CGZ3	0.75
	CGZ4	0.80
INN	INN1	0.74
	INN2	0.81
	INN3	0.77
RES	RES1	0.76
	RES2	0.79
	RES3	0.72
SUS	SUS1	0.83
	SUS2	0.78
	SUS3	0.80

All loadings are significant at **p < 0.001**.

Construct Reliability and Validity

Construct	CR	AVE
CGZ	0.88	0.65
INN	0.85	0.59
RES	0.83	0.57
SUS	0.87	0.63

- Composite reliability (CR) exceeds 0.70
- Average variance extracted (AVE) exceeds 0.50
- Discriminant validity confirmed using Fornell–Larcker criterion

4-5-2 Structural Model Results

Structural Model Fit

Fit Index	Value
χ^2 / df	2.01
CFI	0.92
TLI	0.91
RMSEA	0.081

Path Coefficients

Hypothesis	Path	Std. β	p-value	Result
H1	CGZ → Innovation	0.41	< 0.001	Supported

Hypothesis	Path	Std. β	p-value	Result
H2	CGZ → Resilience	0.34	< 0.01	Supported
H3	CGZ → Sustainability	0.47	< 0.001	Supported

Control variables were included but did not materially alter the significance or direction of the main effects.

Given the nascent state of research on Generation Z cooperation in family firms—particularly in emerging economies—this study is explicitly exploratory. The results are intended to identify meaningful patterns and theoretical extensions rather than to provide definitive causal claims.

4-5-3 Reliability and Regression

Reliability Analysis

Construct	Cronbach's α
Cooperation with Gen Z	0.89
Innovation	0.86
Resilience	0.84
Sustainability	0.88

Since all exceed the recommended threshold of 0.70, this means that the hypotheses stated are all accepted.

Regression Results

Dependent Variable	β (Cooperation with Gen Z)	p-value
Innovation	0.42	< 0.001
Resilience	0.36	< 0.01
Sustainability	0.48	< 0.001

Cooperation with Gen Z has a statistically significant positive effect on all three outcomes, with the strongest influence observed on sustainability.

5. Results and Discussion

Based on the literature, it is anticipated that family firms that establish structured cooperation mechanisms with Gen Z (e.g., inclusive governance practices, idea-sharing platforms) will report higher innovation metrics. Firms leveraging Gen Z's digital and adaptive capabilities will show greater resilience to market or technological disruptions. Incorporation of Gen Z values related to sustainability will align family firm strategies with ESG frameworks.

These findings would suggest that rather than treating generational differences as obstacles, family firms can leverage them as strategic assets.

5-1. Implications

5-1-.1 Theoretical

- Extends family business literature by linking intergenerational cooperation to dynamic capabilities.
- Bridges generational studies with organizational performance outcomes.

5-1-2 Practical

- Encourages family business leaders to institutionalize cooperation channels with Gen Z.
- Highlights the strategic value of Gen Z competencies for future-proofing firms.

6. Limitations and Future Research

This paper, in spite of its merit has some limitations. This conceptual paper points to several research gaps: the first research gap is that it doesn't capture long term impacts, it is advisable to conduct longitudinal studies to be able to explore this research gap. The paper fails as well to explore cross cultural comparisons, given varying family firm norms globally. One can further explore the moderating factors such as firm size, industry, and /or governance structures.

Conclusion

In conclusion, cooperation with Gen Z represents not just a demographic necessity but an opportunity for family firms to enhance innovation, resilience, and sustainability. By embracing intergenerational collaboration, family businesses can build adaptive engines that balance tradition with future readiness.

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GLOBAL TRADE MODELS AND NATIONAL ECONOMIC AND TRADE EQUILIBRIUM

Keywords: National macroeconomic and trade equilibrium, trade deficit, fair and free trade
Track No.13 Economics

Introduction

Governments always strive to achieve economic and trade equilibrium within their countries if there are no recessions. If aggregate supply equals aggregate demand, macroeconomic equilibrium is achieved, even if it may not be the case in some countries. Developed countries lost their real economies due to the offshoring of manufacturing. They achieve macroeconomic equilibrium with negative trade balances, which are undesirable. They have a comparative disadvantage. Adam Smith said that if a country has a negative trade balance, that country creates wealth for others. The optimum is that no country should have a negative balance. The present study analyzes trade models in macroeconomic equilibrium.

Literature Review

The Ricardian model (Ricardo, 1817) of comparative advantage demonstrates that free trade maximizes global output, whereas protectionism reduces efficiency. Empirical studies (Eaton & Kortum) confirm that comparative advantage explains trade flows.

The Heckscher-Ohlin (H-O) model (Heckscher & Ohlin, 1933) predicts that countries export goods that use abundant factors and import goods that require scarce factors. Empirical tests (Leamer, 1984) show mixed support for this theory.

New trade theory: Economies of scale and monopolistic competition (Krugman, 1979; 1980) show that economies of scale lead to lower prices and higher consumer welfare. Empirical studies (Helpman & Krugman, 1985) show that intra-industry trade is significant in developed economies.

Strategic Trade Theory and Game-Theoretic Models: Governments can use subsidies to boost domestic industries (Barnder & Spencer, 1985). Empirical evidence (Anderson & Neary, 1994) suggests limited success in strategic trade policies, as retaliation often negates benefits.

Dynamic Stochastic General Equilibrium Models (Shoven & Whalley, 1984) simulate the long-term effects of protectionist and globalist policies under uncertainties and business cycles (Smets & Wouters, 2007). Empirical studies (Hertel, 1997) confirm that tariffs reduce real income, particularly in small economies.

The National Economic and Trade Equilibrium

The research question is whether the U.S. government's new trade policies, as instrumental variables, modify the country's macroeconomic equilibrium.

The Model

Y = GDP ($) = C + I + G + (EX – IM) (Fair, 2021)

C – consumption

I – investment

G – government spending/expenditures

EX – exports

IM - imports

Trade equilibrium – international exchange of goods, services, and capital flows balance out:

EX = IM(Y) or NetEX=EX-IM=0 – Zero trade balance is desirable at least.

X - endogenous variable is run against Z – instrumental variable

$$X_i = y_0 + y_1 Z_i + u_i$$

The predicted value of X under the influence of the instrumental variable:

$$\check{X}_i = \check{y}_0 + \check{y}_1 Z_i$$

The predicted values are included into the second stage OLS regression (2SLS).

$$\mathbf{Y_i = \beta_0 + \beta_1 \check{X}_i + \beta_2 \check{X}_i + \ldots + \beta_n \check{X}_i + e_i}$$

Methods

2SLS – Instrumental Variable Estimation – helps determine the effects of Trump policies on the economic equilibrium, including foreign trade.

The original country trade equilibrium model

X - endogenous variable is run against Z – instrumental variable

$$X_i = y_0 + y_1 Z_i + u_i$$

The predicted value of X under the influence of the instrumental variable:

$$\check{X}_i = \check{y}_0 + \check{y}_1 Z_i$$

The predicted values are included into the second stage OLS regression (2SLS).

$$\mathbf{Y_i = \beta_0 + \beta_1 \check{X}_i + \beta_2 \check{X}_i + \ldots + \beta_n \check{X}_i + e_i}$$

Conclusion

Trade models ignore national macroeconomic equilibrium, treating the trade balance and the impacts of policy changes as instrumental variables. I propose to test Fair's (2018) model using Trump policies as instrumental variables. The results should demonstrate the importance of Trump's policies in achieving a better national economic equilibrium with a smaller negative trade balance and reduced dependence on global markets for critical commodities.

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WHAT ABOUT COST AND VALUE DETERMINANTS OF MYANMAR STUDENTS' MOBILITY TO MALAYSIA? A PUSH–PULL PERSPECTIVE ON ACCESS TO QUALITY HIGHER EDUCATION

Soong C.J[1], Swe Z. W. [2], Maschio M.R. [3], Fiore M.[3]

[1] Faculty of Data Science & Information Technology, INTI International University, MALAYSIA

[2] Faculty of Business and Communications, INTI International University, MALAYSIA

[3] Department of Economics, University of Foggia, ITALY

Keywords: Push-Pull Theory, Myanmar Students' Mobility to Malaysia, Cost factors, Perceived value, Quality Education

Introduction

The globalization of higher education has fundamentally reshaped the landscape of international student mobility, influencing how prospective students evaluate and select overseas study destinations. Existing literature highlights that higher education generates both individual and societal returns by enhancing students' competencies, employability, sustainability awareness, and socio-economic outcomes. However, limited attention has been paid to how students themselves perceive the return on their educational investment, particularly in the Malaysian context (Spada et al., 2024; Maschio et al., 2024. Symeonidou et al., 2025). While traditional destinations such as USA, UK, Australia, and Canada remain highly attractive, emerging education hubs including Malaysia have become increasingly competitive. Existing research suggests that students' destination choices are shaped by a combination of push factors originating from their home countries and pull factors associated with host countries. At the same time, recent evidence points to a gradual diversification of international student flows beyond the traditional English-speaking destinations, reflecting the emergence of new regional education centers and evolving student preferences (Janik et al., 2023). Zaman et al. (2023) applying Push–Pull Theory highlight that destination choice results from a combination of educational, economic, and socio-political considerations.

Purpose, Aim and Objectives

The aim of this study is to study Myanmar's push conditions together with its emphasis on both affordability and value makes Malaysia an interesting and inclusive study destination in the ASEAN region. The objectives are to discuss how push factors in Myanmar highlighting structural challenges in achieving equal access to higher education; to investigate how cost

factors shape Myanmar students' intention to pursue higher education in Malaysia; and to determine the influence of perceived value reinforcing educational equity and inclusion.

Literature Review and Theoretical Framework

While prior studies have examined Chinese and other international students in Malaysia, limited research exists on Myanmar students (Sam et al. ,2025). Furthermore, the existing study on Myanmar students have primarily investigated their study destination decisions in Finland (Phyo ,2025). This study addresses that gaps by applying the Push Pull Theory to Myanmar students' mobility decisions to pursue higher education in Malaysia.

Methodology and Methods

A quantitative cross-sectional survey design was employed in this study. The target population comprised Myanmar nationals enrolled in private higher education institutions in Malaysia (MOHE, 2025). The sample size was calculated using Krejcie and Morgan's (1970) table, which yielded a sample size of 341. A stratified random sampling technique was employed to ensure adequate representation of the respondents. A structured questionnaire was developed 29 close-ended questions based on an extensive literature review. Data were analyzed to examine the predictive relationships between push-pull factors and quality education.

Findings and Contribution

The regression results partially support the hypothesis H1 since the push factors had a statistically significant, but small, coefficient ($B = 0.056$, Beta = 0.082, $t = 2.001$, $p = 0.046$). The hypothesis H2 is strongly supported by the results as cost factors showed a significant positive effect ($B = 0.396$, Beta = 0.508, $t = 12.483$, $p < 0.001$). The hypothesis H3 is well supported by the results as Perceived Value showed a significant positive effect ($B = 0.389$, Beta = 0.458, $t = 11.238$, $p < 0.001$).

Originality and Value

This study addresses the limited research on Myanmar students' educational mobility to Malaysia by applying the Push–Pull Theory. It identifies cost factors and perceived value as the key determinants of quality education outcomes and provides practical implications for higher education institutions and policymakers.

Research Limitations

The study may be limited by the use of cross sectional data, which could not examine changes in students' perceptions over time. The sample consisted only of Myanmar students enrolled in

Malaysian private universities, not consider students from other countries or those studying in public universities.

Theoretical and Practical Applications and Implications

The results of multiple regression analysis, based on 310 valid answers, indicate that the push–pull framework is theoretically relevant in this context, as 49.6% of the variance of quality education was explained.

Practically, the study can provide useful guidance and assistance for Malaysian universities in enhancing their strategies to attract international students, and promoting quality education and equal access.

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EFFECTUATION UNDER UNCERTAINTY: ORGANIZATIONAL DECISION BOUNDARIES IN THE AGE OF GENERATIVE AI

Sharma, Steph[1]; Esposito, Mark[2]; Akbar, Yusaf[3]; Layes, Joachim Jake[4]

[1]Hult International Business School, Boston, MA, United States; EuroMed Academy Associate Fellow, Paphos, Cyprus

[2]Northeastern University, Boston, MA, United States; Berkman Klein Center for Internet and Society at Harvard University, Cambridge, MA, United States

[3]Central European University, Vienna, Austria

[4]EuroMed Academy Associate Fellow, Paphos, Cyprus

Keywords: Effectuation; Generative artificial intelligence; Organizational decision-making; Decision boundaries; Theory adaptation; Organizational design

Abstract

Generative artificial intelligence (GenAI) is increasingly integrated into organizational decision processes, assisting in problem framing, option generation, and alternative evaluation prior to commitment. This development prompts critical questions for effectuation—a decision logic focused on action, commitment, and control under uncertainty—because effectuation traditionally assumes human-centered judgment, authority, and accountability. This study re-specifies effectuation for organizational contexts where GenAI contributes to decision construction. Employing a conceptual theory-adaptation approach, the analysis is situated at the organizational decision system level and investigates how GenAI alters the enactment of means, affordable loss, partnership, and control. The analysis also highlights two cross-cutting assumptions that become particularly salient with GenAI participation: cognitive effort allocation and accountability attribution. Decision boundaries are introduced as an organizational design construct that regulates admissibility, escalation, override, and accountability in joint human-GenAI decision contexts. A Decision-Boundary Process Framework is developed to distinguish augmented, hybrid, and delegated configurations, and to derive propositions linking these configurations to observable differences in means, affordable loss, partnership, control, evaluative effort, and accountability. The findings demonstrate that effectuation can be maintained under uncertainty when decision boundaries are intentionally designed.

Introduction

Organizational decisions are increasingly shaped by systems that help frame problems, generate options, and compare alternatives before final choices are made (Faraj, Pachidi and Sayegh, 2018; von Krogh, 2018; Raisch and Krakowski, 2021). With recent advances in generative artificial intelligence (GenAI), organizations can now create strategic scenarios and evaluate options by adding AI-generated content into decision processes before committing to a choice. This brings up questions about what is allowed, who has authority, and who is accountable, especially when outcomes are hard to predict and the limits of decision-making roles are unclear (Simon, 1979; Baird and Maruping, 2021; Dell'Acqua *et al.*, 2023; Brown *et al.*, 2024). In such settings, effectuation provides a useful lens, explaining how actors seek control through action, commitment, and stakeholder engagement (Sarasvathy, 2001; Wiltbank and Sarasvathy, 2006).

Effectuation, a decision logic centered on action and control under uncertainty, and related theories of uncertainty and managerial judgment rest on assumptions of human-centered interpretation, responsibility, and control (Knight, 1921; Sarasvathy, 2008; Penrose, 2009). GenAI changes these conditions by enabling large-scale option generation and evaluation through processes that are neither fully visible nor fully understood and that exceed what any individual can cognitively manage. The central human challenge therefore shifts from creating options to evaluating, filtering, and choosing among those that GenAI produces (Faraj, Pachidi and Sayegh, 2018; Baird and Maruping, 2021; Raisch and Krakowski, 2021). This creates a gap between traditional decision-making theories and how decisions are made with GenAI. The main challenge is to update decision theory for these new conditions.

Conceptual Approach, Theory Adaptation

This paper adopts a conceptual theory-adaptation approach to clarify and re-specify effectuation when changes in the focal phenomenon place pressure on its foundational assumptions while preserving its continuing relevance (Cornelissen, 2017; Jaakkola, 2020). The analysis is anchored at the level of the organizational decision system, where decision authority, information flow, and accountability are deliberately structured (Simon, 1979; Burton, Obel, B, and Hakonsson, D.D., 2020). It examines how organizations allocate authority and oversight when GenAI participates in framing, option generation, and evaluation. By changing how alternatives are produced and assessed, GenAI challenges the assumption that means, judgment, and control belong exclusively to human actors.

The focus is on decision contexts marked by high uncertainty and low predictive reliability, where effectuation has been theorized as a relevant non-predictive logic (Sarasvathy, 2001; Wiltbank and Sarasvathy, 2006). Although effectuation was developed mainly in entrepreneurial settings and later applied in established organizations (Brettel *et al.*, 2012), it is treated here as an organizational decision logic embedded in collective structures of authority, evaluation, and commitment (Felin *et al.*, 2012; Read *et al.*, 2016). GenAI changes the boundary conditions of effectuation by reshaping how means, control, and accountability are exercised in organizational decision systems (Faraj, Pachidi and Sayegh, 2018; Baird and Maruping, 2021; Raisch and Krakowski, 2021). The resulting tension reflects a mismatch between the theory's original foundations and new decision conditions. The response developed here is re-specification (Jaakkola, 2020).

The analysis proceeds in four steps. First, it makes effectuation's foundational assumptions explicit. Second, it identifies where those assumptions no longer hold when GenAI participates in decision processes. Third, it introduces decision boundaries as organizational adaptation mechanisms governing authority, admissibility, and accountability in joint human-GenAI decision contexts. Fourth, it revises effectuation principles considering boundary configuration and consolidates them in a framework with related propositions. To preserve empirical tractability, the claims are linked to observable features such as admissibility rules, escalation thresholds, and accountability assignments (Jaakkola, 2020; Lupp, 2023)

Theory Development

Effectuation as the focal domain theory

Sarasvathy (2001) developed effectuation theory to explain decision-making under uncertainty where prediction is unreliable, and Read et al. (2016) extended this logic by framing non-predictive control as shaping outcomes through action rather than forecasting. Effectuation is therefore suited to contexts in which uncertainty cannot be resolved in advance and must instead be navigated through action.

Effectuation is organized around five interrelated principles: means-driven action, affordable loss, strategic partnerships, leveraging contingencies, and control over prediction (Sarasvathy, 2001, 2008). Means-driven action begins from who the actor is, what they know, and whom they know. Affordable loss emphasizes limiting downside exposure rather than optimizing expected returns. Strategic partnerships reduce uncertainty through stakeholder commitments. Leveraging contingencies treats unexpected events as inputs to action, while control over

prediction replaces forecast-based planning with iterative enactment (Sarasvathy, 2001; Wiltbank and Sarasvathy, 2006). Across these principles, judgment, commitment, and control are exercised by human actors who author decisions and bear their consequences.

Effectuation also assumes human-centered judgment, interpretation, authority, and accountability. Uncertainty is engaged through experience, sensemaking, and social interaction, while consequential decisions remain attributable to identifiable human decision-makers, whether individuals or authorized collectives (Dew and Wiltbank, 2009; Arend, J. and Burkemper, 2015; Read *et al.*, 2016).

GenAI in organizational decision-making contexts

GenAI differs from earlier decision-support systems. Earlier systems assisted decision-makers by retrieving information, applying predefined rules, or optimizing within specified models, and relied on relatively stable decision premises, transparent logic, and human-defined evaluative criteria (Sprague Jr, 1980; Buchanan and Shortliffe, 1984). GenAI participates directly in problem framing, option generation, and evaluative comparison prior to choice, thereby shaping decision-making rather than merely supporting execution (Faraj, Pachidi and Sayegh, 2018; Raisch and Krakowski, 2021).

In this paper, GenAI is treated as a functional contributor to organizational decision processes, not as an agentic or accountable decision-maker. Its relevance lies in how it alters decision inputs and evaluative dynamics through large-scale option generation, probabilistic recombination of information, and AI-supported comparison across alternatives (Faraj, Pachidi and Sayegh, 2018; Raisch and Krakowski, 2021). Instead of replacing human choice, these capabilities shape which alternatives are generated, compared, and made salient before final judgment (von Krogh, 2018; Baird and Maruping, 2021).

A defining feature of GenAI involvement in decision-making is that it reallocates human cognitive effort. As GenAI can produce options and scenarios at scale, the human burden shifts from generating them to evaluating, filtering, integrating, and selecting among them (Faraj, Pachidi and Sayegh, 2018; Baird and Maruping, 2021). Under current technological conditions, this evaluation work cannot be fully automated or handed over to GenAI. GenAI capabilities vary sharply across domains and tasks, creating a jagged technological frontier in which performance is strong in some areas and unpredictable in others. Human judgment therefore

remains essential but increasingly centers on designing and governing the evaluative boundaries within which GenAI outputs are assessed, escalated, or overridden.

Decision boundaries as an organizational design construct

Decision boundaries are the rules an organization establishes to govern when and how GenAI outputs inform decisions. They document authority, admissibility, escalation, and accountability (Simon, 1979; Burton, Obel, B, and Hakonsson, D.D., 2020). Two mechanisms are especially salient: admissibility criteria, which determine which GenAI-created outputs may inform decisions, and escalation thresholds, which specify when GenAI-supported judgments require additional review, higher-level authorization, or human-only determination.

Organizations create, manage, and enforce decision boundaries at the organizational level. These boundaries act as design tools that influence behavior through roles, policies, and decision rules (Gulati, Puranam, P. and Tushman, 2012; Puranam, Alexy, O. and Reitzig, 2014; Burton, Obel, B, and Hakonsson, D.D., 2020). While their effects appear in individual and team decisions, the rules themselves are organizational. Boundary reliability refers to how consistently these rules are applied across decisions over time (Burton, Obel, B, and Hakonsson, D.D., 2020).

This construct draws on Simon's treatment of decision premises, authority structures, and accountability within organizational decision systems (Simon, 1979), and on Burton et al.'s (2020) view of decision rights and accountability as explicit design choices. Together, these foundations make it possible to analyze how GenAI strains effectuation's implicit assumption of human-exclusive control over decision inputs, evaluation, and commitment, and why boundary reconfiguration becomes an organizational design problem (Faraj, Pachidi and Sayegh, 2018; Raisch and Krakowski, 2021).

Decision-boundary process representation

To adapt the theory, the paper introduces a decision-boundary process model. The model links effectuation principles, GenAI's features, and organizational decision design. It shows how effectuation operates when GenAI is involved in framing problems, generating options, and evaluating choices, and how boundary rules govern admissibility, escalation, and accountability (Jaakkola, 2020).

General concepts such as governance and control are too broad to identify which design features matter when decision conditions change (Puranam, Alexy, O. and Reitzig, 2014; Burton, Obel,

B, and Hakonsson, D.D., 2020). Decision boundaries are more useful because they define who has authority, what inputs are allowed, how evaluations are managed, when decisions are escalated, and who is accountable (Simon, 1979; Burton, Obel, B, and Hakonsson, D.D., 2020). Framing the process in these terms makes it possible to adapt effectuation without attributing agency or responsibility to technology. Non-predictive control is therefore treated less as a matter of individual agency and more as an organizational question of how boundaries are set (Simon, 1979), especially when technology participates in decisions (Faraj, Pachidi and Sayegh, 2018; Raisch and Krakowski, 2021).

The framework is organized around three elements: decision inputs, human-GenAI interaction processes, and outcomes, including responsibility and accountability. GenAI expands available inputs beyond what an organization already knows and has experienced, weakening the classic effectuation assumption that means are inherently tied to human identity. Decision boundaries specify how such inputs enter decision processes, how they are evaluated, and how commitment and escalation are governed. The framework therefore makes hidden theoretical assumptions visible while remaining usable for empirical research (Langley, 1999; Cornelissen, 2017; Jaakkola, 2020). The next section uses this representation to compare classic effectuation with effectuation in the presence of GenAI.

Adapting Effectuation Theory to incorporate GenAI

When GenAI participates in framing, option generation, and evaluation, the conditions under which effectuation logic operates change. Options may be generated at scale, evaluative processes redistributed, and elements of decision construction become no longer exclusively human. These shifts raise questions about the fit between effectuation's foundational assumptions and emerging decision contexts, suggesting that some degree of theory adaptation may be required. This adaptation proceeds through comparative analysis at the level of theoretical claims (Jaakkola, 2020). This paper examines where classic effectuation remains applicable, where its assumptions are challenged, and how the theory might be updated to maintain coherence.

The analysis focuses on principles most closely linked to human authorship, judgment, and control, since these are most affected when GenAI expands options, changes how evaluation is done, and takes part in building decisions before commitment (Faraj, Pachidi and Sayegh, 2018; Raisch and Krakowski, 2021). In these situations, evaluative judgment becomes a more prominent constraint, and control often centers on evaluation, deployment, and escalation.

Table 1 presents a contrastive analysis of classic effectuation and effectuation in the context of GenAI participation, focusing on the principles most affected by AI-generated options, less transparent evaluation, and shifting control to boundary design.

Table 1 shows that GenAI does not affect all effectuation principles equally. The greatest strain falls on principles anchored in human authorship, judgment, and control, while observable boundary mechanisms such as admissibility rules, escalation thresholds, override rights, and accountability assignments indicate how effectual control is preserved under AI participation.

Principle (P) / Assumption (A)	Classic effectuation	With GenAI	Observable indicator	Implication
Means (P)	Human-anchored means: identity, knowledge, relationships.	AI-generated options expand means beyond existing knowledge and ties.	Admissibility rules; human/AI input distinction.	Means expand; admissibility must be specified.
Affordable loss (P)	Risk assessed through human resource commitment.	GenAI expands option/ scenario generation at low marginal cost; risk shifts to evaluation, deployment, escalation.	Approval gates; sign-off thresholds; accountability assignments.	Affordable loss shifts from generation to commitment and implementation.
Partnership (P)	Stakeholder commitments reduce uncertainty through shared obligation.	AI contributes input, not commitment; commitment remains human and organizational.	AI-use protocols; no AI commitment authority.	Uncertainty stabilization shifts from stakeholder commitment alone to boundary governance.
Control over prediction (P)	Human actors retain authorship and responsibility.	Control exercised through admissibility, oversight, escalation, override.	Override rights; escalation paths; final decision authority.	Control relocates from authorship to boundary design.
Cognitive effort allocation (A)	Effort focused on generating alternatives and acting under uncertainty.	Effort shifts to evaluating, integrating, and arbitrating AI-generated options.	Review committees; monitoring roles; expert oversight.	Boundary configurations vary by where judgment is concentrated.
Accountability attribution (A)	Accountability tied to human decision-makers.	Accountability remains human, mediated by boundary design.	Role descriptions; accountability matrices; review procedures.	Human accountability is preserved through boundary specification.

Table 1. Contrastive analysis of classic effectuation and effectuation under GenAI
Notes: Classic effectuation draws primarily on Sarasvathy (2001, 2008), Dew & Wiltbanik, (2009), Read et al. (2016), GenAI adaptation draws on Faraj et al. (2018), Raisch and Krakowski (2021), Baird and Maruping (2021), von Krogh (2018) and Doshi et al. (2025).

Refining Effectuation Theory

Theory adaptation becomes necessary when changing conditions alter fundamental parts of a theory while leaving its core logic relevant (Jaakkola, 2020). Under GenAI participation, means, affordable loss, partnership, and control are most directly affected because they depend

on human authorship, judgment, and authority. Leveraging contingencies remains relevant but is less directly altered because GenAI increases variation while people still determine which changes become consequential. The analysis also brings two cross-cutting assumptions to the foreground: where cognitive effort is concentrated and how accountability is assigned. Both are implicit in classic effectuation but become more salient when GenAI participation shifts evaluative work and makes responsibility attribution less clear.

Three adaptations follow. First, decision-making begins from what humans know and can do, but now also incorporates AI-generated options and scenarios, with boundaries determining which AI inputs are acceptable and how they inform decisions. Second, affordable loss changes because option-generation costs decline while organizational risk concentrates at evaluation, deployment, commitment, and escalation. Third, control shifts as GenAI participates in generation and evaluation, so non-predictive control is exercised increasingly through admissibility, interpretation, override, and escalation mechanisms. These shifts relocate human control and accountability to the design of organizational decision boundaries. Partnership remains a human commitment mechanism, and leveraging contingencies still depends on human judgment over which AI-generated variations become consequential. On this basis, three decision boundary configurations are identified: augmented, hybrid, and delegated.

GenAI-Adapted Effectuation Framework and Propositions

Framework development

This section introduces a Decision-Boundary Process Framework that links the re-specified effectuation principles to organizational boundary configurations. The framework explains how decision-making changes when GenAI is involved in framing problems, generating options, and evaluating choices. In classic effectuation, means-driven action, affordable loss, partnership, leveraging contingencies, and control rely on human judgment and responsibility. With GenAI, these principles still apply, but they operate differently because authority, admissibility, oversight, and escalation are managed at the organizational level. The framework therefore preserves effectuation’s core logic while specifying the changed conditions under which it operates.

The adaptation focuses on four classic principles: means, affordable loss, partnership, and control. It also highlights two important assumptions: the distribution of cognitive effort and the assignment of accountability. Leveraging contingencies remains included but is less affected by GenAI than the other principles. To illustrate these differences, the framework

distinguishes three boundary configurations: augmented, hybrid, and delegated. These configurations show how authority, evaluation, and accountability are divided between humans and GenAI. The next section explains these configurations in more detail using the process framework shown in Figure 1.

Decision-boundary configurations and proposition development

The Decision-Boundary Process Framework identifies three ideal-type configurations: augmented, hybrid, and delegated. These show how authority, evaluation, and accountability are allocated when GenAI is involved. In augmented configurations, where GenAI supports analysis but humans retain decision authority, GenAI contributes to option generation and evaluation while humans make the final choice. In hybrid configurations, where evaluative authority is shared, judgment is distributed across human and computational elements and across stages of the decision process (Raisch and Fomina, 2024). In delegated configurations, where GenAI operates within bounded organizational parameters, human involvement shifts toward designing, monitoring, and revising decision boundaries.

Across all configurations, humans remain accountable. Situated at the level of organizational decision systems, the framework links observable features of boundary design, including delegation scope, admissibility criteria, and escalation rules, to variation in means, affordable loss, partnership, control, evaluative effort, and accountability. It also captures how the human role shifts across configurations, moving from direct participation in evaluation and decision-making toward co-evaluation and boundary design. The research propositions below draw on Figure 1 and link boundary configurations to observable organizational features, including admissibility criteria, escalation thresholds, override rights, role allocations, and accountability assignments.

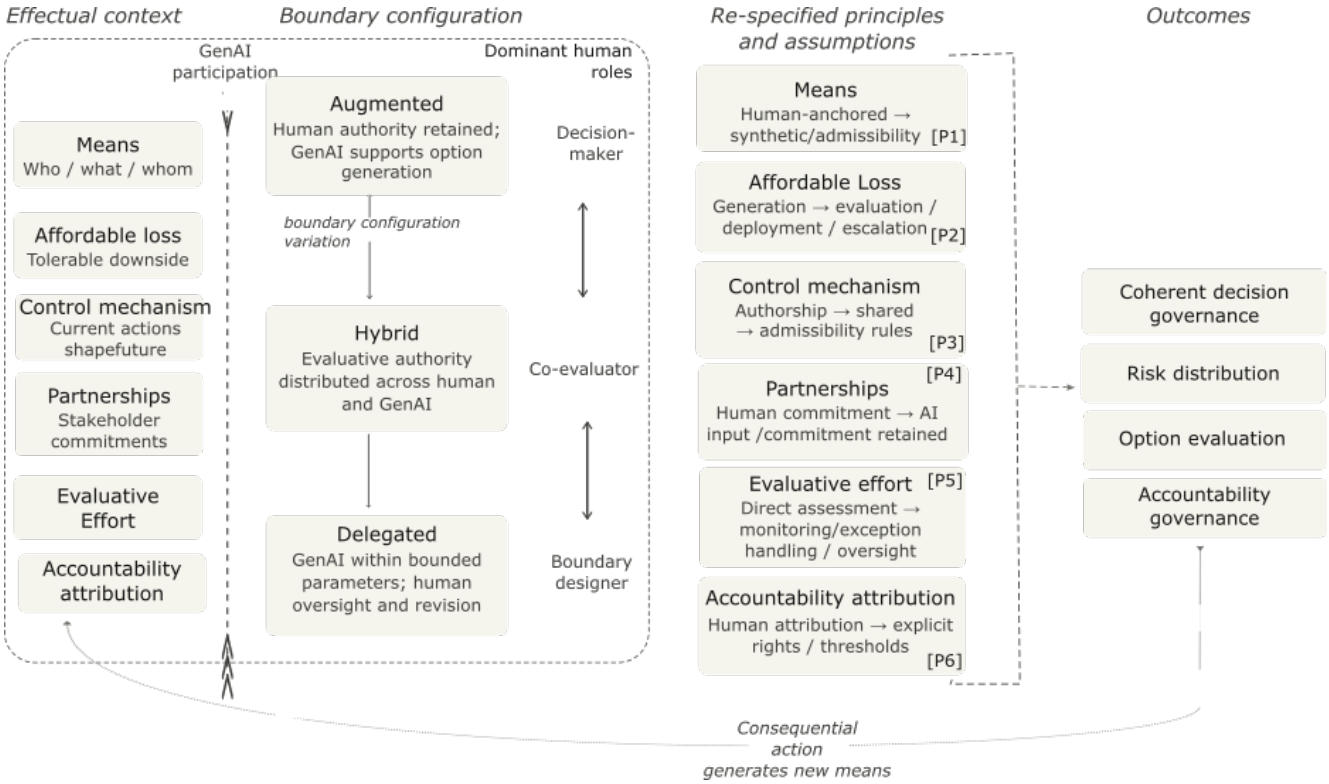


Figure 1: Effectuation adaptation Decision-Boundary Process Framework

Means-driven action. In classic effectuation, action begins from human-anchored means: who actors are, what they know, and whom they know. Under GenAI participation, available means expand through AI-generated options and scenarios, making admissibility and interpretation more important.

> RP1. Delegated configurations are more likely than augmented configurations to use explicit admissibility criteria for AI-generated options and scenarios entering organizational decision processes.

Affordable loss. In classic effectuation, affordable loss is assessed through resource commitments made during experimentation. Under GenAI participation, option and scenario generation become cheaper, while organizational risk appears later, during evaluation, deployment, commitment, and escalation.

> RP2. Affordable loss is assessed earlier in augmented configurations and later, in delegated configurations, at evaluation, deployment, commitment, and escalation.

Partnership. Partnership remains a human commitment mechanism even where GenAI shapes decision inputs and evaluation. Commitment, risk-bearing, and consequential obligation remain human and organizational.

> RP3. Partnership remains human across all configurations, but delegated configurations rely more heavily on formal protocols that separate AI-supported input from human and organizational commitments.

Control over prediction. Effectuation treats control as action based. Under GenAI participation, control depends increasingly on rules governing admissibility, evaluation, override, and escalation.

> RP4. Control is exercised more through admissibility, evaluation, escalation, and override rules in delegated configurations than in augmented configurations.

Cognitive effort allocation. As GenAI expands the number of options and scenarios, the main bottleneck shifts from generating alternatives to evaluating and selecting among them. Human effort shifts accordingly across configurations.

RP5. Augmented configurations keep human evaluative effort closer to direct option assessment, hybrid configurations distribute that effort across human and computational elements, and delegated configurations concentrate more of it on admissibility monitoring, exception handling, and override governance.

Accountability attribution. GenAI can shape framing, generation, and evaluation, while responsibility for outcomes remains human and organizational. As delegation increases, preserving clear accountability requires more explicit decision rights, escalation thresholds, and review arrangements.

RP6. Delegated configurations require more explicit accountability assignments and escalation thresholds than augmented configurations to preserve human responsibility for AI-supported decisions.

These research propositions translate the framework into testable relationships. They do not predict performance outcomes but connect the analysis to observable organizational features such as role assignments, admissibility rules, escalation points, override rights, and accountability.

Discussion, Implications, and Future Research

In this paper, we respecify effectuation for organizational decision-making in the context of GenAI. It shifts attention from GenAI as a tool for automation or improvement to the organizational boundaries that structure authority, evaluation, and accountability when non-human systems shape the content of decisions. In doing so, it shows that effectuation remains useful when GenAI participates, provided its assumptions are re-specified. Its core logic of non-predictive control, human judgment, and responsibility under uncertainty still holds, but under altered operating conditions. Means-driven action, affordable loss, partnership, and control are most directly re-specified, while leveraging contingencies remains relevant under changed conditions. This re-specification extends effectuation theory beyond its entrepreneurial origins by demonstrating that its core principles are not fixed but adaptive and capable of accommodating fundamentally new decision-making conditions introduced by generative AI, thereby deepening our understanding of how effectual logic operates in technologically transformed organizational contexts. For managers, the central implication is that effectuation in GenAI-supported environments relies increasingly on how decision boundaries are designed.

Organizations that clearly define rules for admissibility, escalation, override, and accountability are better able to maintain control under uncertainty and avoid unclear responsibility.

This paper re-specifies effectuation theory at a general level and does not address differences across specific GenAI models or architectures. It focuses on organizational decision structure and boundary design, leaving detailed governance, regulatory, and ethical frameworks outside its scope. Future research could examine how augmented, hybrid, and delegated configurations appear across organizations and decision contexts, how they shape evaluative effort, control, partnership, and accountability in practice, and how boundary designs drift or are recalibrated as organizational capabilities and GenAI technologies evolve.

Conclusion

This paper examines how effectual decision logic operates when GenAI contributes to decision inputs, options, and evaluations. GenAI is treated not as a substitute for human judgment, but as a condition that reshapes the boundaries within which organizational decisions are made. By shifting attention from decision-makers alone to decision architecture, the paper clarifies how authority, evaluation, and accountability are organized when decision inputs are no longer exclusively human. The paper advances effectuation theory by showing that it remains viable under GenAI participation when its assumptions are selectively re-specified. It also contributes to organizational decision-making by showing that decision boundaries are the organizational mechanisms that preserve non-predictive control, accountability, and judgment under uncertainty. The central challenge posed by GenAI is therefore not simply whether organizations adopt it, but how they design decision systems that govern its participation while keeping responsibility human.

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WHY PEOPLE SHARE DEEPFAKES: THE ROLE OF PERCEIVED CREDIBILITY, COGNITIVE ABILITY AND ETHICS

Bhattacharya, Saurabh[1]; Agnihotri, Arpita[2]

[1] Newcastle University Business School, Newcastle University, Newcastle upon Tyne, United Kingdom

[2] School of Business Administration, Penn State Harrisburg, Middletown, Pennsylvania, United States of America

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Introduction

The rapid advancement of artificial intelligence has enabled the creation of deepfakes, highly realistic synthetic media capable of manipulating visual and auditory content. These developments are transforming the misinformation landscape, raising concerns around trust, privacy, and societal stability (Hancock and Bailenson, 2021). Recent evidence suggests that deepfakes can influence attitudes and behaviour even when individuals are aware of potential manipulation (Ching et al., 2025). As communication becomes increasingly multimodal, visual misinformation is more engaging and harder to detect than text-based content.

While prior research has focused on younger populations, older adults remain underexplored despite evidence suggesting higher susceptibility to misinformation (Brashier and Schacter, 2020). At the same time, stronger ethical orientations among older individuals may shape sharing behaviour, suggesting a more nuanced response. Despite the growing literature, limited research explains how perceived credibility translates into sharing behaviour (Wang, 2026).

Purpose, Aim and Objectives

This study examines how deepfake videos (vs. real videos) influence sharing intentions across age groups. It investigates perceived credibility as a mediating mechanism and explores the moderating roles of cognitive ability, digital literacy, and ethical position.

Literature Review and Theoretical Framework

Deepfakes extend misinformation by combining realism and emotional salience, increasing persuasive impact (Hancock and Bailenson, 2021). Unlike textual misinformation, video content is processed heuristically, allowing perceptual realism to override analytical scrutiny. Perceived credibility therefore plays a central role in shaping sharing behaviour (Jin et al.,

2023). Importantly, deepfake videos can continue to influence beliefs even when individuals are warned about manipulation (Clark and Lewandowsky, 2026). Accordingly:
H1: Exposure to deepfake videos (vs. real videos) positively influences sharing intention.
H2: Perceived credibility mediates the relationship between video type and sharing intention.
Age-related differences shape credibility judgements due to cognitive decline and ethical considerations.
H3: Age moderates the relationship between video type and perceived credibility, such that older individuals perceive deepfake videos as more credible.
Cognitive ability and digital literacy influence information evaluation. Lower cognitive ability increases reliance on heuristics, while higher digital literacy enhances critical evaluation (Bejaković and Mrnjavac, 2020).
H4: Cognitive ability and digital literacy moderate the relationship between video type and perceived credibility, such that lower cognitive ability and lower digital literacy increase perceived credibility of deepfake videos.
Ethical considerations constrain sharing behaviour.
H5: Ethical position moderates the relationship between perceived credibility and sharing intention, such that stronger ethical positions reduce sharing intention.
Together, these relationships form a moderated mediation framework explaining how deepfake exposure influences sharing behaviour.

Methodology and Methods

The study adopts an exploratory sequential mixed-methods design. A qualitative phase (n = 10, UK) refines the model, followed by a pretest (n = 75) and two experiments (n = 400). Participants are randomly assigned to view real or deepfake videos. Data will be analysed using mediation and moderated mediation techniques.

Expected Findings and Contribution

The study expects perceived credibility to mediate the relationship between deepfake exposure and sharing intention. Older individuals are likely to exhibit higher perceived credibility but lower sharing when ethical considerations are salient. Cognitive ability and digital literacy are expected to reduce susceptibility to deepfakes.
The study contributes by extending misinformation research to deepfake videos and offering a unified framework explaining how cognitive, technological, and ethical factors jointly shape sharing behaviour.

Originality and Value

This study advances research by shifting focus from textual to video-based misinformation and integrating multiple individual-level factors into a single framework. It challenges assumptions of uniform vulnerability among older adults and highlights conditional susceptibility. Future research may explore cross-cultural contexts and behavioural data.

Theoretical and Practical Implications

Theoretically, the study refines credibility models by demonstrating how judgements are shaped by cognitive constraints, technological environments, and ethical considerations.

Practically, the findings inform digital literacy interventions, particularly for older populations (Bejaković and Mrnjavac, 2020), and highlight the role of ethical awareness in reducing misinformation sharing. Platforms can implement credibility cues and warning systems (Jin et al., 2023), while corrective strategies such as self-debunking interventions may further reduce misinformation influence (Lu, 2025).

Research Limitations

The study has several limitations. Experimental stimuli may not fully reflect real-world exposure to deepfakes, and self-reported measures may introduce bias. Additionally, the UK-based field study limits generalisability. Future research should incorporate behavioural and cross-cultural data.

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PIONEERING ORIENTATION AND ORGANISATIONAL PERFORMANCE: THE MEDIATION ROLE OF AI CAPABILITY

Levi-Bliech, Michal[1]; **Dahan, Gavriel**[2]

[1] School of Management, Logistics Department, Western Galilee College, Acre, Israel
[2] School of Management, Western Galilee College, Acre, Israel

Keywords: AI capability, Pioneering orientation, Organisational performance, Mediation

Abstract

This study examines how pioneering orientation influences organisational performance through AI capability. Drawing on the Resource-Based View (RBV) and Dynamic Capabilities (DC) theory, we propose that AI capability translates pioneering orientation into organisational performance. Data from 195 managers in Israeli international firms were analysed using SmartPLS 4. The findings indicate that pioneering orientation positively affects AI capability and organisational performance, and that AI capability partially mediates this relationship.

Introduction

In digital markets, firms increasingly compete by adopting new technologies, business models, and market opportunities ahead of competitors. Pioneering orientation reflects a firm's proactive approach to introducing novel practices, technologies, and value propositions ahead of competitors. Prior research suggests that pioneering firms shape market structures and consumer expectations (Lieberman and Montgomery, 1988, Narver et al., 2004). However, evidence on its direct performance impact remains mixed.

One explanation is that pioneering orientation requires complementary capabilities to improve performance. AI capability refers to a firm's ability to deploy AI technologies, data infrastructure, and analytics-driven decision-making. AI technologies are transforming marketing decision-making and execution. AI-driven tools support data analysis, customer prediction, resource allocation, and marketing automation (Huang and Rust, 2021). This study examines how pioneering orientation influences organisational performance (ORGP) and what role AI capability plays in this relationship. It tests AI capability as a mediator between pioneering orientation and organisational performance. This study contributes to the literature by linking pioneering orientation to organisational performance and by conceptualizing AI capability as a strategic marketing capability.

Background and Hypotheses

Pioneering orientation (PO) reflects a firm's tendency to lead market and technological change, yet its performance implications depend on complementary capabilities such as AI capability (Covin et al., 2000). Organisational performance is examined as the outcome of pioneering orientation and AI capability. AI capability reflects the firm's ability to use AI for learning, decision-making, and value creation (Mikalef and Gupta, 2021; Wamba-Taguimdje et al., 2020).

Accordingly, the following hypotheses are proposed:

H_1: PO positively affects ORGP.

H_2: PO positively affects AI capability.

H_3: AI capability positively affects ORGP.

Results

The results of the hypothesis tests show that, in the direct effects, all hypothesised relationships were significant ($p < .001$). Thus, *H1-H3* were supported. Regarding the specific indirect effect, the findings show that the path PO → AI → ORGP was significant ($p < .05$).

Discussion and Conclusions

The findings show that PO and AI capability positively affect ORGP, with PO showing the stronger effect. Managers should strengthen PO in order to improve decision-making, efficiency, and performance. Additionally, regarding the mediating role of AI capability in the relationship between PO and ORGP, the findings show that AI capability has a partial mediating role in this relationship. Being a market pioneer alone is insufficient, firms must invest in developing AI capabilities**.** Therefore, managers who want to improve their ORGP need to integrate both AI capabilities and PO to achieve better ORGP and ultimately gain a competitive advantage. AI capability transforms pioneering risk into a competitive advantage by enabling more intelligent execution. AI capability development should be prioritized alongside market exploration to ensure performance benefits.

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EMPLOYING AI TO EVALUATE HOW LINGUISTIC CONCRETENESS INFLUENCES CROWDFUNDING CAMPAIGN SUCCESS

Andreas Gregoriades, Michael Georgiades, Yioula Melanthiou

Keywords: Crowdfunding; Linguistic Concreteness; Large Language Models; Text Classification; Ensemble Learning; Kickstarter.

Introduction.

Crowdfunding has become an important alternative financing mechanism for entrepreneurs, with campaign descriptions and linguistic style playing an important role in funding decisions. Linguistic concreteness, which refers to the extent to which project descriptions provide specific rather than abstract information, can influence crowdfunding outcomes. However, limited attention has been devoted to examining whether the effect of linguistic concreteness varies across project categories characterized by different audience motivations and expectations. This study addresses this gap by employing an AI-based approach.

Purpose, Aim and Objectives

This research examines the influence of linguistic concreteness on crowdfunding success across Technology and Film & Video campaigns and investigates whether its effect varies between the two categories. An AI-based ensemble classification approach is employed to assess linguistic concreteness in campaign descriptions, followed by statistical analysis of its relationship with campaign success.

Literature Review and Theoretical Framework

Prior crowdfunding research demonstrates that campaign language influences backers' perceptions, trust, and funding decisions (Nielsen et al, 2021). However, existing studies provide limited evidence on whether the effectiveness of linguistic strategies varies across project categories. To address this gap, the study integrates Language Expectancy Theory and Self-Determination Theory. The former suggests that persuasive effectiveness depends on the alignment between linguistic style and audience expectations, while the latter distinguishes between intrinsic and extrinsic motivations.

Technology projects tend to attract backers concerned with functional outcomes, product performance, specifications, and tangible rewards, whereas Film & Video projects are more closely associated with intrinsic motivations such as personal interest, emotional engagement, identity, and symbolic meaning (Dousios et al, 2025). Concrete language may therefore be particularly persuasive for Technology campaigns, as specific and observable information can facilitate project evaluation and reduce uncertainty. In contrast, its influence may be more limited for Film & Video campaigns, where backers may place greater emphasis on emotional and symbolic value (Tafesse, 2021). Accordingly, the proposed theoretical framework predicts a positive effect of linguistic concreteness on Technology campaign success, a limited effect on Film & Video campaign success, and a significant difference in its effect across the two categories.

Methodology

The study combines LLM-based text classification with statistical inference. Kickstarter campaigns' descriptions from the Technology and Film & Video categories are analysed. The proposed LLM-based approach analyses text holistically in contrast to dictionary-based techniques. Two LLM models are fine-tuned using secondary labelled concreteness data and evaluated on held-out test data. The models are subsequently applied independently to Kickstarter campaign descriptions to assess their linguistic concreteness, and their predictions are combined to increase confidence in the resulting concreteness measure.

A binary logistic regression model is estimated with campaign success as the dependent variable and the AI-derived linguistic concreteness classification as the focal independent variable. Project category is included as a moderator, to determine whether the effect of concreteness on campaign success differs between Technology and Film & Video campaigns.

Findings and Contribution

The results provide strong evidence that the effectiveness of linguistic concreteness is category dependent. For Film & Video campaigns, linguistic concreteness does not significantly influence campaign success, white it has a strong positive effect on the success of Technology campaigns. The interaction between linguistic concreteness and project category confirms that the effect of concreteness differs significantly between the two categories.

Theoretical and Practical Applications and Implications

The study makes both theoretical and methodological contributions. Theoretically, it demonstrates that the effectiveness of linguistic concreteness depends on project category and the corresponding motivations and expectations of backers, suggesting that persuasive crowdfunding communication should be adapted to its target audience. Practically, Technology campaign creators may benefit from emphasizing specific functionality, and measurable outcomes. Methodologically, the study introduces an ensemble LLM-based approach for assessing linguistic concreteness, providing a context-sensitive alternative to conventional dictionary-based techniques and demonstrating how AI-derived linguistic measures can be integrated with statistical models to investigate crowdfunding success.

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BROADCASTING ON DIFFERENT WAVELENGTHS: CONSUMER INNOVATIVENESS, PRODUCT PREFERENCES, AND WORD-OF-MOUTH

Moldovan, Sarit[1]

[1]Department of Management and Economics, The Open University of Israel, Ra'anana, Israel

Keywords: Consumer Innovativeness, Word-of-Mouth, Diffusion of Innovations, Product Originality, Product Usefulness

Diffusion theory assumes that innovators facilitate adoption by influencing less innovative consumers through word-of-mouth (WOM) (Rogers, 2003). While prior research documents innovators' central role in social networks, it largely assumes that their WOM is relevant for mainstream consumers' adoption decisions. This research challenges this assumption by examining whether the content of innovators' WOM aligns with the informational needs of less innovative consumers. Specifically, it proposes that systematic differences in preferences for product originality versus usefulness create a misalignment between WOM supply and demand, potentially slowing diffusion.

Prior research shows that innovators are attracted to novel innovations, whereas less innovative consumers favor functional value (Easingwood and Harrington, 2002; Li et al., 2015). Innovators are also more communicative and act as opinion leaders, while less innovative consumers rely heavily on WOM from prior adopters (Bartels and Reinders, 2011; Rogers, 2003). This research argues that this asymmetric but complementary relationship may become less effective when innovators disproportionately emphasize originality in their WOM. Building on this logic, this research examines systematic differences in product preferences and communication between innovators and less innovative consumers, focusing on how originality and usefulness shape product evaluations and the content of word-of-mouth across adopter segments.

Study 1 examined whether innovators and less innovative consumers differ in their evaluations of original versus useful products. A between-subjects experiment (N = 251) manipulated product features (originality vs. usefulness) and measured consumer innovativeness. Regression analyses revealed a significant effect of innovativeness on product evaluation (B =

.363, $p < .001$) and an interaction between innovativeness and product condition ($B = -.368$, $p = .003$). Less innovative consumers evaluated the useful product ($M = 3.914$) more favorably than the original product ($M = 3.256$, $B = .658$, $p = .007$), whereas innovators showed a marginal preference for the original ($M = 4.818$) over the useful product ($M = 4.426$, $B = -.392$, $p = .105$). These findings indicate systematic differences in the type of innovation valued by each segment.

Study 2a (N = 104) showed that increasing perceived product originality via a font-style manipulation (Cho and Schwarz, 2006) enhanced evaluations among innovators ($M_{regular_fonts} = 3.644$, $M_{italics} = 4.435$, $B = .79$, $p = .02$), but not among less innovative consumers ($t < 1$). Study 2b ($N = 98$) showed that providing additional usefulness information improved evaluations among less innovative consumers ($M_{no_information} = 2.376$, $M_{usefulness_information} = 3.292$, $B = .917$, $p = .007$), but not among innovators ($t < 1$). Together, these studies demonstrate asymmetric evaluation processes across adopter segments.

Study 3 ($N = 178$) showed that innovativeness predicted WOM intentions ($B = .359$, $p = .001$), and this effect was moderated by WOM focus ($B = -.448$, $p = .02$). Innovators reported stronger intentions to spread originality-focused ($M = 4.255$) than usefulness-focused WOM ($M = 3.492$, $B = -.763$, $p = .034$), whereas less innovative consumers reported low WOM intentions regardless of content ($p = .228$). These findings demonstrate a systematic asymmetry in WOM content.

Study 4 provided field-based validation using data from adopters ($N = 289$). Perceived product originality predicted intentions to spread originality-focused WOM ($B = .394$, $p < .001$), particularly among innovators (interaction $B = .102$, $p = .057$). Both innovators and less innovative consumers reported exposure to originality-focused WOM ($B = .367$, $p < .001$), indicating that such communication is prevalent in the marketplace.

This research reveals a systematic misalignment in WOM content across adopter segments. It contributes to diffusion theory by identifying communication content as a critical mechanism shaping diffusion outcomes. From a managerial perspective, the findings highlight the importance of actively communicating usefulness as innovations move beyond early adopters.

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THE ROLE OF FOOD WASTE REDUCTION IN PROMOTING SUB-OPTIMAL FOOD THROUGH DIGITAL MARKETING IN SOUTH-EASTERN EUROPE

Ivanova, Lora[1]; Kapoulas, Alexandros[2]

[1]Business Administration and Economics Department, CITY College, University of York Europe Campus, Thessaloniki, Greece

[2]University of York Europe Campus, School of Business ,Thessaloniki , Greece

Keywords: Food Waste Reduction Platforms (FWRPs); Digital Marketing Sustainable Marketing; Imperfect Food; Food Waste Reduction; Sharing Economies; Sustainable Consumption; South-Eastern Europe;

Introduction

Food waste (FW) is a widely discussed sustainable issue (Lins et al., 2021). In 2022, the global FW accounted for 1.05 billion tonnes, including inedible components, translating to an average of 132 kg per person (Carvalho et al., 2025). One of the greatest reasons for waste at the level of consumption in Europe is the appearance of products (Porter et al., 2018). They are still edible, yet their outlook differs from the traditional appearance, referring to such products as “ugly” products, including sub-optimal and perishable food (de Hooge et al., 2022). These goods may be classified as such due to visual, temporal or peripheral defects (Loebnitz and Grunert, 2015; Aschemann-Witzel, 2021; White et al., 2016). The consumption of such food remains limited, specifically in South-Eastern Europe (SEE) for various reasons. To overcome this challenge, Food Waste Reduction Platforms (FWRPs) have emerged, connecting dining establishments with consumers, reducing the generation of waste and optimizing their budgets.

Purpose, Aim and Objective

This study explores the role of FWRPs in the region, investigating the developed digital marketing strategies and their impact on promoting “ugly” food products as well as contribution to sustainable consumption. Many academics illustrate Food Waste Reduction Platforms as sustainable innovation, driving environmental improvement and smart resource utilisation (Amaral and Orsato, 2023). Presently, such platforms are popular in Western Europe, while in SEE there is limited evidence.

Literature Review

Literature reveals that businesses are open to implement such innovative solutions to reduce costs and establish new revenue streams, selling at a lower price (Amaral and Orsato, 2023). FWRPs reduce FW by connecting retail stores and customers, enhancing the effectiveness of last-minute discounts while combatting the global issue (Yang and Yu, 2026). Considering that the business model is still developing, academics like Hong et al. (2023) define them in various ways - Food Waste Mobile Applications (FWMAs) or Food Waste Reduction Platforms (FWRPs). One successful example of such a business is Too Good To Go (TGTG). The research of Santos‑Corrada et al. (2023) concludes that health and functionality along with social and economic factors shape the motivations of consumers.

Methodology and Methods

The exploratory study used a qualitative method, conducting interviews with FWRPs founders, located in SEE (Bulgaria, Greece and Serbia). Many scholars state that this method as the most appropriate one for uncovering new phenomena (Creswell and Creswell, 2018; Lim, 2024). Interviews included open-ended questions, allowing founders to share valuable insights related to the industry and consumer behavior in the region. The data obtained was analysed via thematic analysis, uncovering patterns and differences in the business models, digital marketing activities and experience with targeting young audiences.

Findings and Contributions

The three FWRPs have overlapping business models, offering discounts from 40% to 90% as social media serves as the primary channel for communication. The analysis indicates that the Bulgarian platform has vast experience with digital marketing strategies. The Greek and Serbian entities, on the other hand, shared that social media allows them to promote themselves, considering that it is a less expensive tool as both startups have budget constraints.

At the beginning the Bulgarian platform designed its messaging techniques and values around sustainability. However, at a later stage the founder uncovered that pricing has the greatest impact on younger consumers. Interestingly, Serbians were not familiar with FWRPs and the primary goal of the business was to build messaging techniques that not only promote green initiatives, but also educates consumers. According to the entrepreneur the biggest challenges in the region are limited partner locations which minimises the variety of products along with lack of delivery. Furthermore, founders stressed that the hospitality and restaurant industry still do not acknowledge the benefit of joining sustainable initiatives, despite the positive brand image (Rotondo and Chow, 2025).

The FWRPs utilise various techniques when building trust with customers, including monitoring and referral programs as well as pricing strategies. Managers suggest that startups in SEE strive for professionalism, transparency and authenticity. Lastly, all three interviewees believe that genuine and educational content which stresses on better pricing contribute to the overall success of their digital marketing efforts.

Research Limitations

The nature of the study is exploratory and as such, several limitations have been identified. The limited number of platforms investigated does not outline different strategies that are developed in the market. Secondly, the research focuses on a specific region, preventing us from making generalisations. Lastly, the market is still maturing and the business model may change over time.

Originality and Value

The findings contribute to the existing literature on digital marketing for sustainable initiatives, stressing on the importance of FWRPs as mediator between businesses and consumers. Moreover, it elaborates on the knowledge on sustainable consumption and practices in South-Eastern Europe.

Theoretical and Practical Implications

The study provides practical insights for marketers and managers, outlining the significance of good pricing strategies, the value of building relations and creating online engagement to raise awareness of "ugly" food products in SEE markets.

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SPEED AND SIMPLIFICATION IN CONSUMER BEHAVIOR: THE NEXUS OF TECHNOLOGICAL TEMPORAL DELEGATION, TIME PERCEPTION, AND CHOICE STRATEGY

Moutran, Serena[1]; Thrassou, Alkis[2]

[1]University of Nicosia, Nicosia, Cyprus

[2]University of Nicosia, Nicosia, Cyprus

Keywords: Technological Temporal Delegation, Choice Strategy, Decision-making, Decision Delegation, Consumer Behaviour, Time Pressure, Time-perception, Choice Quality.

Introduction and Problem Statement

Modern consumption is increasingly defined by a "nexus of speed," wherein structurally accelerated digital environments impose high decision pressure, driving a shift from systematic, compensatory reasoning toward non-compensatory heuristic processing (Godinho et al., 2016; Hochman, 2024). Consumers increasingly rely on AI-mediated decision aids to evaluate alternatives, with perceived usefulness and trust in AI shaping pre-purchase judgement (Lei & Liu, 2025; Waddell, 2025). This reliance is driven by time-pressure inherent in modern lifestyles, which reduces information processing capacity and heightens the adoption of simplified choice heuristics (Ordóñez et al., 2015; Godinho et al., 2016). When consumers highly value their time, they prefer convenience-oriented strategies (Benoit et al., 2017; Heinonen, 2004), motivating a transition toward "hybrid" and "GenAI consumers" who delegate cognitive labour to automated systems. (Huang & Rust, 2025).

Research Aim and Objectives

While it is established that time-pressure forces a shift from systematic to heuristic processing (Hermanns & Teubner, 2025), existing literature has not fully accounted for the role of 'surrogate cognition' in this transition (Jose et al., 2025). The primary aim of this research is to investigate how Technological Temporal Delegation (TTD), the outsourcing of time-intensive cognitive tasks to surrogate systems such as voice assistants or algorithmic curation, moderates the relationship between the combination of time-pressure and time-value perception and consumer choice strategies. Specifically, the study examines how this delegation alters consumption outcomes, focused on choice diversity and decision satisfaction. The objectives are to: theoretically examine the impact of time-pressure on cognitive simplification; theoretically analyse the mediating role

of time-perception; empirically evaluate TTD as a moderator; empirically assess the impact on consumption outcomes; and develop and test a "Temporal-Cognitive Nexus" framework.

Literature Review and Theoretical Framework

Grounded in Information Processing Theory, theory posits that situational time-pressure reduces cognitive capacity, forcing a transition from systematic reasoning to non-compensatory heuristics **(H1)** (Bobadilla-Suarez & Love, 2018; Godinho et al., 2016). Furthermore, the perception of time-value based on Economic Theories of Time and Service Convenience frameworks (Benoit et al., 2017; Heinonen, 2004) coupled with the psychological "mindset of scarcity," which taxes mental bandwidth (Smith et al., 2020), supports **H2**: the perception of time-value positively drives choice simplification.

The core theoretical contribution utilizes the Extended Mind Thesis and Cognitive Offloading Theory (Jose et al., 2025; Litvinova et al., 2024; Smith et al., 2020) to position TTD as a multi-dimensional moderator. Under high internal cognitive costs, consumers leverage "exogenous cognition," offloading decision tasks to surrogate systems (**H3a/b**).

However, grounded in Bounded Rationality and the Paradox of Choice, the framework suggests that while simplification conserves energy, it promotes "satisficing" and narrow framing (Ren & Huang, 2017). Consistent with choice overload, extensive options reduce commitment and satisfaction (Iyengar & Lepper, 2000), negatively impacting choice diversity **(H4)**. Drawing on Hyperbolic Discounting, the study proposes that such strategies favor immediate "present-bias" relief (**H5**) (Laibson, 1997; Ren & Huang, 2017). Finally, applying Psychological Reactance (Brehm, 1966) and Locus of Control (Rotter, 1966), the research explores how simplified strategies may boost short-term satisfaction while eroding long-term choice quality (**H6**), with **H7** testing the comprehensive moderating-mediating role of technology delegation in this process.

Methodology:

This Critical Realist study adopts a Sequential Explanatory design. Phase 1 (quantitative) tests TTD as a moderator between time-pressure and choice strategies through a survey instrument. Phase 2 (qualitative) semi-structured interviews explore the cognitive and psychological processes underlying delegated decision-making, providing deeper insights into exogenous cognition.

Originality and Value:

The study redefines AI as "exogenous cognition," exploring how technological delegation reshapes how consumers internally process and navigate intense temporal constraints. It fills a critical gap by demonstrating how TTD can potentially decouple the traditional link between situational time-pressure and suboptimal choice quality. By integrating Hyperbolic Discounting (Laibson, 1997; Ren & Huang, 2017) with Cognitive Offloading Theory (Jose et al., 2025), and drawing on recent work on human–XAI symbiosis (Litvinova et al., 2024) and dual-process frameworks (Hochman, 2024), this research offers a novel "Temporal-Cognitive" model that accounts for the emergence of the "hybrid consumer" in high-speed digital environments.

Theoretical & Practical Applications

The research refines Information Processing Theory by introducing "surrogate systems" as a multi-dimensional moderator, extending the Extended Mind Thesis into the domain of behavioral economics and consumer choice strategies. Practically, it provides detailed guidance for AI developers to shift from "speed-centric" automation to "agency-preserving" design.

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SMES INVESTING IN CAUSE-RELATED MARKETING: AN SME-SPECIFIC FRAMEWORK FOR COMMERCIAL VALUE AND SOCIAL IMPACT

Dr Marlen Demetriou
School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Cause-Related Marketing, SMEs, brand differentiation, stakeholder engagement, social impact, nonprofit partnerships, consumer response, CSR

Introduction

Cause-related marketing (CRM) links a firm's market offer to a social or environmental cause through a visible purchase-related commitment. Although CRM is a well-established topic, recent reviews show that the literature still focuses mainly on consumer response and campaign effects, with less attention to the distinctive constraints and opportunities faced by small and medium-sized enterprises (Bhatti, Galan-Ladero and Galera-Casquet, 2023; Koushik and Sarkar, 2025; Stötzer and Kaltenbrunner, 2024).

Purpose

This paper develops an SME-specific framework for CRM design and evaluation. It addresses the following question: how can SMEs use cause-related marketing to create commercial value while maintaining credibility, operational feasibility, and measurable social impact?

Theoretical Background

The paper draws on stakeholder and signalling perspectives. From a stakeholder perspective, CRM can strengthen relationships with customers, employees, communities, and nonprofit partners when the cause is legitimate and aligned with firm values. From a signalling perspective, CRM works only when the commitment is clear, specific, and believable. Recent evidence also shows that CRM has positive effects on consumer responses, but these effects depend on campaign fit, transparency, and perceived sincerity (Schamp et al., 2023; Bhatti, Galan-Ladero and Galera-Casquet, 2023).

Methodology and Methods

The study adopts a conceptual, practice-oriented approach supported by six EU SME cases. Brewgooder links beer purchases to clean-water provision; Elvis & Kresse donates profits from its fire-hose collection to The Fire Fighters Charity; MUD Jeans combines its lease model with environmental restoration logic; Hydrophil links hygiene products with water-related giving through Viva con Agua; Too Good To Go uses food-rescue promotions with social benefit triggers; and Original Beans connects chocolate purchases to tree planting in origin regions (Brewgooder, 2023; Elvis & Kresse, n.d.; MUD Jeans, n.d.; BIO COMPANY SE, 2024; Too Good To Go, 2023; Original Beans, n.d.).

Main Findings and Contribution

Across the six cases, CRM appears most effective for SMEs when five conditions are present: strong cause-brand fit, a simple transaction rule, a credible social partner, transparent communication, and low executional strain. The cases also show that SMEs can adopt different CRM architectures, including percentage-of-sales donations, profit-share models, product-linked environmental commitments, and promotion-based trigger campaigns.

The paper contributes an SME-focused framework that shifts the discussion from whether CRM works in general to how it can be designed credibly under resource constraints.

Originality and Value

The paper adds value by translating CRM theory into an SME context. It argues that, for smaller firms, CRM should be treated as a structured marketing investment with measurable business and social outcomes rather than as an informal act of giving.

Research Limitations

The study is conceptual and illustrative. It does not test causal relationships with primary data.

Theoretical and Practical Applications/Implications

For managers, the paper offers a basis for low-cost CRM pilots that are visible, measurable, and operationally manageable. For researchers, it positions SMEs as a distinct CRM context in which local legitimacy, partner credibility, and resource constraints shape campaign outcomes.

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THE CONSEQUENCES OF US-IMPOSED ECONOMIC SANCTIONS: A SYSTEMATIC REVIEW, 2015-2025

Mergaliyeva, Liliya[1]

[1]The University of Law Business School, London, United Kingdom

Keywords: Sanctions, Systematic Review, Firm Adaptation, Governance, Non-market Strategy, Thematic Synthesis

Introduction

Economic sanctions have become the foreign policy instrument of choice for the United States in the twenty-first century. As of 2025, the United States Treasury's Office of Foreign Assets Control (OFAC) administers more than 30 active sanctions programs targeting countries, entities, and individuals across six continents, making the US the world's most prolific and consequential sanctions sender. Yet the scholarly literature on US sanctions remains characterised by fragmentation, methodological inconsistency, and unresolved contradictions.

Purpose, Aim and Objectives

The purpose of this study is to examine how sanctions work, on whom they work, and what working means in a complex interdependent global economy. Specifically, the study aims to explore the sender-country perspective with the organisational consequences of sanctions. The objectives of the study are to identify what does the existing high-quality literature reveal about the economic, financial, governance, and societal consequences of US-imposed economic sanctions.

Literature Review and Theoretical Framework

Scholarship on sanctions operate primarily at institutional and aggregate-outcome levels (Felbermayr et al., 2021). Institution-based view research has addressed the firm-institutional interface (Peng et al., 2009) but typically treats the institutional environment as a background condition rather than a dynamic system that firms and stakeholders actively reshape. Global value chain and supply chain disruption research has developed rich accounts of the network layer (Witt et al., 2023), and the weaponised interdependence literature has theorised how state coercion travels through global economic networks (Farrell and Newman, 2019). Figure 1

presents the framework, which integrates the reviewed evidence (Frynas et al., 2017; Lawton et al., 2013).

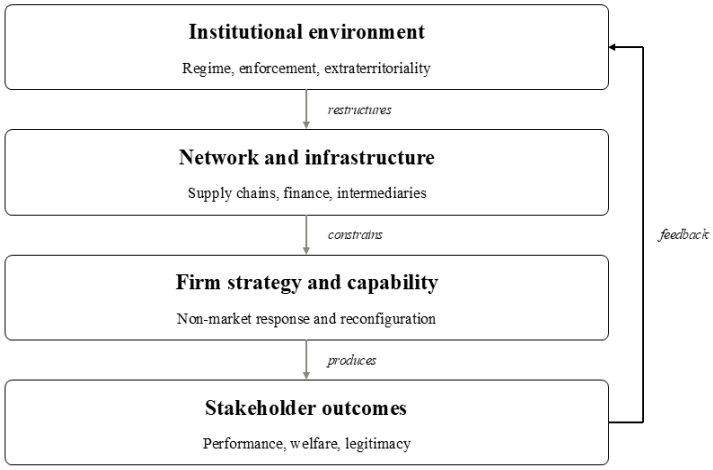


Figure 1: A multi-level non-market framework of economic sanctions

Methodology and Methods

This study employs a systematic review methodology. A search of the Web of Science returned 200 records, screened for inclusion in journals rated 3 or above in the AJG, ensuring the synthesised evidence base has itself passed rigorous peer review, yielding 77 studies for thematic synthesis.

Findings and Contribution

The thematic synthesis identified the following empirical themes: sanctions design, trade and macroeconomic consequences, financial systems, energy and resource markets, firm adaptation, and governance and stakeholder consequences. The study contributes to the growing literature by synthesising a fragmented body of research on how organisations respond to the coercive institutional environments created by US sanctions. It identifies the principal mechanisms through which sanctions influence firm behaviour, including regulatory exposure, reputational risk, financial restrictions, political uncertainty, and the extraterritorial reach of US enforcement.

Originality and Value

The originality of this study lies in integrating the sender-country perspective with the organisational consequences of sanctions within a contemporary international business context. This review centres on firms and other organisational actors, showing how sanctions reshape

strategic choices, cross-border operations, legitimacy pressures, compliance practices, market entry and exit, supply-chain configurations, and relationships with governments and stakeholders.

Research Limitations

Studies published in AJG 1- and 2-rated journals, specialist sanctions or regional outlets, interdisciplinary journals, books, policy reports, and other forms of grey literature were excluded.

Theoretical and Practical Applications and Implications

The review moves beyond treating firms as passive transmitters of state pressure. Instead, it conceptualises them as strategic actors that interpret, absorb, resist, and sometimes redirect the effects of sanctions. The resulting framework clarifies how organisational responses vary according to firm characteristics, industry exposure, institutional embeddedness, and relationships with sender, target, and third-country markets. In doing so, the study provides a foundation for future research on sanctions as coercive institutional environments and offers practical value for managers and policymakers seeking to anticipate the intended and unintended organisational consequences of economic statecraft.

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RELYING ON AI AGENTS: FREE CONSUMERS OR ALGORITHMIC PUPPETS?

Yaniv Gvili

School of Business Administration, Ono Academic College (OAC), Kiryat Ono, Israel.

Keywords: Marketing, Consumer Behavior, AI Agents, Artificial Intelligence, Consumer Autonomy.

AI agents increasingly mediate consumer shopping decisions in agentic commerce, where autonomous systems recommend, filter, or execute product choices on consumers' behalf. Yet, it remains unclear when consumers are willing to rely on AI agents, particularly when their design affects consumer autonomy. Drawing on Self-Determination Theory, we examine how the autonomy afforded by AI agents influences consumer reliance and how this effect depends on perceived consumer-AI goal alignment. Across three experiments (N = 694), autonomy affordance is manipulated by varying the number of options recommended by an AI agent. Results show that consumers rely more on AI recommendations when agents preserve decision autonomy. This effect is moderated by perceived goal alignment: when alignment is low (e.g., under sponsorship disclosure), autonomy-supportive design increases reliance, whereas the effect attenuates when alignment is high. These findings advance advertising research by identifying autonomy-supportive AI design and goal alignment as key drivers of persuasion in AI-agent recommendation contexts.

VC-BACKED INNOVATIVE COMPANIES: HOW TO FACE CHALLENGING TIMES

Smirne, Paolo-Maria[1]

[1]Department of Law, Economics and Humanities, École Supérieure de Commerce de Paris, Turin, Italy

Keywords: Venture capital, Corporate governance, Shareholder rights, Articles of association, Transaction costs.

Abstract

Multiple factors must be brought together in order to achieve innovation: although scientific and organisational aspects often come to mind first, the company's legal architecture also plays a relevant role. The aim of my research therefore is to analyse some of the clauses most commonly used in VC-backed companies, in order to conclude that careful structuring of the company's articles of association can work as an effective tool to manage agency conflicts between outsiders (i.e. potential investors) and insiders (i.e. already existing shareholders, mainly founders), thus fostering the company's growth (Chaim and Eckstein, 2024). Two groups of clauses will thus be analysed: those directly shaping investors' rights and those shaping them indirectly, by limiting the rights of the founders.

A first group of clauses, which can foster efficiency in innovative companies, directly shapes investors' rights. This concerns the creation of special classes of shares, i.e. shares whose attached rights are tailored to meet some of the specific needs of venture capitalists. Three areas are especially significant in this respect: governance rights, economic rights and share transfer restrictions.

As for the first area (governance rights), venture capitalists often face a dilemma. On the one hand, their shareholding does not allow them to control the company they invest in; on the other hand, they contribute resources that require monitoring of how those resources are used. One possible response lies in strengthening their voice rights within the company, by granting enhanced voting rights to VC shares. Three types of clauses may be considered.

First, voting rights may be structured so as to reconcile a minority stake in the share capital with a significant weight in the company's decision-making process, thereby enabling investors to monitor the use of the financial resources they have provided. In other words, transaction

costs may be reduced by granting an investor, holding 20% of the share capital, 40% of the voting rights (Bini, 2024; Lamandini, 2024). Secondly, the number of votes in the general meeting (GM) may again be decoupled from the percentage of share capital owned by the investor by granting a veto right over decisions that are key for the protection of the investment. In this way, a minority investor becomes necessary for the adoption of certain resolutions that could adversely affect its position (typically: M&A, the sale of strategic assets or the admission of new investors). Thirdly, certain decisions may be removed from the vote of the GM and placed directly in the hands of the investor. This includes shares granting the right to sit on the Board of Directors, or to appoint one of its members: thus, ensuring that a minority investor has an adequate voice in the management of the resources it has contributed.

As for the second area of interest (economic rights), the number of share configurations typically adopted is, once more, three. First, venture capitalists often seek to protect their investment by decoupling the percentage of their economic rights from that of the share capital they hold: an investor holding 20% of the share capital may f.i. wish to participate in profit distributions on a 30% basis. Secondly, investors may want dividend distributions to be configured as an entitlement for the holders of a special class of shares: ordinarily instead, profits are not distributed unless the general meeting (GM) so decides. Thirdly, in the event of winding-up (or other liquidity events, such as the listing of the company or the sale of its assets), venture capitalists—consistent with their mission of pursuing the highest possible return in exchange for their willingness to undertake risky investments—often seek "liquidation preference" clauses (Maugeri, 2024). These provide investors with a preferential return, realigning the interests between investors and founders and thereby helping to mitigate asymmetric access to corporate information between the two groups (Gilson, 2003; Giudici et al., 2022). In European continental legal systems, however, such provisions must be reconciled with a higher level of mandatory rules than is typical in common-law systems (D'Alessandro, 2003; Giudici and Agstner, 2019; Tosch Hoggatt et al., 2026): this mainly concerns the prohibition of so-called "leonine" clauses (i.e. no shareholder may be entirely excluded from profits or losses).

As for the third area of interest (share transfer restrictions), two types of clauses are widely used in VC-backed startups (Dentamaro, 2022). The "tag-along" clause once again realigns the investors' interests with those of the founders by allowing venture capitalists to benefit from the same disinvestment conditions negotiated by the majority shareholders. That said, the "drag-along" clause can also be perceived as a way to strengthen the position of investors: the

fact that minority shareholders (such as the venture capitalists) may be forced to disinvest by the majority ensures that no minority shareholder will be able to veto a favourable deal.

A second group of clauses, which can also foster efficiency in innovative companies, indirectly shapes investors' rights by limiting the typical rights of the founders. This occurs in two main ways.

First, founders often agree to demonstrate their commitment to the business venture by subjecting their shares to lock-up clauses. The rationale is twofold: on the one hand, startups without the founders' input could easily turn into empty shells; on the other hand, the founders' continued involvement in the company for at least a certain period provides reassurance to investors as to the reliability of the business (i.e. if insiders believe in it, outsiders may be more willing to do so themselves).

Secondly, should the founders leave the company, exit provisions may help facilitate the process. It is reasonable to distinguish between an agreed exit and an unplanned exit. In the first case ("good leaver"), the valuation of the departing founder's shares will be calculated according to criteria favourable to the leaver; in the second case ("bad leaver"), the founder will have to pay for the value they are extracting from the company. Once again, these clauses promote efficiency by discouraging opportunistic behaviour.

Economic theory suggests that the more effectively the investors' and founders' expectations are aligned, the more resources can be devoted to fostering the company's development rather than to managing tensions among shareholders. This abstract therefore concludes that provisions tailored to the needs of venture capital investors can reduce transaction costs for prospective outside investors, thereby ultimately supporting the company's success and growth, even in the current turbulent economic environment.

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COMMERCIAL RESILIENCE IN THE POLYCRISIS ERA: HOW FORWARDERS RETAIN CLIENTS THROUGH COMMUNICATION, TRUST, AND STRATEGIC PARTNERSHIPS

Meneses, Raquel[1,2] Brito, Pedro Quelhas[1,2] Nogueira, Alexandra[1]

[1]School of Economics and Management, University of Porto, Porto, Portugal

[2]INESC TEC - LIAAD - Institute for Systems and Computer Engineering, Technology and Science, University of Porto, Porto, Portugal

Keywords: Crisis Management, Freight Forwarding Industry, Communication Strategies, Trust, Relational Governance, Supply Chain Resilience, Strategic Partnerships, Uncertainty Absorption

Abstract

Freight forwarding companies play a crucial role in the global economy, moving large volumes of products, supporting exports and imports, providing shipping advice, packaging, and other logistics services. In recent years, this sector has faced many barriers due to natural disasters, pandemics, and geopolitical decisions. The research aimed to investigate the commercial strategies freight forwarders use to retain clients during market crises. This study employs a qualitative research design and uses semi-structured interviews. Data were collected from two complementary perspectives: commercial professionals from the freight forwarding industry and client representatives from multinational firms reliant on global logistics services. The analysis of the qualitative data has yielded several key findings that, taken together, illustrate a fundamental transformation in the industry's commercial approach, driven by a new reality of systemic and perpetual instability. Communication has emerged as the single most critical factor for client retention, extending beyond mere logistical updates to a transparent, consistent, and truth-based approach. Crises act as catalysts, accelerating the evolution of the client-forwarder relationship into a strategic partnership. Technology complements human relations, not substitutes for them. Moreover, finally, the recent disruptions have spurred a strategic imperative to build greater resilience. This is manifested in a client-driven shift from "just-in-time" to "just-in-case" inventory strategies, the implementation of active backup forwarder scenarios, and an increased demand for forwarders to enforce greater accountability from ocean and air carriers. becomes the primary source of differentiated value and client retention.

Introduction

In recent years, the global business environment has become increasingly unpredictable. Events such as the COVID-19 pandemic, geopolitical instability[1], the blockage of the Suez Canal, and labor strikes at major ports have created widespread disruptions with cascading effects across international trade. These developments highlight the fragile nature of global supply chains and the growing importance of managing client relationships under conditions of persistent uncertainty.

Freight forwarding companies play a crucial role in the global economy, supporting international trade through a wide range of services, including export and import coordination, shipping advisory, packaging, and other logistics services. Despite their central position in supply chains, the sector is particularly exposed to volatility, as it depends heavily on external actors, such as carriers, regulators, and geopolitical conditions. In times of crisis, this exposure is amplified, challenging the ability of firms not only to deliver operational performance but also sustain client relationships.

In such contexts, traditional commercial models, often based on stable demand, long-term contract, and price competitiveness, become increasingly fragile. Market disruptions frequently lead to contractual breakdowns, capacity shortage, and extreme price fluctuation, creating uncertainty for both service providers and clients. As a result, the commercial interface emerges as a critical site where uncertainty is managed, expectations are negotiated, and relationships are either reinforced or weakened.

Recent literature suggests that in environment characterised by “polycrisis”, firms rely on relational mechanisms, such as trust, communication and cooperative governance, to maintain business continuity and absorb uncertainty. However, while prior studies emphasise the importance of these concepts, there is limited empirical understanding of how they are operationalised at the commercial level, particularly in highly volatile, business-to-business service contexts such as freight forwarding.

To address this gap, this study focuses on the role commercial professionals in managing client relationships during crisis situations. In particular, it builds on the notion of uncertainty absorption, understood as the process through which actors interpret and translate ambiguous

[1] It is important to note that this research was conducted prior to the recent escalation involving the United States, Israel, and Iran, as well as the temporary disruption in the Strait of Hormuz. These developments have only reinforced the relevance and urgency of the issues examined in this study, further highlighting the persistent fragility of global logistics and commercial relationships.

information into actionable knowledge for others, and examines how this mechanism is enacted in client-facing interactions.

Accordingly, the study addresses the following research question: How do commercial professionals in freight forwarding act as uncertainty absorbers to sustain client relationships during market crises, and which relational mechanisms underpin effective client retention.? To answer this question, the study adopts a qualitative research design based on semi-structured interviews with two complementary groups: freight forwarding professionals and clients representatives from multinational firms. This dual-perspective approach enables a nuanced understanding of both the strategies employed by forwarders and the expectations and evaluations of clients during periods of market instability.

By focusing on the commercial interface and integrating insights from both sides of the relationship, this research contributes to the emerging discussion on client retention under conditions of systemic volatility. It also, provides practical implications for firms seeking to enhance resilience, build trust, and redefine value in an increasingly unstable global logistic environment.

Literature Review

The literature on client retention under crisis conditions spans several interconnected domains, including uncertainty management, relational governance, crisis communication, and supply chain resilience. While these streams have evolved largely in parallel, they collectively suggest that maintaining interorganizational relationships in volatile contexts dpends less on transactional mechanisms and more on relational and interpretive capabilities. This section reviews these perspectives to build an integrated framework for understanding client retention in freight forwarding under conditions of systemic instability.

Crises, uncertainty, and relational dynamics in interorganizational contexts

Nowadays, the competitive environment is not a sequence of isolated events but an interlinked set of crises that combine fast-moving triggers with slow-moving stresses, generating cascading effects across systems. Consequently, governance, trust, and communication shift from routine capabilities to everyday mechanisms of uncertainty absorption in B2B relationships (Lawrence et al., 2024; Liu and Renn, 2025). In such volatile contexts, client retention and business continuity depend on relational mechanisms, including trust (affective and competence-based commitment, perceived justice, and interdependence), which complement contractual safeguards. Environmental uncertainty and perceived risk increase the need for relational governance (cooperative norms, joint problem solving), while asset specificity and power

asymmetry warrant contractual safeguards; in practice, contractual and relational governance are complementary, and trust moderates the link between contextual factors and governance choice (Bonatto et al., 2022).

These relational governance mechanisms are particularly critical in crisis contexts, where formal contracts become less reliable and informal coordination mechanisms gain prominence. Crisis-management literature underscores that, in overlapping and unscheduled events, proactive, transparent, and timely communication is pivotal to uncertainty reduction, expectation anchoring, and accountability towards partners and clients; in public–private networks, collaborative governance and reconfiguration capacity emerge as resilience practices in the polycrisis era (Durugbo and Al-Balushi, 2022; Keinänen et al., 2026). This highlights the role of communication not only as an information-sharing tool but as a core mechanism through which commercial actors manage expectations and sustain trust during disruptions.

In complex services, analyses of interorganizational trust reveal that service innovation and digital platforms yield performance only when anchored in trust, agency, and coordination norms, reinforcing the centrality of relational mechanisms in high-risk contexts (He et al., 2022). In supply chains, key operant resources (information sharing, governance form, relation-specific resources, trust, relational commitment) outline distinct value-generation pathways. This helps reinterpret market shifts amid volatility: value is progressively reweighted from 'price' to 'resilience', i.e., the partner's capacity to absorb uncertainty and ensure continuity (Jaakkola et al., 2024; Rodríguez-López and Coronado Mondragon, 2024).

In polycrisis, client retention in B2B services is less a function of rates and more a function of relational capacity (trust, communication, coordination) and governance architectures that absorb uncertainty. While these dynamics are observable across several industries, they become especially pronounced in logistics contexts that are highly exposed to global shocks. This study maps, from two complementary perspectives (freight forwarders and clients), which commercial and relational practices sustain trust and continuity during crisis periods, advancing the conceptualization of the commercial professional as an 'uncertainty absorber.'

In this context, communication and relational mechanism can be understood as forms of uncertainty absorption, as they enable the translation of ambiguous and rapidly changing conditions into actionable knowledge for clients.

Market crises in the freight forwarding industry

Economic recessions often trigger widespread market crises in the freight forwarding industry. Freight forwarders face diminished revenue streams as shipping lanes see reduced activity and container utilization declines. Economic and geopolitical crises, conflicts, trade wars, and

regulatory shifts further complicate operations, as tariffs and sanctions force costly rerouting and renegotiation.

Beyond operational impacts, these disruptions strain relationships among forwarders, carriers, and clients, turning crises into critical tests of trust and partnership stability.

Recent literature on supply chain resilience emphasizes that firms now operate in an environment shaped by high levels of uncertainty, complexity, and risk. Shi et al. (2024) highlight that global supply chains face structural challenges resulting from increased geographic dispersion, recurrent disruptions, and unpredictable shocks that affect coordination and material flows. Their analysis shows that, under these conditions, volatility and risk exposure become central features of supply chain functioning, demanding strengthened resilience mechanisms and enhanced capacities for adaptation, alignment, and responsiveness. More specifically, Bai et al. (2022) identify volatility as a core characteristic of the freight forward industry. Large corporations are aware of these factors but are often poorly equipped to monitor, manage, and understand volatility, especially the unique volatility in the freight sector, which impacts their balance sheets through the movement of goods to market. Analysts are not equipped with detailed, in-depth freight industry experience, nor are they given the luxury of time to comprehend how the complexity of elements that impact a forwarder's performance, balance sheet health, and insurance needs have interacted, are interacting, or are forecast to impact a given timetable of projected events.

The commercial perspective highlights a trend toward integrated solutions and the critical importance of trust; the commercial relationship is the nexus where crisis impacts are felt most acutely and where retention is ultimately won or lost. However, while the literature acknowledges the importance of trust (Prakash et al., 2022), it offers limited empirical guidance on how to build and sustain trust amid operational chaos and contractual breakdowns.

In any business, establishing and maintaining customer trust and loyalty is crucial. However, since trust is not easily quantifiable and its evaluation is subjective, many professional organizations overlook the development and reinforcement of uniform guidelines for all employees. The higher the volume of services, the greater the likelihood of problems, errors, and disputes arising. A key takeaway is that trust levels can and should be enhanced to improve overall business efficiency. The foundation of a trustworthy corporate system lies in a well-coordinated, well-trained team that possesses a deep understanding of the boundaries within which employees operate in a supportive environment at all levels (Prakash et al., 2022).

Thus, a clear gap exists in the literature: a lack of in-depth research from both the forwarder and client perspectives on the specific commercial strategies that are effective in a perpetual

uncertainty environment. We aim to address this gap by exploring real-world techniques, successes, and failures in client retention, moving beyond theoretical models to provide a practical understanding of the commercial approach in today's volatile freight-forwarding industry.

Taken together, the reviewed literature suggests that client retention in crisis contexts is shaped by a combination of relational governance mechanisms (e.g., trust, cooperation), communication practices (e.g., transparency, timeliness), and the ability to manage uncertainty through interpretation and coordination. However, these dimensions are typically examined in isolation, with limited attention to how they interact at the commercial interface. In particular, there is a lack of empirical understanding of how commercial professionals enact these mechanisms in practice and how clients perceive their effectiveness. This gap motivates the present study, which adopts a dual-perspective approach to examine how these elements converge in shaping client retention during market crises.

Methodology

The methodology for this study is qualitative with primary data collection through semi-structured interviews. The primary objective is to explore the nuances of commercial strategies, client relationships, and decision-making processes during volatile periods, where context and perception are paramount. Data collection took place in early 2025, during a period characterised by ongoing instability in global logistics markets. The data were collected through 15 semi-structured interviews with SMEs (Subject Matter Experts): 10 from the freight forwarding industry and 5 clients. This dual approach was chosen to ensure a comprehensive understanding of both the industry's internal strategies and external customer experiences during market disruptions. The SMEs selected possess significant depth of experience, ranging from 5 to over 30 years in the sector, with the majority having at least 10 years. The client participants all represent large, multinational corporations, providing a strategic perspective from major global shippers who are critically dependent on their logistics partners. This dual-method approach enriches the study by revealing both the efficacy of commercial strategies and their real-world impact, offering actionable recommendations for the industry. The responses were transcribed, and key concepts, terms, and strategies were coded and organized into themes. Thematic analysis helps categorize the data and make sense of complex responses. It allows the identification of patterns related to market disruptions, crisis management, and client expectations.

Findings

The anatomy of Crisis Redefining the operational landscape

The breakdown of these established commercial norms is a critical finding. An SME explained that pre-COVID, the industry operated on "long-term contracts," but during and after the pandemic, these agreements "were thrown to the trash" as a force majeure environment took hold. A client-side manager described the tangible impact of this shift, stating that during a crisis, "All our agreements are more or less no longer respected from one day to the other... we are basically fully lost control". This contractual unreliability forces a move towards more dynamic, spot-market-driven interactions, which, while necessary, creates immense instability for clients' budgeting and planning. Consequently, the actual commercial challenge is not merely managing a single crisis but redesigning the entire commercial framework to function effectively amidst perpetual instability. This implies a strategic move away from price-centric agreements towards partnerships built on different value metrics, such as flexibility and resilience.

Crises function as a "litmus test" for client-forwarder relationships. They are powerful catalysts that either solidify a partnership by demonstrating value beyond price or expose its transactional weaknesses, often leading to its dissolution. One SME articulated this duality with clarity, stating that a crisis is an "opportunity" to "find great solutions, and there will definitely support the relationship, and it will be at the end much stronger than before. Or in the worst case, you can fail". Another SME reinforced this, noting that during a crisis, one could "build an... even stronger relationship with the customer because at the end it is a situation in which you have to deal with... Or you could completely destroy it". This aligns with Al-Dabbagh (2020), who observes that crises require structured decision-making processes, with rapid assessment, scenario evaluation, and strategic response. Although this work focuses on governmental crisis decision-making, the underlying principle that crises impose heightened cognitive and strategic demands on decision-makers applies to commercial settings as well. The outcome is not just operational but deeply interpersonal, impacting long-term business viability in a way that general frameworks often overlook.

The commercial response: a framework for client retention

The analysis of the interview data reveals a clear and consistent framework for success, moving from traditional, price-focused sales tactics to a relationship-centric, solution oriented approach in which communication, partnership, and flexibility are paramount.

Communication as the cornerstone of crisis management

Across all interviews, with near-unanimous consensus from both firms and clients, proactive, transparent, and reliable communication was identified as the single most critical factor for client retention during a crisis. It is the foundation upon which trust is maintained, and partnerships are preserved when operational stability falters. This finding strongly confirms the theoretical importance of communication in crisis management frameworks (Al-Dabbagh, 2020). Our data extends this theory by demonstrating that the quality and timeliness of communication (proactivity, honesty) are valued more highly than its positive or negative nature. This positions the commercial role not just as a communicator, but as a manager of uncertainty, a practical application that enriches the theoretical models.

From service provider to strategic partner

The intense pressures of market crises accelerate the evolution of the client-forwarder dynamic. The interviews show a clear trend away from transactional, price-based relationships towards strategic partnerships built on mutual trust, reliability, and a shared problem-solving ethos. Forwarders who successfully navigate this transition are far more likely to retain and even grow their business with key clients.

Clients explicitly prefer this partnership model. One procurement manager advises other businesses to "stick to our partner, and I'm using the word partner. Yeah, the service provider". Another client explains the benefits of this approach: "This is a cooperation, and if you have a good relationship and a good cooperation, it is also easier to get that hands-on feeling and that you are being prioritized". Successful firms have internalized this and view partnership-building as a long-term strategy that pays dividends during volatile periods. One account manager described his approach as looking at relationships "in a longer term. So mid to longer term, so even 5 to 10 years," moving beyond the short-term focus of the RFQ cycle. At the core of this partnership is a fundamental shift towards a solution-oriented mindset. Clients are less interested in a forwarder's standard service portfolio and more interested in their ability to solve complex, unforeseen problems. As one client bluntly stated, "What I want is a solution. A Person with solutions, not someone who wants to make more sales".

This shift has fundamentally redefined the concept of "value" in the commercial relationship. Before the constant state of crisis, value was heavily weighted towards price and cost savings. The interviews reveal that while cost remains a factor, its primacy has been usurped by metrics of resilience and reliability. Clients who previously might have switched providers for minor price differences now recognize the immense cost of a line-down situation or a failed delivery.

As the client-side procurement manager noted, businesses that are purely opportunistic and "jump" between forwarders for small savings are at a significant disadvantage during crises. They prioritize forwarders who demonstrate accountability and a willingness to "fight for us in these challenging times". This means a forwarder who can secure scarce capacity (even at a premium price) or propose a viable alternative routing provides far more value than one who offers the lowest theoretical rate on a contract that ultimately cannot be honored. The implication for commercial strategy is profound: sales and account management teams must shift their value proposition from "we can save you X% on your freight spend" to "we can help guarantee your production line keeps running." This requires a much deeper engagement with the client's business. The commercial role thus evolves from a service vendor to a strategic supply chain consultant.

This empirical evidence confirms the strategic importance of "Collaboration and Partnerships" and builds upon the concept of trust (Prakash et al., 2022). Our data extends these ideas by showing how this partnership materializes in a crisis: through a tangible shift in the value proposition from cost-saving to ensuring business continuity.

Strategic flexibility: adapting pricing, services, and operations

In a volatile market, rigidity is a liability. Successful freight forwarders demonstrate a high degree of strategic flexibility, adapting their pricing models, service offerings, and operational approaches to meet the unique and rapidly changing challenges of a crisis. This adaptability is a key component of the solution-oriented mindset that clients value.

Pricing becomes a dynamic and often transparently negotiated element. SMEs acknowledge that crises inevitably lead to higher interest rates. However, they frame this not as opportunistic price gouging, but as a necessary measure to secure scarce capacity in a highdemand market. One SME recalled that during the Icelandic volcano crisis, they "could increase the rates to a very interesting level," which was essential to chartering aircraft for a key automotive client and keeping their production lines moving. Another described a strategy of maintaining a base contract rate but adding a clearly communicated "emergency freight add-on," which provides a degree of transparency and predictability for the client even amidst volatility.

Another SME described a strategy of providing additional warehouse space or leveraging Free Trade Zones to help clients manage inventory and mitigate the impact of tariffs, allowing them to "decide on a shorter notice then and where the cargo goes... you have to pay that is similar to what I mentioned earlier regarding a bonded warehouse. This helps the customer to steer it a little bit". These actions demonstrate a willingness to move beyond a standard service menu and

co-create solutions with the client, cementing the partnership. These findings provide concrete examples of "adaptability" crucial for handling crises (Shi et al., 2024). The diversification of services and operational approaches aligns directly with the mitigation strategies proposed by Margherita and Heikkilä (2021), demonstrating how these theoretical strategies are implemented in practice to maintain supply chain integrity.

The human-technology nexus in crisis management

The data provide a nuanced perspective on the roles of human expertise and technology in the freight forwarding industry. While technology is recognized as an increasingly important enabler of efficiency and visibility, the data overwhelmingly indicates that the human factor (relationships, expertise, creative problem-solving, and communication) remains the decisive element in successfully navigating crises and retaining clients.

Technology's primary value lies in providing data, visibility, and efficiency. Clients appreciate digital tools that give them direct access to information, such as "predictive ETA" platforms that offer a "live view of where cargo is at", and online portals that provide daily updates without clogging email inboxes. Firms, in turn, see the value in "more automated messages" that provide faster alerts to clients about deviations, delays, or rollovers.

However, participants are keenly aware of the limitations of technology. A significant concern is the data's reliability. As one client pointed out, digital platforms are only as good as the information fed into them: "You are depending on human beings to input the data into these systems, and if they input it wrong, it's wrong". Another critical limitation is the lack of business context. A different client noted that while technology can provide data, it cannot understand its significance: "They don't know what is important for me or for us." This leads to a clear delineation of complementary, rather than competitive, roles for humans and technology in crisis management. Technology is best suited for information dissemination: tracking shipments, providing status updates, and reporting raw data. It answers the fundamental questions of "what" and "where." In contrast, humans are essential for interpreting information, providing context, and offering reassurance. They answer the more critical questions: "so what?" and "now what?" For example, a system can report that a container has been delayed by five days. A human account manager, knowing the client's production schedule, can interpret that this delay will shut down a critical assembly line and can proactively begin developing alternative solutions.

As one firm noted, a client "just wants the reassurance to speak to somebody else". This reassurance, born of trust and expertise, cannot be automated. The most effective commercial

approach, therefore, is one that integrates both elements. It leverages technology to deliver fast, accurate data, freeing up human account managers to focus on high-value activities, such as interpreting that data within the client's specific context, developing creative solutions, managing the relationship, and providing the essential human touch that builds lasting partnerships. This finding offers a nuanced counterpoint to the literature's strong emphasis on "Technology Adoption". While our data confirms that technology is a key tool, it suggests its role is primarily supportive rather than transformative in client retention during a crisis. This extends the discussion by delineating complementary roles: technology for information dissemination and humans for interpretation, strategic action, and reassurance—a critical distinction not explicitly detailed in the reviewed literature.

Building future resilience: strategic imperatives for the industry

The experience of recent, frequent, and overlapping crises has catalyzed a strategic shift within the supply chain community towards building greater resilience. The interviews suggest that the sector is shifting from a pure cost-optimization model to strategies that build buffers, options, and flexibility to withstand future shocks better.

A key theme is the move from "Just-in-Time" to "Just-in-Case" logistics. The hyper-efficient, low-inventory models that dominated for decades have been exposed as fragile. A firm advocated for a fundamental change in mindset, industry needs to build "buffer, the setup of the company... for people for operational stuff, but also for goods for spare parts". Clients themselves are driving this shift. A global logistics director noted that "many companies started to increase their inventories for both raw materials components and also for the finished goods... making their own warehousing" to generate agility and avoid being out of stock. For clients, a primary resilience strategy is diversifying their forwarder portfolio by implementing active backup scenarios. This marks a significant change from past practices. The new strategy is to "prepare more backup scenarios" and "keep backups running so that they really can take over if needed," even if this approach is "more expensive in rates" and more complex to manage. Having a secondary or tertiary partner already familiar with the business's volumes and requirements enables a much faster, more effective pivot when a crisis compromises the primary provider, whether a port strike or a cyberattack.

This finding is a direct, practical manifestation of the risk management principles discussed in the literature. The move from "Just-in-Time" to "Just-in-Case" is a clear response to the heightened volatility (Bai et al., 2022; Shi et al., 2024). The client-driven strategy of

diversifying the forwarder portfolio with active backups is a tangible application of the resilience strategies (Peters et al., 2023), reinforcing scenario planning and stress testing.

Finally, there is a clear imperative from the client side for forwarders to exert more influence upstream and drive greater accountability from carriers. Given that contracts are frequently dishonored during crises, clients expect their forwarder partners to leverage their consolidated volume and relationships to protect their interests. As one client stated, forwarders have "better negotiation power with the shipping lines, and they should somehow force shipping clients to stick to the agreements". The breakdown of this "trust circle" is seen as a significant threat to supply chain stability, and clients view their forwarders as the key agents in restoring a degree of reliability and predictability to the carrier market. This places a new strategic demand on forwarders: their value is not just in executing shipments, but in actively managing and stabilizing their corner of the supply chain ecosystem. This introduces a new dimension to the "Collaboration and Partnerships" theme, extending the concept beyond the client-forwarder relationship to include the forwarder's responsibility in managing the broader supply chain ecosystem, a point not explicitly covered in the reviewed literature.

Conclusion

The research aimed to investigate the commercial strategies freight forwarders use to retain clients during market crises. The analysis of the qualitative data has yielded several key findings that, taken together, illustrate a fundamental transformation in the industry's commercial approach, driven by a new reality of systemic and perpetual instability. First, the operational context for freight forwarding has undergone a fundamental shift. The empirical data confirms that the industry has moved beyond managing occasional, discrete crises to navigating a state of perpetual and overlapping "multi-crisis". This environment of pervasive uncertainty, characterized by the volatility described in the literature, has rendered traditional commercial models based on long-term, fixed-rate contracts increasingly ineffective.

Second, in this volatile environment, proactive, transparent, and reliable communication has emerged as the single most critical factor for client retention. The role of communication extends beyond mere logistical updates; it serves as a vital tool for reducing uncertainty, managing expectations, and demonstrating accountability. This finding provides a robust, real-world validation of theoretical crisis management frameworks that emphasize the importance of clear communication policies for organizational response. The consistent client demand for unvarnished truth underscores that the quality and timeliness of communication are more valuable than the positive (or not) nature of the information itself. Third, crises act as catalysts,

accelerating the evolution of the client-forwarder relationship into a strategic partnership. The definition of value has shifted from a primary focus on price to a new emphasis on reliability, flexibility, and solution orientation. This extends the existing literature on the importance of trust and collaboration in logistics, illustrating how these abstract concepts manifest during a crisis. Clients are increasingly prioritizing forwarders who demonstrate a deep understanding of their business and act as problem solvers, a trend that reflects the industry's shift toward more integrated, 4PL-style service offerings.

Third, while technology plays a crucial enabling role in providing visibility and efficiency, the human factor remains the decisive element in crisis management and client retention. Data clearly delineates complementary roles: technology is best suited for information dissemination (e.g., tracking data), while humans are essential for information interpretation, contextualization, and the reassurance that builds and sustains trust. The most effective commercial approach is one that leverages technology to free up human capital for high-value relationship management and creative problem-solving.

Finally, the recent disruptions have spurred a strategic imperative to build greater resilience. This is manifested in a client-driven shift from "just-in-time" to "just-in-case" inventory strategies, the implementation of active backup forwarder scenarios, and an increased demand for forwarders to enforce greater accountability from ocean and air carriers. This trend is a direct, practical application of the risk management principles and scenario planning, signalling a broader strategic realignment in global supply chain management. Beyond extending existing theories, this study makes several original contributions to the field. It articulates a critical shift in the definition of value in the client-forwarder relationship, moving away from price-centric metrics toward a new paradigm where reliability and solution orientation are paramount. The research also conceptualizes a new role for the commercial professional as an "uncertainty absorber", highlighting their function in processing chaotic information to provide clients with the clarity needed for strategic decision-making. During a crisis, the primary function of the account manager is not merely to communicate information but to process, interpret, and contextualize chaotic data streams, thereby absorbing market volatility on behalf of the client and enabling them to make strategic decisions. Finally, this study contributes a nuanced understanding of the human-technology nexus in crisis management, delineating the complementary roles where technology is commoditized for data dissemination. At the same time, human expertise in interpretation, creative problem-solving, and reassurance becomes the primary source of differentiated value and client retention.

The findings of this study have significant, actionable implications for commercial leaders and managers in the freight forwarding industry. To succeed in the current market, a strategic reevaluation of the commercial function is necessary, moving it beyond a traditional sales role to become a central pillar in the organization's resilience strategy.

Beyond the firm level, these findings signal a systemic transformation in freight forwarding's business model, with broader implications for the global economy. The industry appears to be moving from a transactional, cost-plus service model to one more akin to a strategic consultancy, where value is derived from knowledge, flexibility, and risk management. This shift positions the commercial professional not as a salesperson but as a risk-management consultant for the client's supply chain. The shift from "just-in-time" to "just-in-case" logistics, with the prioritization of resilience over pure cost efficiency, suggests a fundamental change in global supply chain strategy. Industries are beginning to internalize the high costs of disruption, leading to more robust, albeit potentially more expensive, supply networks. This trend could influence macroeconomic models by placing a higher premium on stability and predictability, potentially creating inflationary pressures as redundancy is built back into lean systems, but also yielding economic benefits through increased stability and reduced losses from disruptions. For the freight forwarding industry, this represents a historic opportunity to evolve from a commoditized service provider into a strategic enabler of global trade resilience, fundamentally elevating its role in the world economy.

While this study provides valuable qualitative insights into its chosen topic, it is important to acknowledge its limitations. The primary limitation is the limited sample size. While the interviews with 15 participants provided unparalleled depth and nuance, the findings are based on a small, purposively selected sample. They may not be generalizable to the entire freight forwarding industry. Furthermore, the sample was composed primarily of experienced professionals and large multinational corporations, with a focus on Europe and North America. The perspectives of small and medium-sized enterprises (SMEs) or those operating predominantly in other economic regions may differ significantly.

Future research should seek to test the hypotheses generated by this study. A large-scale survey could be distributed to a broader, more diverse sample of freight forwarders and shippers worldwide to assess the statistical correlation between specific commercial strategies (e.g., communication frequency and transparency) and client retention rates during a documented crisis period. As an extension of the first research avenue, a dedicated study should explore the development and viability of new contractual models grounded in shared risk and resilience

metrics. This could involve a comparative analysis of emerging contractual frameworks (e.g., gain-sharing agreements, resilience-based Service Level Agreements) and their impact on client-forwarder collaboration and performance during disruptions. This study found that technology is currently used more for visibility than for proactive solutions. Future research could focus specifically on the impact of advanced Artificial Intelligence and predictive analytics on crisis response. A comparative case study of firms that have heavily invested in these technologies versus those that have not could yield valuable insights into their effectiveness in anticipating disruptions, optimizing responses, and potentially automating some of the "uncertainty absorption" functions currently performed by humans. Flowing directly from this study's strong emphasis on the "human element," future research could explore the specific leadership qualities and human capital development strategies that foster organizational resilience. This could involve case studies on training programs, leadership styles, and corporate cultures that empower commercial teams to act as effective "uncertainty absorbers" and strategic consultants, as clients now demand.

In conclusion, this research confirms that the freight forwarding industry has entered a new paradigm defined by constant crisis. The findings demonstrate a clear and fundamental shift in the commercial landscape, where success is no longer solely dictated by price, but by a sophisticated blend of resilience, strategic partnerships, and transparent communication. While technology serves as a vital enabler, the human element, embodied by the commercial professional acting as a trusted advisor and "uncertainty absorber", has proven to be the decisive factor in navigating this new reality. The strategies identified herein are not merely tactics for surviving the next disruption; they represent the new standard for commercial excellence and the foundation for building lasting, resilient client relationships in a permanently volatile global market.

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INTRADAY IMPLIED VOLATILITY SURFACE FORECASTING IN CRYPTOCURRENCY OPTIONS MARKETS

Elnur Namazov[1], Balázs Králik[2], Vilayat Valiyev[1], Kata Váradi[2]

[1] Azerbaijan Technical University, Baku, Azerbaijan
[2] Corvinus University of Budapest, Budapest, Hungary

Keywords: Implied volatility, Volatility smile, Bitcoin options, High-frequency forecasting, HAR model, Deribit, Tail risk.

Introduction and Research Question

Cryptocurrency options markets have grown rapidly, with Deribit the dominant venue for Bitcoin options. Trading is continuous (24/7), generating dense intraday quote streams without overnight gaps. Volatility forecasting is central to option pricing, hedging and risk management, yet the literature has focused overwhelmingly on realised volatility [1]. The dynamics of *implied* volatility (IV), and especially the *shape* of the IV smile, remain largely unaddressed in crypto markets at tick-level frequency. This study asks: *are intraday Bitcoin IV smile descriptors (Level, Skew and Curvature) forecastable beyond a random-walk benchmark, and how does forecastability vary across horizons?*

Conceptual Framework

The IV surface admits a parsimonious factor description [2], 2002): Level captures broad ATM uncertainty, Skew the relative pricing of downside versus upside risk, and Curvature the relative richness of the wings. These components should differ in predictability *ex ante*. ATM Level aggregates broad volatility expectations and is expected to behave near-efficiently [3]. Skew reflects segmented demand for downside protection that may adjust more slowly. Curvature reflects demand for convexity and tail protection together with dealer inventory and quote-depth constraints, and is therefore expected to be the most slowly adjusting component, particularly at longer horizons.

Data and Methods

We use tick-level Bitcoin option-chain data from Deribit (via Tardis.dev) spanning 20 December 2025 - 16 March 2026 (87 days, 25,038 5-minute bars). We restrict to a 14-30 day maturity band to isolate smile-shape variation from term-structure effects, and to log-moneyness $|x| \leq 0.02$ (ATM) versus $|x| > 0.02$ (OTM puts and calls). At each bar, Level is the cross-sectional median of mark IV across ATM contracts, Skew is median put-wing minus call-wing IV, and Curvature is the average wing IV minus Level.

Each descriptor is forecast at horizons of 5, 15, 30 and 60 minutes using a Heterogeneous Autoregressive specification [4] on the 5-minute grid, augmented with a lag-1 term, two intraday Fourier harmonics and lagged liquidity features, benchmarked against a naive random walk. Estimation is rolling-origin OLS with an expanding window. Inference uses signed HAC-adjusted Diebold–Mariano tests with a Newey-West bandwidth $\lceil 1.5h \rceil$. We report two R^2-OOS measures: the conventional benchmark against the unconditional mean, and the loss-differential against Naive ($1 - \text{MSE(HAR)}/\text{MSE(Naive)}$), the economically meaningful comparison for highly persistent series.

Findings

The results support the descriptor-specific hypothesis. *Level* is best forecast by a no-change rule: HAR loses to Naive at every horizon, with R^2-OOS (vs. Naive) ranging from -0.876 at 5 minutes to -0.090 at 60 minutes (DM significant at 1%). The conventional R^2-OOS of ~ 0.99 for both models reflects near-unit-root persistence, not skill. *Skew* is forecastable at 60 minutes, with a HAR gain over Naive of +5.3 pp ($p < 0.01$). *Curvature* is the most forecastable component: HAR gains over Naive are +8.9, +13.9 and +18.0 pp at 15, 30 and 60 minutes (all $p < 0.001$), rising monotonically with horizon (the opposite of Level) consistent with slow dissipation of tail-protection demand through the order book. The ranking is unchanged when the maturity band is widened to 7-60 days or when the bid-ask midpoint replaces mark IV.

Contribution and Implications

To our knowledge, this is the first systematic intraday smile-shape forecasting study for Bitcoin options on Deribit. The contribution is a clean descriptor-specific predictability ranking: ATM Level is informationally efficient at intraday horizons, while smile-shape components carry forecastable information that increases with horizon. The Curvature finding has direct implications for short-term hedging of straddles, strangles and convexity-bearing positions. Limitations include the short three-month sample, the single-venue and BTC-only scope, and the absence of a hedging-PnL evaluation. Economic-value evaluation, machine-learning extensions and longer multi-regime samples are left to future work.

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GREENHUSHING PRACTICES IN FAMILY FIRMS

Battisti, Enrico[1] Bongiovanni, Noemi[1] Salvi, Antonio[1]

[1] Department of Management "Valter Cantino", University of Turin, Turin, Italy

Keywords: Greenhushing, Family firms, Socioemotional wealth, environmental performance, environmental disclosure

Introduction and theoretical background

In the 21st century, the pressure on companies to adopt sustainable practices has grown exponentially, forcing them to justify their environmental and social actions (Block et al., 2024). In this context, greenwashing has emerged as a common strategy for gaining undeserved environmental legitimacy, pushing regulators to intensify disclosure requirements and tighten environmental reporting standards (Lee & Raschke, 2023; Forliano et al.,2025). The increasingly demanding regulatory environment has led firms toward a defensive strategy known as greenhushing, whereby companies deliberately underreport their environmental performance and outcomes to avoid litigation arising from discrepancies with green regulations (Font et al., 2017; Wang et al., 2026). Despite its growing relevance, the literature on greenhushing remains fragmented and underexplored, particularly in the context of family firms, where communication dynamics and environmental performance measurement are particularly complex (Battisti et al., 2023). Their unique governance structure, shaped by the preservation of socio-emotional wealth (SEW), suggests a greater propensity to adopt strategic silence (Huang et al., 2025).

Aim

This study investigates whether family firms (FFs) exhibit a greater propensity for greenhushing than non-family firms. Drawing on SEW theory, we argue that the particular governance structure of FFs, characterized by long-term reputational orientation and strong commitment to the community, incentivizes under-communication of environmental achievements. This research aims to expand the empirical evidence on greenhushing, highlighting its growing relevance and rapid evolution as a strategic response to an increasingly

demanding regulatory environment. Furthermore, it represents an early attempt to examine how ownership structure may influence this emerging phenomenon, providing a basis for extending the greenhushing literature toward ownership-related factors.

Methodology

The analysis is conducted on a panel dataset of European listed companies covering the period 2012-2023. The final sample includes 383 firms, whose financial and ESG data were sourced from LESG Workspace and subsequently integrated with ownership data from Bureau van Dijk Orbis. Family firms are identified through a binary variable based on the definition of Global Ultimate Owner. The greenhushing is measured as the residual of an Ordinary Least Squares regression of environmental disclosure (dependent variable) on environmental performance (independent variable), controlling for firm size, leverage, and profitability, including year and industry fixed effects. To address sample heterogeneity, results are validated through Propensity Score Matching (PSM) with caliper and matching with replacement.

Preliminary results

Preliminary results show a consistent and clear direction. Descriptive analysis reveals that, despite comparable levels of environmental performance, FFs exhibit significantly lower environmental disclosure than non-family firms ($p = 0.048$). Regression analysis confirms a negative association between FF status and greenhushing scores ($\beta = -0{,}024$), suggesting that FFs tend to underreport their environmental performance. Although the results do not reach the conventional level of significance, likely due to the limited number of family firms in the sample, the direction of the effect remains stable and consistent. The PSM analysis supports this pattern, highlighting a stronger effect magnitude ($\beta = -0.029$) on a balanced sample, and reinforcing the robustness of the observed tendency.

Conclusion

This study contributes to an under-explored area of literature, offering preliminary empirical evidence on greenhushing as a governance driver phenomenon. Although the regression results do not reach conventional significance levels, the consistently negative trend observed cross descriptive and robustness analyses suggests that FFs tend to underreport their environmental performance, supporting the theoretical expectation that they may prioritize reputational protection over transparency. This behavior could translate into practical consequences,

including a higher cost of capital for FF due to the reduced environmental transparency toward investors. Future research should extend the analysis to mid-cap European firms, where family ownership is more prevalent, and incorporate continuous ownership variables to capture the intensity of family control and its effect on environmental communication strategies.

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MODERNISING CORPORATE PLANNING: APPLICATION, CHALLENGES, AND IMPACT IN PRACTICE

Kraus, Patrick[1]; Henttu-Aho, Tiina[2]; Krämer, Etienne Leon[1]

[1] Business School, Pforzheim University, Pforzheim, Germany
[2] Oulu Business School, University of Oulu, Oulu, Finland

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Abstract

This study investigates the adoption and impact of modern budgeting approaches in corporate planning. Through expert interviews with consultants and controllers, the research finds that while many organisations still rely on traditional Excel-based planning, there is increasing awareness of and interest in integrated software solutions, simulations, and predictive analytics. These techniques may deliver greater transparency, enhanced planning accuracy, and improved responsiveness. Nonetheless, significant barriers persist, including costs, complexity, and cultural resistance. The results indicate that benefits such as efficiency gains and organisational flexibility are existing but often gradual and difficult to measure, contributing to scepticism and slow adoption. Effective change management, comprehensive training, and clear communication are crucial for successful implementation. Despite the challenges, the research reveals substantial potential for modern approaches to improve corporate planning, advocating for ongoing development and further research to support informed decision-making in dynamic business environments.

Introduction

It can be observed that the transformation of the global economic system has accelerated dramatically in the last months and the world order in which business activities have been organised for decades does hardly exist any more (Dunoff and Pollack, 2025; Shahini and Shahini, 2025). As a result economic uncertainties for businesses have increased tremendously (Johnsen, 2023) and Europe is trying to find new trade partners in South and Latin America and Asia to stabilise a rule-based approach of doing business. With an export focused economic system, Germany is especially suffering under these developments and traditional busi-

ness models are not successful any more (Grömling, 2025). There is the urgent need to modernise and transform the German and European economic system to ensure future growth and prosperity. Budgeting and corporate planning are important corporate activities within the finance function and form the base of decision-making processes (Eichholz *et al.*, 2024; Klovienė and Uosytė, 2019). Especially, in times of constant change and crisis, which we can currently observe in the context of the German economy, firms need to carefully allocate their resources (Becker *et al.*, 2016; Eichholz *et al.*, 2024). Additionally, digital transformation puts pressure on traditional budgeting and planning approaches (Bergmann *et al.*, 2020; Fähndrich, 2023). Despite the challenges and downsides associated with traditional budgeting and planning approaches (Benzenhöfer *et al.*, 2025; Bergmann *et al.*, 2020; Klovienė and Uosytė, 2019), there is evidence that traditional approaches are still widely used in corporate practice (Benzenhöfer *et al.*, 2025; Henttu-Aho and Järvinen, 2013).

The aim of this paper is to better understand the current application and development of modern methods and tools in budgeting and corporate planning. It explores the factors that prevent organisations from adopting new concepts to optimise their planning processes. The study provides important contributions by offering a current practitioner perspective on the application of modern concepts based on subject matter expert perspectives in the sense of experienced consultants. With their expertise developed in various consulting projects, they can provide a comprehensive view on the phenomena under research.

The subsequent section provides a brief overview of the literature on budgeting and corporate planning. We then discuss the method used in this research, which tends to be a qualitative, exploratory approach. The following results and a discussion section provides a better understanding of modern budgeting techniques. The paper ends with a conclusion.

Literature Overview

The literature highlights that there are a number of advantages of budgeting and corporate planning. For instance, Rice et al. (2024) examined the relationship between strategic planning, budgetary planning, and future sales in their study on a sample of Australian SMEs. They found that formal budgetary and strategic planning is an important part of a well-run business, highlighting that then decisions are better aligned to the desired outcomes. Vividly

they argue that '[a]ppropriate planning and control systems are a counterpoint to organisational disarray and managerial capriciousness' (Rice *et al.*, 2024). However, it has to be noted that the dataset, they used is from 1995 to 1998 and may not account for recent developments. It seems that during a crisis, firms see a higher importance of the budgeting and planning function (Becker *et al.*, 2016; Eichholz *et al.*, 2024), although in situations of crisis, conflicts and disputes about the allocation of scarce resources tends to increase in contexts of organisational routines such as budgeting (Broman and Rocha-Pinto, 2023). Eichholz et al. (2024) show that budgeting has a positive influence on organisational resilience (Roffia and Dabić, 2024) but no significant association to competitive advantage, which they, however, partly explain with the research design during the COVID-19 pandemic.

Others highlight the downsides of traditional budgeting such as the time-consuming generation of budgets, associated costs, and the static, inflexible nature of budgets (Bergmann *et al.*, 2020; Hansen *et al.*, 2003; Neely *et al.*, 2003) as well as that annual budgets are outdated soon, causes well-known budget games, and lacks a real value adding function for operational business units (Henttu-Aho and Järvinen, 2013). Klovienė and Uosytė (2019) explain that traditional budgeting typically uses historical data as a reference for future planning. Such systems naturally reach limits in times of transformation and fundamental changes that can hardly be foreseen, which currently rather tends to be norm than the exception. At least with the efforts related to budgeting, Bergmann et al. (2020) found that the integration of business analytics in the budgeting process may lead to an increased satisfaction with the budgeting process. Others report on the usefulness of rolling forecast approaches to reach a more forward-looking management approach (Henttu-Aho, 2016). Bukh *et al.* (2025) vividly exemplify the journey of a company from abandoning budgets to reintroducing them again, complementing them with forecast-based approaches, as they say '… statistically projecting, rather than negotiating, the corporate budget was considered an improvement to its role fulfilling budgeting purposes' (Bukh *et al.*, 2025).

Corporate planning and budgeting has been discussed in scholarly research for several decades (Hansen *et al.*, 2003; Neely *et al.*, 2003; Stonehouse and Pemberton, 2002). However, we still see the need for further studies in this area. Traditional budgeting methods are still widely used in corporate practice despite existing challenges (Benzenhöfer *et al.*, 2025). However, some scholars observed incremental steps towards beyond budgeting logics but not replacing budgeting in its totality (Henttu-Aho and Järvinen, 2013). While studies note positive

effects of implementing modern planning methods, there is a lack of current evidence demonstrating how effectively these approaches resolve existing budgeting challenges. Although technologies generally improve budgeting compared to previous practices, critical issues such as uncertainty, budgeting efficiency, and forecasting accuracy remain insufficiently explored. Furthermore, studies indicate that companies are increasingly interested in modern planning processes and tools. However, development and improvements in practice were often still in early stages, with significant hurdles remaining. This context informs two central research questions for the present study:

- RQ1: How do companies organise and use modern planning approaches and tools in practice?
- RQ2: What factors influence and hinder the development and implementation of modern planning procedures?

Research Design and Method

Data was collected via qualitative expert interviews (Kvale and Brinkmann, 2009). This approach focuses on understanding and interpreting subjective perspectives. Qualitative research aims to generate theoretical insights by exploring the experiences and knowledge of individuals with exclusive expertise in the subject matter (Froschauer and Lueger, 2009).

Expert interviews in this study were semi-structured, guided by a flexible and open interview guide. This allowed us to adapt questions to each situation and develop an in-depth understanding through probing questions. Such flexibility ensured that interviews could be tailored to the background and expertise of each participant, maximising the information gathered (King and Horrocks, 2010). The process and analysis were documented to maintain transparency and allow scrutiny, with the researcher incorporating existing theoretical knowledge and remaining open to new insights.

A qualitative approach was chosen for its suitability in exploring how modern planning methods address corporate planning challenges. Interviews provided in-depth insights and captured a range of perspectives, including scepticism towards modernisation.

Given the nature of qualitative research, a smaller but meaningful sample is appropriate. Potential experts were identified based on their publicly available profiles. Nine interviews were conducted with experts contacted via email, and meetings held online using Microsoft Teams. The primary focus was on consultants from the Big Four consulting firms, who typically advise large companies and possess broad experience in optimising corporate budgeting and

planning processes. Their expertise enabled the collection of extensive information about current practices and innovations. Additionally, consultants from other firms specialising in medium-sized clients were included, alongside two experts from operational controlling. The latter interviews enabled a comparison between consultant perspectives and the practical realities within company controlling departments, highlighting any differences between ideal models and actual practices. For anonymity, interviewees and their companies were labelled with numbers (expert 1–9).

Expert	Industry	Function	Interview duration
1	Big Four Consulting	Consultant	59min
2	Consulting	Consultant	31min
3	Energy supply	Group controller	34min
4	Big Four Consulting	Consultant	37min
5	Big Four Consulting	Consultant	25min
6	Big Four Consulting	Consultant	38min
7	Automotive supplier	Head of Controlling	30min
8	Consulting	Consultant	40min
9	Big Four Consulting	Consultant	40min

Table 1:Interview Sample (created by the authors)

The interviews were analysed using template analysis with thematic coding (Braun and Clarke, 2006; King, 2004). This method involves creating a list of hierarchical codes that capture key themes from the text. Codes are assigned to sections of text for structured interpretation. Template analysis is well-suited for qualitative research and enables systematic organisation of interview content. Interviews were transcribed with Trint and analysed in MAXQDA. The coding scheme is shown in Table 2.

Themes	Codes
Application of modern planning approaches and tools	Distribution, tools, planning systems, analytics, top-down, integrated planning, event-driven planning, rolling planning, value drivers, simulation, beyond budgeting
Impact of modern procedures	Transparency, quality improvement, added value, simplification, accuracy, cost reduction, basis for comparison, basis for decision-mak-

	ing, responsiveness, sustainability, Crisis security, uncertainty
New planning challenges	Expertise, complexity, coordination, conflict potential, change management, clarification, controlling as a challenger
Implementation barriers	Costs, scepticism, effort, speed, priorities, shortage of skilled workers, solutions, promotion of young talent

Table 2: Themes and Codes identified in Template Analysis (created by the authors)

Results and Discussion

Modern planning approaches and their application in practice

Application of modern approaches

Expert 1 observes that many companies possess essential knowledge and have already adopted some 'modern' planning techniques, typically using Excel. Although these firms are not starting anew, their processes often lack efficiency and speed, as Excel's functions are limited. This highlights the importance of dedicated *planning software platforms*. Expert 8 agrees, noting that trends in available tools are recognised. However, this may create tension between the CFO's targets and the realities within individual departments. Identifying and addressing these conflicts is crucial to achieving better planning outcomes. Expert 4 adds that organisations increasingly acknowledge the need for varied approaches to successful planning. A significant challenge in digitalising planning processes is the neglect of conflicting targets and the iterative nature of planning itself. Processes must be revised before digital tools are implemented.

Expert 2 points out that SMEs still have considerable potential to adopt modern planning methods. Although effective tools exist, using them requires time, expertise, and resources which SMEs often allocate elsewhere or lack. Many SMEs do not recognise the necessity of business planning, leading to debates about its value and delaying modernisation. Changing organisational mindsets to appreciate how planning and related tools can support management is a critical first step. Expert 3 notes that lengthy planning cycles have initiated discussions about improving efficiency, but often established routines remain unchanged. Attempts to streamline planning, such as the 'three-week plus X' model, have proven more effective in theory than in practice. Nevertheless, ongoing feedback from decentralised planning units suggests that restructuring and increased tool support are important in the near future.

Modern software and analytics

Technological and procedural advancements are vital for modernising budgeting and corporate planning. From a technological standpoint, dedicated planning software and tools are required to efficiently implement planning processes. Many organisations utilise solutions such as PowerBI, which, according to Expert 1, is accessible as a local installation and is relatively user-friendly. As a result, it is commonly employed as a starting point for developing planning dashboards. Expert 2 highlights additional tools, noting that smaller solutions like LucaNet are cost-effective alternatives to larger ERP systems such as SAP, and specialised tools exist for functions like liquidity management. Most tools offer Excel integration, and combining different tools is a standard approach to supporting planning.

Expert 9 emphasises the necessity of a *clearly defined planning process* before choosing an appropriate tool. In the absence of such clarity, many organisations continue relying on Excel. Expert 4 argues that tools should serve as enablers; digital transformations driven solely by tool selection often fail due to insufficient focus on the transformation's objectives. The desired outcomes should guide the process, which often involves complex software selection and considerable effort to establish and integrate new procedures.

Expert 6 advocates for a flexible planning platform that can be expanded and supports decentralised planning. Expert 5 stresses the importance of system support, particularly for bottom-up processes, noting that *automated aggregation and workflow features* reduce manual effort. In expert 3's team, no dedicated planning platform is used; while SAP Analytics Cloud is available, it is not yet applied to planning.

Business analytics and predictive analytics are increasingly relevant technologies, which is confirmed by the literature (Bergmann *et al.*, 2020). Expert 5 describes predictive planning as a means to enhance planning quality and efficiency, particularly for organisations with stable business models. However, here analytics currently plays a minor role in planning, mainly due to the assumed high data granularity required in controlling. Expert 1 adds that meaningful use of analytics depends on the availability of a robust, high-quality database, something many companies lack. Expert 9 notes that predictive analytics also requires historical data and suitable source systems. However, according to expert 4, predictive analytics increasingly positions controllers as consultants within the organisation and the literature found that business analytics may increase the satisfaction with budgeting processes (Bergmann *et al.*, 2020). However, expert 8 estimates that it will take several years before analytics becomes more prominent, primarily due to *inadequate data quality* and acceptance issues. Analytics-generated figures that differ from manually planned values must be justified to management, and

trust in these figures depends on data quality. The need to improve data quality is therefore significant. Expert 2 reports that analytics is largely absent in SMEs, mainly due to their general attitude towards corporate planning. For SMEs to consider analytics, planning practices must first be modernised. If an SME with an annual turnover of 160 million euros relies solely on Excel, foundational improvements in planning are necessary before analytics can be considered. Operational controlling reveals limited use of analytics in group planning, as stated by expert 3. However, analytics is utilised for other analyses. Expert 7 indicates that business and predictive analytics have been explored, with potential applications identified, and the company is increasingly engaging with artificial intelligence. Overall, experts recognise substantial potential in in planning software and especially business analytics, but its current adoption is limited, mainly due to insufficient data volume and quality.

Modern processes and concepts

Beyond the adoption of technology and software, it is essential to modernise fundamental planning processes. The experts identified several key topics and process innovations. Expert 5 advocates shifting from a traditional decentralised, bottom-up approach to a *top-down method*, noting that top-down planning streamlines the process and may achieve comparable results with less effort. For expert 6, the widely applied top-down-bottom-up method represents modern planning, though the importance of clear guidelines is highlighted for operational units to shorten planning intervals. This method is also applied in expert 7's company, where centralised sales planning is distributed to individual production sites, which then plan quantities bottom-up, following set guidelines. Deviations from management expectations then trigger renewed top-down target setting.

Expert 2 emphasises that effective corporate planning should not be the sole responsibility of controlling; decision-makers should early involve other relevant departments, such as sales, in the planning process. Software support is seen vital for this integration. Expert 8 agrees, stressing that planning today must not occur in isolation, for instance, increases in volume require coordination between HR and production departments to ensure capacity. ERP systems enable integration across departments. Expert 4 highlights the importance of linking planning to strategy, execution, and planning.

Expert 4 also describes *event-driven planning*, where new plans are created only as necessary in response to specific events, reducing planning effort. Annual, rolling planning approaches are resource-intensive and less valuable in volatile environments, while rolling approaches,

covering shorter periods of time, allow for a more efficient forward-looking resource allocation. Fixed planning cycles can be restrictive.

Value driver-based planning also holds significant potential, as noted by experts 5, 6, and 9. This approach is widely used in their consulting projects and enables automation via driver models. Expert 6 identifies determining the relevant level of detail for value drivers as a common challenge. In expert 3's organisation, value drivers are used to simulate results, which are then compared to those from decentralised units to assess robustness. *Simulation models* are increasingly important for modern planning approaches. Simulations provide increased-certainty and flexibility, allowing various scenarios to be recalculated efficiently. They help ensure plans remain relevant over time. Expert 9 highlights factors such as exchange rates and commodity prices as key variables for simulation, with driver models essential for meaningful scenarios. While some companies have implemented simulation models, many lack the prerequisites.

Expert 4 mentions the *Beyond Budgeting* framework, which offers guidance for management and finance functions. Although useful for consulting, expert 3 found it unsuitable for group planning due to structural differences across divisions. The literature partly seems to confirm this, as some companies reintroduce budgets after having abandoned them, while maintaining a higher degree of flexibility of budgets (Bukh *et al.*, 2025).

In summary, the experts outlined several approaches and technologies shaping modern corporate planning. While several organisations are aware of these methods and have begun to implement them, considerable potential remains unused. Traditional processes still dominate, though ongoing modernisation seems to be evident (Henttu-Aho, 2016).

Impacts of modern planning procedures

Improvements to corporate planning

Expert 4 highlights that the pursuit of planning accuracy is unrealistic in increasingly volatile environments, requiring a shift to relative targets rather than fixed budgets (Neely *et al.*, 2003). Experts 1, 2, and 8 highlight increased transparency as key benefits. Planning software creates a single source of truth, eliminating the need for manual consolidation and increasing efficiency. While planning quality is generally considered to improve, this is difficult to measure. Improved data quality leads to better planning content, although external factors such as price fluctuations and energy costs still present challenges. Modern methods also add value by reducing repetitive tasks, allowing controlling more time for analytical and value-adding activities. The limited time during planning can be used for meaningful discussions

with the operational units involved in planning. Expert 4 emphasises that finance departments should focus on generating value with existing resources, rather than simply cutting costs. Expert 9 observes that integrated planning accelerates processes, enabling more time for value-creating efforts, and breaking down departmental silos.

Experts 1, 6, and 8 also mention simplification as a result of modern planning approaches. Tools and approaches make it easier to create plans, while integration and data transparency streamline coordination between departments. This also leads to shortened planning cycles. Planning accuracy is another important effect, though difficult to measure directly. Expert 6 sees this as significant, particularly in inventory and procurement management, where accuracy can have monetary impacts. Expert 8 adds that forecasting accuracy depends on the quality of underlying data; combining forecasting and simulation may enhance accuracy. The value of forecasting is also highlighted by the literature (Bukh *et al.*, 2025; Henttu-Aho, 2016).

Modernised planning may also contribute to cost reduction. Expert 9 reflects on a case where improved supply chain planning saved a car manufacturer millions by reducing reliance on expensive air freight. Optimised working capital planning and modern sales planning can also reduce costs, although cost reductions due to improved financial planning is difficult to measure. Modern approaches may improve the basis for comparisons and improve decision-making. Experts 1 and 2 stress that this enables managers to understand and address the reasons behind failed targets. Transparent data origins and inputs facilitate better discussions and hence support. Moreover, modern planning approaches may also improve organisational responsiveness, as rapid scenario calculations and sensitivity analyses, allowing quick reactions to changing circumstances. However, some challenges remain, as experts 1 and 2 refer to cultural barriers, such as resistance to transparency and ongoing communication issues between departments. Integrated planning supports collaboration but cannot eliminate siloed behaviour.

Regarding crises, expert 5 explains that modern planning methods, particularly the use of simulation, offer flexibility and can support effective crisis management. Simulations enable organisations to model uncertain scenarios and develop implementable measures. Expert 3 concurs, noting that crises are inherently unpredictable and often catch organisations unprepared. Regardless of the process or technology in place, crises invariably result in increased workload and increased uncertainty. The challenge of solving a crisis remains, whether modern planning procedures are used or not.

Emerging challenges

The adoption of modern planning methods also introduces new challenges. One key issue is the expertise required. Expert 1 notes that the successful application of planning software depends on employees capable of operating them, often requiring initial and on-going support from consultants. The goal is to build internal expertise, but hiring staff already familiar with tools is difficult, meaning specialists must be trained. Expert 5 also stresses the need for strong IT skills among relevant employees for successful IT projects. Expert 1 observes that integrated planning models are more complex and time-consuming to set up. Modern methods account for multiple dimensions, requiring careful education and management to avoid overwhelming users. Pilot projects and a 'think big, start small' approach, as expert 9 recommends, are helpful, as is careful planning of the implementation of technologies and planning techniques. Expert 5 considers the design of the software as critical for project success. Expert 6 confirms this and refers to the need for seamless internal integration to avoid system breaks requiring manual data treatment or corrections. Experts 1 and 9 agree that these projects require thorough preparation. Moreover, experts 2 and 8 point out that established reference values can lead to scepticism when new procedures deliver different outcomes. Discussions shift from how to achieve targets to why system-generated values cannot be met. New approaches may reveal hidden problems, such as inefficiencies, which can lead to internal conflicts. Effective change management is essential in such projects. Decision-makers may feel uncertain about a fundamental change of planning methods. Expert 4 highlights the importance of coaching to reduce these uncertainties, while expert 6 adds that transparency and a collaborative style are key. The parallel use of old planning logics and tools (e.g. Excel) often impedes progress. Expert 8 notes that cultural change and clear communication are crucial, as poor communication can cause project failure.

Implementation barriers of modernised approaches

It has to be noted that a major barrier to modernising planning processes could be associated costs. Significant consultancy fees and software expenses are frequently required, but the benefits of modernised planning approaches are difficult to measure quantitively leading companies to resist starting these kind of projects (experts 1, 2, and 4). Experts 2, 4, 5, and 9 report that organisations often fear that process changes will produce unfavourable outcomes. There is reluctance to change established routines, coupled with doubts that new methods deliver meaningful advantages. As a result, companies may lack openness to replacing current processes. Expert 3 notes that if existing methods work, there is little motivation to change,

even without planning software. Expert 6 reminds us that during such projects processes may be disrupted before improvements materialise, making benefits difficult to perceive and discouraging further adoption. Expert 4 highlights that workforce constraints limit capacity for transformation projects, as many employees are at their workload limits, and expert 6 points out that companies may favour other priorities, such as SAP S/4HANA migration. Expert 2 agrees that limited knowledge and skills impede the implementation of modernised planning approaches.

Experts offer solutions to overcome some of the identified barriers. Expert 1 recommends early involvement of senior management and recognising requirements throughout the projects to reduce uncertainty and highlight the benefits. Extensive user training is of eminent importance. Expert 8 stresses that familiarising users with the software and techniques early on is similarly important. Expert 2 suggests demonstrating applications on demo systems to build trust and secure approval, allowing benefits to be shown with minimal initial cost. For Expert 6, communicating the advantages of modern planning approaches is crucial for acceptance and successful implementation.

Conclusion

Synthesis of findings

This research examined how companies currently apply modern planning approaches, their concrete impacts on planning outcomes, and the factors that hinder implementation of new processes or tools. While traditional planning remains widely applied in practice it can be noted that the interest in modern planning is increasing, particularly regarding new systems and methods such as value driver-based planning and simulation models.

The findings show considerable potential for modern approaches. Some methods, including business analytics, simulations and integrated planning systems, are already used in practice and offer potential for further transformation. Companies using modern techniques benefit from increased planning accuracy, improved transparency, and the ability to respond more effectively to uncertainty and crisis. Scenario analysis, simulation, and value driver-based planning help organisations better anticipate change and adapt more quickly. These approaches contribute to more resilient planning, but also introduce new challenges, such as increased complexity, the need for specialist expertise, and demanding coordination of transformation projects. Effective change management is required to ensure acceptance and successful integration of new concepts.

Several barriers hamper the adoption of modern planning. There might be high costs and companies lack the budget or are unconvinced of the benefits, especially as improvements can take time to materialise. Decision-makers often hesitate to disrupt established processes, and a shortage of skilled staff further complicates transformation efforts. Time and resource demands are substantial, and priorities such as other IT projects (e.g., SAP S/4HANA migrations) often take precedence.

Limitations and avenues for further research

While expert interviews provided valuable insights into organisational practices, the findings are limited by a smaller sample size, which is line to the objectives of the study. The sample further includes several consultants, that have a cross-company perspective but may have limited insights to internal organisation individual context factors. Measuring concrete improvements and long-term impact of modern planning remains challenging, as many benefits cannot easily be quantified. This study provided an overview of key approaches, but further research is needed to validate, deepen, and operationalise these results.

Future studies should capture the evolving views of decision-makers as more techniques and solutions become available and should seek to conceptualise in greater detail improvements through case-based studies. Continued investigation will help organisations understand the benefits and best practices for implementing modern planning, supporting stronger, more flexible corporate management and controlling in dynamic economic environments.

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UNDERSTANDING FINANCIAL PRODUCT CHOICES: THE ROLE OF LITERACY, PERSONALITY, AND BANKING RELATIONSHIPS

Teixeira, Bruno[1] Moutinho, Nuno[1] Meneses, Raquel[1,2]

[1]School of Economics and Management, University of Porto, Porto, Portugal

[2]INESC TEC - LIAAD - Institute for Systems and Computer Engineering, Technology and Science, University of Porto, Porto, Portugal

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Abstract

This study examines the role of financial literacy, personality traits, and relational factors in shaping financial product selection. Drawing on the Big Five framework, it proposes a multidimensional model that also considers the mediating role of personal budget management. Using survey data from 215 participants and Structural Equation Modelling (PLS-SEM), the results show that financial literacy positively influences the adoption of more complex financial products. Conscientiousness and Openness to Experience are associated with disciplined financial behaviour and long-term planning, while personal budget management acts as a key mediating mechanism.

Relational factors present mixed effects: trust in bank sales representatives significantly influences financial decisions, sometimes discouraging the adoption of complex products, whereas institutional reliability is not significant.

These findings contribute to the literature by integrating cognitive, psychological, and relational dimensions, offering practical implications for financial institutions in terms of customer segmentation, advisory practices, and financial literacy initiatives.

Introduction

In the current context, we are witnessing an increase in the complexity and sophistication of financial products available to different consumer profiles. This evolution has heightened the need for research that deepens our understanding of the factors influencing financial decision-making, especially in markets such as Portugal, where financial literacy remains a significant challenge (OECD, 2023; Demertzis et al., 2024). This study aims to advance literature by integrating psychological factors such as personality traits and relational dimension (including trust in banking institutions and relationships with sales representatives) into the analysis of financial product choice. By combining the Big Five personality model with established frameworks of financial literacy and trust, the research offers a comprehensive perspective on how individual characteristics and perceived relationships with banks shape consumer decisions.

The main contribution of this work lies in its multidimensional approach rather than examining financial literacy or personality in isolation, it explores their interplay and the mediating role of personal budget management. This enables a more nuanced understanding of consumer behaviour, with practical implications for financial institutions seeking to personalize their offerings and improve customer engagement.

The study employs a quantitative methodology, using a structured questionnaire administered to a diverse sample of 215 participants. The results reveal that financial literacy and certain personality traits (notably Conscientiousness and Openness to Experience) are associated with prudent financial behaviour and long-term planning. Trust in bank sales representative also emerges as a critical factor, with a negative association observed between perceived reliability and the subscription to structured products.

By clarifying the psychological and relational determinants of financial product selection, this research contributes new insights to both academic theory and banking practice, highlighting the importance of behavioural profiling and targeted strategies in the Portuguese context.

Literature Review

Financial products selection

The banking sector is characterised by a broad range of products and services designed to address the financial needs of different customer segments, including both individuals and businesses. Generally, this offering includes deposit and savings instruments, credit, payment methods, investment services, and financial protection products such as insurance [1] and retirement plans. In recent years, banking institutions have responded to the context of digitalisation, increased competition, and more demanding regulations by promoting innovation and personalisation of their services. Simultaneously, there is a growing integration between traditional services and digital solutions, aiming to maximise customer convenience, agility, and trust. In this way, the banking sector reflects a process of continuous evolution, oriented not only towards the profitability of institutions but also towards objectives of sustainability, financial inclusion, and improving the consumer experience. Several factors (financial literacy, personality, relational factors) play a significant role in understanding the financial behaviour of individuals, particularly in the selection of financial products.

Financial literacy

From a minimalist perspective, financial literacy can be understood as an individual's ability to manage their money (OECD, 2023; Remund, 2010; Shi et al., 2025), which includes five competencies: knowledge of concepts; ability to communicate about financial concepts; ability

[1] "Savings insurance" is used here as a generic term for insurance products with a savings component, including life insurance, retirement savings plans, and other hybrid solutions.

to manage personal finances; ability to make the most appropriate decisions for their financial well-being; and to effectively plan for their future financial needs. Financial literacy is, therefore, a combination of awareness, knowledge, skills, attitude, and behaviour necessary to make sound financial decisions and achieve financial well-being (OECD, 2011). Studies such as those by Lusardi and Mitchell (2014) and Huston (2010) highlight the importance of financial literacy in promoting healthy financial behaviours, even placing it as one of the fundamental pillars for making conscious and effective economic decisions, since those with greater financial knowledge tend to better understand the products available on the market, assess risks, and plan their future with greater security and consistency.

***Psychological* factors**

The Big Five personality traits model (Agreeableness, Conscientiousness, Openness to Experience, Extraversion, and Neuroticism) has been widely used to explain differences in economic and financial behaviour. These traits represent relatively stable patterns of thought, emotion, and behaviour, influencing how each person perceives risk, manages their resources, and interacts with financial institutions to ultimately make financial or investment decisions.

The dimension of Agreeableness, one of the central traits of the Big Five Personality Model, is associated with characteristics such as empathy, cooperation, trust, and concern for others. People who demonstrate this characteristic value harmonious relationships and avoid conflict. This personality trait can be reflected in their financial attitudes and behaviours (Dalkilic & Kirkbesoglu, 2015). Considering the context of subscribing to financial products such as current accounts, investment funds, future-oriented savings, perception of financial security, and disciplined resource management, it is presumed that agreeableness plays a relevant role in the decision-making process at the time of subscription. Agreeableness has been associated with greater risk aversion and a preference for conservative financial strategies (Gurun & Booth, 2024), such as regular savings and the choice of financial products considered safe, motivated by a desire for stability and family well-being.

Conscientiousness is characterised by attributes such as organisation, responsibility, persistence, and goal orientation. Individuals with this personality trait tend to plan ahead, be disciplined in their actions, and demonstrate a strong sense of duty. In the realm of personal finance, this characteristic can translate into a greater propensity to subscribe to financial products that promote stability and long-term planning, such as term deposits, investment funds, savings for the future, perception of financial security, and the adoption of disciplined management practices. The literature has shown that conscientiousness is indeed associated with prudent financial behaviours, such as regular saving, budget control, and a preference for low-risk investments (Moore & Healy, 2008).

Openness to Experience is a personality trait that reflects intellectual curiosity, creativity, imagination, and a predisposition to explore new ideas and experiences. Individuals with high levels of this trait tend to be more receptive to innovation, change, and complexity, which can significantly influence how they make choices.

Extroversion is a personality trait characterised by sociability, assertiveness, enthusiasm, and a tendency to seek external stimuli. Extroverted individuals tend to be more communicative, confident, and action-oriented, which can significantly influence their financial decisions (Brown & Taylor, 2014). In the context of personal financial management, extroversion is believed to be associated with a greater predisposition to subscribe to financial products such as term deposits, investment funds, financial insurance, and discretionary management solutions. Furthermore, this trait may influence how individuals approach saving for the future, budgeting, and the adoption of structured products, including those involving emerging technologies such as artificial intelligence. The literature suggests that extroverted individuals tend to take more risks and seek opportunities for financial growth, although they may also demonstrate less self-control in certain situations (Brown & Taylor, 2014; Oehler & Wedlich, 2018).

Relational **factors**

Reliability of banking institutions

The perceived reliability of banking institutions is a determining factor in how individuals interact with financial products and services (Gurun & Booth, 2024). When customers trust their bank, they are more likely to subscribe to diversified financial products, follow investment recommendations, and maintain a long-term relationship with the institution. In this context, it is assumed that the perceived reliability of the bank positively influences the subscription of term deposits, investment funds, future-oriented savings products, financial insurance, and discretionary management solutions. Furthermore, this trust may be reflected in a greater openness to the use of structured products and in budget management aligned with the advice and tools provided by the financial institution. Trust in financial institutions is associated with higher levels of financial engagement, greater loyalty, and even a greater propensity to adopt prudent financial behaviours (Ennew & Sekhon, 2007; Johnson & Grayson, 2005). Institutional reliability is therefore a key element in building sustained relationships between customers and banks, with a direct impact on individual financial decisions.

Bank sales representative

Literature has highlighted the importance of the relationship between client and bank sales representative as a determining factor in institutional trust and the adoption of financial products (Ennew & Sekhon, 2007). The quality of service provided, combined with the perception of

competence and integrity of the sales representative, contributes to more informed financial decisions and greater loyalty to the institution.

Customers' perception of bank sales representatives plays a fundamental role in building trust and influencing financial decisions. This dimension encompasses their competence, empathy, clarity of communication, and advisory skills. A well-prepared representative with a customer-focused approach can positively influence the decision-making process when choosing various financial products. In this context, it is assumed that a positive perception of the banking sales representative is associated with the subscription of term deposits, investment funds, future-oriented savings products, financial insurance, and discretionary management solutions. It can also extend to other, more innovative areas, such as the adoption of structured products and the use of artificial intelligence-based tools, especially if the sales representative plays an active role in explaining and recommending these products.

Personal budget

The way individuals manage their personal budget acts as a link between personality traits and the choice of banking products. Effective budget management allows each person to better assess their needs, identify investment opportunities, and make more informed decisions. Individuals with greater budgetary discipline tend to opt for financial products that promote stability and security, such as term deposits, savings insurance, and conservative investment funds. On the other hand, people with profiles more open to experimentation or with greater financial literacy may explore more sophisticated products, such as structured solutions or discretionary management.

Thus, budgetary behaviour not only reflects personality traits but also influences the predisposition to subscribe to certain banking products. This mediation proves essential for understanding the financial decision-making process and for developing personalised banking advisory strategies.

Studies such as those by Xiao and O'Neill (2016) and Kim and Hanna (2017) demonstrate that budgeting is positively associated with prudent financial behaviours, including systematic saving and the strategic use of financial products. This evidence motivates the formulation of hypotheses that relate the budgetary dimension to the adherence to financial instruments that promote stability and security.

Hypotheses

Financial decision-making has been widely associated with individuals' level of financial literacy, which enables them to understand financial concepts, assess risks and benefits, and make more informed choices (Huston, 2010; Lusardi & Mitchell, 2014). In this context, individuals with higher financial literacy are expected to be more capable of selecting financial

products that align with their needs and financial goals.
H1: Financial literacy positively influences the selection of financial products.

Beyond cognitive abilities, financial behaviour is also shaped by psychological factors. Personality traits, particularly those captured by the Big Five model, have been shown to influence individuals' attitudes toward risk, financial planning, and decision-making processes. Traits such as conscientiousness and openness to experience are often associated with more structured and forward-looking financial behaviours, while others may lead to more conservative or impulsive choices (Moore & Healy, 2008). Therefore, personality is expected to play a significant role in shaping financial product selection.
H2: Personality traits significantly influence the selection of financial products.

In addition to their direct effect on financial decisions, personality traits are also linked to financial management practices, particularly in terms of budget control and planning. Individuals with certain personality profiles tend to exhibit greater discipline in managing their financial resources, which is reflected in their ability to plan and monitor their spending (Xiao & O'Neill, 2016; Kim & Hanna, 2017).
H3: Personality traits significantly influence personal budget management.

Personal budget management represents a key behavioural dimension of financial decision-making, reflecting individuals' ability to organise and control their financial resources. Effective budget management is associated with more informed and structured financial choices, including the selection of appropriate financial products.
H4: Personal budget management positively influences the selection of financial products.

Relational factors also play a crucial role in financial decision-making, particularly trust in financial institutions. Trust reduces uncertainty and facilitates engagement with financial products, especially in contexts where products are complex or difficult to evaluate. As such, individuals who perceive banking institutions as reliable are more likely to engage with and select financial products offered by those institutions (Ennew & Sekhon, 2007; Johnson & Grayson, 2005).
H5: The perceived reliability of the banking institution positively influences the selection of financial products.

Similarly, trust in bank sales representatives constitutes a key interpersonal dimension of financial relationships. The interaction between clients and sales representatives can shape perceptions of transparency, credibility, and product suitability. When clients perceive these representatives as reliable, they are more likely to engage in financial decisions and subscribe to financial products (Gurun & Booth, 2024).

H6: The perceived reliability of the bank sales representative positively influences the selection of financial products.

Methodology

This study is characterised by a quantitative approach, which aims to understand the factors that influence the subscription of financial products. Data collection was carried out through the application of a structured questionnaire, designed based on scales validated in the scientific literature. The questionnaire was distributed during June 2025, to a random sample of 215 participants, which allowed for sociodemographic and economic diversity. Participants were recruited from various regions across Portugal and were not affiliated with a single banking institution, ensuring national representativeness and diversity of experiences within the financial sector.

The questionnaire structure consists of items from scales validated in previous studies related to financial literacy (Lusardi & Mitchell, 2011, 2023), personality traits (Big Five Traits Model, Palaiou & Furnham, 2014), perception of bank reliability (Morgan & Hunt, 1994), relationship with the sales manager and budgetary behaviour (Xiao & O'Neill, 2016). The first part collected sociodemographic data, such as age, gender, education, occupation, and monthly income, allowing for the characterisation of the sample.

In selecting the financial products included in this study, consideration was given to the diversity of the national banking offerings, the representation of different risk profiles, and their suitability to clients' financial objectives. The inclusion of these products was designed to ensure a comprehensive behavioural analysis, considering both conservative solutions and more sophisticated options. Table 1 presents the products considered and the respective selection logic.

Financial Product	Selection Logic
Demand Deposits (DD)	A product offering immediate liquidity and low risk, suitable for current transactions.
Time Deposits (TD)	A conservative solution with guaranteed profitability, ideal for risk-averse profiles.
Retirement Savings Plans (RSP)	A long-term product, associated with financial planning and future security.
Pension Plans and Savings Insurances (PP&SI)	Hybrid instruments that combine protection and profitability, with tax benefits.
Multi-asset funds (Funds)	A diversified product, suitable for investors with a moderate risk profile and an interest in professional management.

Structured Products (SP)	Complex solutions with conditional risk, aimed at informed investors with higher financial literacy.
Discretionary Portfolio management (DPM)	Personalised investment service, ideal for clients who delegate decisions to specialists.

Table 1: Financial products

Note: Prepared based on the description of financial products available on the market (2025). The minimum investment amounts for each financial product vary according to the institution and product type. For example, retirement savings plans have minimum subscription amounts specified by each provider, which can be checked on the ASF platform. Structured products typically require higher minimum investments, often starting at €25,000–€50,000, while savings insurance products may start at €5,000–€10,000. These thresholds are indicative and may differ depending on the bank or insurance company, reflecting the accessibility and target profile of each product in the Portuguese market.

Before analysis, the data were prepared according to the methodological recommendations of Hair et al. (2016), including validation, cleaning and coding of responses. For statistical analysis, the Structural Equation Modelling (SEM) technique was used, implemented through the SmartPLS software. This approach allows testing complex relationships between observable and latent variables, being particularly suitable for investigations in the social sciences. The model structure was defined based on previously established theories and included measurement and structural submodels (Marôco, 2014).

Results

This investigation involved 215 respondents (62.3% were male and 37.7% were female), whose sociodemographic and economic characteristics reflect significant variations among the participants. The average age of the participants was 53.8 years, with a median of 51.0 years and a standard deviation of 15.8 years, indicating a diverse sample in terms of age. Regarding net monthly income, it showed an average of €1,975.54, a median of €1,700.00 and a standard deviation of €1,367.35, reflecting a high variability in income levels.

The reliability of the constructs was assessed using three main indicators: Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE). These indicators allow us to verify whether the items that make up each construct are consistently and coherently measuring the theoretical concept inherent in the model.

The results obtained (Table 2) demonstrate that all constructs present Cronbach's Alpha values greater than 0.78, indicating good internal consistency. Composite Reliability varies between 0.81 and 0.90, reinforcing the robustness of the measurement instruments. The AVE, in turn, presents values between 0.55 and 0.65, which confirms the convergent validity of the constructs – i.e., the ability of the items to adequately reflect the concept they intend to measure. Discriminant validity is essential in the evaluation of models in quantitative research, especially

in models based on structural equations. It ensures that the theoretical constructs measured are distinct from each other, meaning that each construct represents a unique concept and does not overlap with others.

	Ext	Agr	Consc	Exp	Neuro	Bud	Inst	Sales	Cronbach's α	CR	AVE
Extraversion (Ext)	0.787								0.85	0.88	0.62
Agreeableness (Agr)	0.42	0.768							0.82	0.86	0.59
Conscientiousness (Consc)	0.38	0.50	0.781						0.84	0.87	0.61
Openness to Experience (Exp)	0.45	0.41	0.47	0.755					0.80	0.83	0.57
Neuroticism (Neuro)	0.30	0.33	0.36	0.40	0.742				0.78	0.81	0.55
Personal Budget Management (Bud)	0.35	0.38	0.42	0.39	0.34	0.806			0.88	0.90	0.65
Reliability of banking institutions (Inst)	0.40	0.44	0.48	0.41	0.38	0.46	0.794		0.86	0.89	0.63
Reliability of sales bank representative (Sales)	0.36	0.39	0.43	0.37	0.35	0.40	0.43	0.775	0.83	0.85	0.60

Table 2: Construct reliability, convergent validity, and discriminant validity (Fornell–Larcker criterion)

The Fornell–Larcker criterion establishes that the square root of the AVE of each construct must be greater than the correlations between that construct and the others. This indicates that each construct shares more variance with its own indicators than with other constructs. In the analysed results, it was observed that all constructs meet this criterion, demonstrating adequate discriminant validity. Based on the Fornell–Larcker criterion, no issues of discriminant validity were detected.

Structural model

Table 3 presents the statistically validated hypotheses.

Relationship	β	t-statistic (|O/STDEV|)	p-value
Agr -> Bud	-0.221	2.784	0.005
Sales -> SP	-0.174	1.965	0.049
Cons -> Bud	0.290	4.054	0.000

Exp -> Bud	0.265	2.854	0.004
Exp -> RSP	0.146	2.163	0.031
Ext -> DPM	-0.144	2.224	0.026
Ext -> Bud	0.187	2.466	0.014
LF -> Funds	0.162	2.844	0.004
LF -> DPM	0.106	2.400	0.016
Bud -> PP&SI	0.191	2.444	0.015

Table 3: Statistically validated hypotheses

Note: LF = Financial literacy. Statistically confirmed relationships are reported for $p < 0.05$.

Discussion

Statistical analysis revealed relevant associations that largely confirm patterns observed in banking practice. Conscientiousness stood out as a personality trait strongly related to budgetary behaviour, suggesting that organised and disciplined individuals tend to manage their resources better. Openness to Experience proved relevant in subscribing to savings products for the future, showing that curious and receptive people are more predisposed to invest with a long-term vision. Extraversion presented an interesting duality: while positively associated with budgetary behaviour, it shows a negative relationship with discretionary portfolio management, which may indicate a preference for personal control in financial decisions. Financial literacy demonstrated a direct impact on the adoption of more complex products, such as multi-asset funds and discretionary portfolio management, reinforcing the importance of technical knowledge in decision-making.

The results of this study reveal a negative association between the perception of the sales representative and the subscription to structured products, which raises relevant questions about the clarity of communication, the complexity of the products, and the alignment of the banking institution's interests with those of its clients.

Structured products are, by definition, complex financial instruments, often composed of derivatives and risk strategies that require a high degree of financial literacy or, at least, a strong confidence in one’s own financial abilities. When a client feels that the explanation provided by the bank's sales representative does not meet their expectations, or if it is excessively technical or oriented towards the institution's interests, they may withdraw due to feelings of distrust and, ultimately, not subscribe to the product.

Budgetary behaviour was positively associated with the subscription to financial insurance products, such as retirement savings plans and savings insurance. This result reinforces the idea that regular financial planning and control practices lead to more prudent decisions oriented towards future financial security.

This study highlights the relevance of certain personality traits and individual skills in financial management and the decision to subscribe to financial products. Data obtained through statistical models demonstrate that Conscientiousness influences financial behaviour indirectly through budget management, whereas Openness to Experience shows both direct and indirect effects on financial product adoption. Conscientious individuals tend to exhibit more organised and responsible behaviours, which is reflected in effective budget management and a greater propensity to invest in financial products. In turn, those with high Openness to Experience show greater interest and predisposition to explore financial alternatives, which favours the subscription to products such as savings plans and insurance.

Financial literacy emerges as a determining factor in the choice of more sophisticated products, such as investment funds and discretionary management. This finding reinforces the importance of educational programmes that promote financial knowledge, empowering individuals to make more informed and secure decisions.

Another relevant aspect is the reliability of the banking sales representative, which can negatively influence the subscription of certain products, such as structured products. A less effective sales approach, or one that generates distrust, can compromise the client's decision, demonstrating the need for adequate training for professionals in the financial sector.

Finally, the role of budget management as a mediating variable between personality traits and financial behaviour is highlighted. The way individuals organise and control their financial resources directly influences their predisposition to invest and subscribe to financial products, acting as a link between personal characteristics and economic decisions.

This allows banking institutions, through a deeper understanding of their clients and their characteristics, to tailor their offerings to them, thereby increasing the level of customer satisfaction with the bank and with its representatives.

In summary, these results contribute to a deeper understanding of the psychological, cognitive, and relational factors that shape financial behaviour, offering relevant insights for educational interventions, business strategies, and public policies aimed at enhancing financial literacy and inclusion.

Conclusion

This study aimed to understand the factors influencing the subscription to financial products by banking customers, based on variables such as personality traits, financial literacy, perception of the banking sales representative, and institutional reliability. Hypotheses were formulated and statistically tested in order to validate a robust explanatory model applicable to the Portuguese banking context.

The results show that, among the set of personality traits known as the "Big Five", some are positively associated with the adoption of structured and complex financial products, such as Conscientiousness and Openness to Experience. Extroversion and Agreeableness, on the other hand, show negative relationships with certain financial practices, suggesting the need for differentiated approaches in customer segmentation.

The customer's perception of the bank sales representative tends to negatively influence the adoption of structured products, thus reinforcing the importance of continuous training and effective communication on the part of these professionals. Budget management should be taken into account by the bank sales representative if it is a practice adopted by the customer; in such cases, it can be directed towards the subscription of insurance and other products such as term deposits and structured products.

The statistically supported hypotheses reveal consistent patterns between psychological variables and financial behaviours. However, some hypotheses were not statistically validated. The perceived reliability of the banking institution, for example, did not show statistical significance in any of the relationships, which may indicate that customers value the relationship with the sales representative more than the institutional brand. These unvalidated hypotheses should not be discarded but rather reviewed and explored in greater depth in future studies.

Building on these findings, the study offers several theoretical and practical implications. It contributes to the literature on financial decision-making by integrating cognitive, psychological, and relational dimensions into a unified framework. The results confirm the importance of financial literacy as a key determinant of financial product selection, while also demonstrating that personality traits—particularly those associated with more structured and forward-looking behaviours—play a significant role in shaping both decision-making and personal budget management. Interestingly, while relational factors are relevant, the findings reveal that the perceived reliability of banking institutions does not significantly influence financial product selection, whereas trust in bank sales representatives plays a more nuanced and decisive role, influencing financial decisions in ways that may either encourage or discourage the adoption of certain products, particularly more complex instruments. This suggests that financial decision-making is more strongly influenced by interpersonal trust than by institutional perceptions.

From a practical perspective, these findings provide important insights for financial institutions and policymakers. The role of trust in sales representatives highlights the importance of client–advisor relationships, not only in promoting product adoption but also in shaping clients' caution toward more complex financial instruments. At the same time, the lack of significance of institutional trust indicates that broader brand perceptions may be less influential than

expected in shaping financial decisions at the individual level. Additionally, the role of financial literacy and personal budget management reinforces the importance of promoting not only financial knowledge but also disciplined financial behaviours, particularly in contexts where individuals may face difficulties when engaging with more complex financial products.

Despite the robustness of the results, the study has limitations that deserve attention. The representativeness of the sample is a noteworthy concern, since the diversity of the Portuguese population may not be adequately reflected. It should be noted that the model prioritises direct relationships, without sufficiently exploring moderating effects or other mediating factors that could enhance our understanding of the phenomena. The inclusion of variables such as trust in the financial system, prior experience with banking products, or attitudes towards risk could offer a more complete and realistic view.

To address these gaps, it is recommended to conduct further studies with larger and more diverse samples, as well as to adopt mixed methodologies that combine quantitative analysis with qualitative approaches.

The practical applicability of the results is evident. Financial institutions can use this information to develop more accurate behavioural profiles, adjusting their product offerings to the psychological and behavioural characteristics of their clients. Several strategies can benefit from this knowledge, such as financial literacy campaigns, training for bank sales representatives, and the development of customised digital tools.

Furthermore, this study provides a solid foundation for understanding the factors that influence the financial decisions of bank customers. The alignment of the results with practical situations and their applicability generate strategic opportunities for banks to improve their commercial approaches, making them more effective and customer-centric. Certainly, methodological and analytical advancements, as well as future research, can further deepen this knowledge, promoting smarter, more inclusive, and value-oriented banking practices.

In summary, this research broadens the understanding of financial behaviour by highlighting the relevance of psychological and relational aspects. The findings offer useful information for financial institutions to better adapt their products to customer profiles. Future research has the potential to investigate these connections in greater depth, fostering a more tailored, efficient, and customer-focused financial system.

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ENGAGEMENT IN THE FEED: HOW BRAND-RELATED USER-GENERATED CONTENT SHAPES CONSUMER-BRAND ENGAGEMENT

Uzunboylu, Naziyet[1], Vrontis, Demetris[1], Melanthiou, Yioula[2], Papasolomou, Ioanna[1]

[1] Department of Management, School of Business, University of Nicosia, Cyprus

[2] Department of Communication and Marketing, Cyprus University of Technology, Cyprus

Keywords: Consumer-Brand Engagement, Brand-Related User Generated Content, Br-UGC, Consumers' Online Brand-Related Activities, COBRAs, Instagram, Netnography, Cyprus

Abstract

The rapid growth of social media has transformed consumer–brand interactions from firm-controlled communication to participatory ecosystems, where brand-related user-generated content (BR-UGC) enables consumers to express opinions, construct meaning, and co-create brand value (Hollebeek et al., 2022; Dretsch et al., 2023). Despite increasing scholarly interest in consumer-brand engagement (CBE), existing research remains fragmented in its treatment of engagement behaviours, content forms, and platform-specific affordances (Dinh and Lee, 2024; Zhang and Phillips, 2025), with limited empirical insight into smaller or culturally distinct markets. Addressing these gaps, this study examines how BR-UGC on Instagram stimulates and shapes CBE through consumers' online brand-related activities (COBRAs) in the context of Cyprus.

The study aims to investigate the nature, drivers, and outcomes of CBE as manifested through BR-UGC, with particular emphasis on differences between Instagram posts and stories. Specifically, it seeks to (i) identify dominant visual, textual, and interactional characteristics of BR-UGC, (ii) analyse how these characteristics influence engagement behaviours across COBRAs (i.e., consumption, contribution, and creation), and (iii) develop an integrative framework linking content features, contextual factors, and engagement outcomes. The study is, therefore, guided by questions addressing how BR-UGC functions as a catalyst for engagement and how platform affordances mediate these processes.

Drawing on Br-UGC, CBE, COBRAs literature, the study responds to ongoing debates concerning the operationalisation of engagement behaviours (Schivinski, 2021; Azad

Moghddam et al., 2025; Dinh and Lee, 2024) and the comparative role of ephemeral (temporary content lasting 24 hours) versus permanent content (remain permanently visible and discoverable on the platform) (Zhang et al., 2024). Methodologically, the research adopts a qualitative netnographic design, enabling an in-depth examination of naturally occurring brand-related interactions on Instagram. The dataset consists of 125 BR-UGC units, including 74 Instagram stories and 51 posts, selected through purposive sampling based on predefined criteria such as brand relevance, public accessibility, and engagement potential. Data are systematically coded using NVivo, supported by structured coding matrices capturing engagement metrics, content attributes, and behavioural responses aligned with the COBRAs framework.

The findings demonstrate that BR-UGC plays a significant role in activating different levels of consumer engagement, with notable distinctions between posts and stories. Visual framing, human presence, brand visibility, and call-to-action cues emerge as key drivers of engagement intensity and type. Stories are found to more strongly stimulate creation-level behaviours due to their interactive and ephemeral nature, whereas posts more frequently support consumption and contribution behaviours through their permanence, visibility, and ability to facilitate prolonged interaction. The study contributes empirically by offering context-specific insights into Instagram engagement practices in Cyprus and theoretically by proposing an integrative Br-UGC Engagement Model that bridges content, behaviour, and platform affordances. Unlike previous models that view engagement as an outcome or classify behaviours hierarchically, the proposed model explains how BR-UGC features and platform affordances shape different COBRAs, offering a more dynamic and platform-sensitive understanding of consumer engagement.

The originality of this research lies in its holistic treatment of BR-UGC as both content and behaviour, its comparative analysis of Instagram formats, and its focus on an under-researched geographical context. While the qualitative design limits generalisability, the study provides rich contextual insights and opens avenues for future cross-platform and longitudinal research. Practically, the findings offer actionable implications for brand managers and digital strategists seeking to design engagement-oriented social media strategies, while theoretically refining existing engagement models through platform-sensitive and behaviourally grounded evidence.

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HOW DO SOCIAL ROBOTS FACILITATE VALUE CREATION IN FINANCIAL SERVICES? CUSTOMER VALUE PROPOSITION, ARTIFICIAL INTELLIGENCE AND SOCIAL ROBOTS IN BANKING

Karageyim Meral[1] ; Durmusoglu, Serdar[2]; Coskun, Ali[3]

[1] CARF Research Center-Bogazici University Istanbul/Türkiye

[2] Management Department, Bogazici University, Istanbul/Türkiye

[3] Management Department Bogazici University, Istanbul/Türkiye

Keywords: Value creation, Value proposition, Artificial intelligence, Social robots, Services, Financial services

Introduction

The customer value proposition (CVP) is defined as an important strategic tool that integrates communication, resource integration and superior packages and offerings (Payne, Frow and Eggert, 2017). The CVP is a central concept in business research and management, bridging strategy and customer communication. In addition, the banking industry is experiencing profound transformation driven by artificial intelligence (AI), social robots, and conversational agents.

Purpose

The aim of this study is to understand how artificial intelligence impacts and transforms the bank-customer relationship and the design of CVP for social robots.

RQ1 How do banks design customer value proposition for social robots in financial context?

RQ 2 What are the challenges and problems?

Literature Review

Social robots, virtual service assistants, and humanoid robots are defined as robots that work in a service context designed to communicate and connect with individuals in social environments.

According to Vargo and Lusch value propositions should be understood not merely as promises but as perspectives for facilitating value creation through resource integration among actors (Vargo and Lusch, 2008, 2016; Gummerus, 2013; Vargo, Akaka and Vaughan, 2017; Tadajewski and Jones, 2021). Payne et al. (Payne, Frow and Eggert, 2017; Manser Payne, Peltier and Barger, 2021) describe the CVP as the strategic articulation of value offered to customers, encompassing both functional and experiential benefits. Another definition of CVP is provided as a strategic tool facilitating communication of an organisation's ability to share resources and offer a superior value package to targeted customers (Payne, Frow and Eggert, 2017).

Methodology

The present research adopts a qualitative approach and relies on multiple case study design in order to address the research questions. Data is collected from managers of four European financial institutions and banks.

Findings

The findings reveal four important value propositions and underline important technical and market-related problems.

- Continuous technological development and customer role
- The need for providing financial information to the customer (need for enhancing financial literacy)
- Different communication styles and approaches of social robots for different customer segments.

Gamification, **professional-rigorous**, **informative and technical, supportive approach-helpful**

- The importance of digital platforms, social media and transparency

In addition, the findings revealed important problems and challenges for social robots' adoption in financial context (lack of financial information, trust issues and technical difficulties).

The Originality

This paper offers a framework that explains the elements and strategic dimensions of value proposition dynamics in financial services (strategically organising and communicating value for competitive advantage).

Research Limitations

This study may be subject to qualitative research limitations.

Theoretical and Practical Applications and Implications

The research describes the characteristics and priorities of CVP for social robots in the financial services industry, a specific industry with its own dynamics and peculiarities (Dibb, Simões and Wensley, 2014) by providing a comprehensive framework of value proposition dynamics (the CVP's critical role and strategies in financial services). The findings may be beneficial to managers, bankers and practitioners in developing strategies and in understanding value proposition dynamics related to social robots in financial services.

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Rituals and cultural branding: young consumers' perceptions of coffee brands in Vietnam and Italy

Vu, Minh[1]; Ceruti, Francesca[2]; Bonera, Michelle[2]

[1]Faculty of Management & Hospitality, Hanoi University, Hanoi, Vietnam

[2] Economics and Management Department (DEM), University of Brescia, Brescia, Italy

Keywords: cultural branding, coffee consumption rituals, young consumers, coffee brands, Italy and Vietnam.

Introduction

Coffee ranks among the world's most pervasive beverages, intricately bound up with daily routines and cultural identities across nations (International Coffee Organization, 2023). Italy and Vietnam present striking contrasts in this domain: Italian coffee habits centre on brisk, rule-bound espresso shots taken standing at the bar, often anchored by venerable brands that cultivate an aura of historical authenticity; Vietnamese traditions, meanwhile, favour unhurried brewing via the Phin filter, laced with creative twists like condensed milk or coconut, and enjoyed in stylish cafés that serve as vibrant "third places" for the consumers (Gorgoglione *et al.,* 2018; Oldenburg, 1989). As coffee houses increasingly emerge as social hubs for young consumers - particularly in a producer market like Vietnam versus a consumer stronghold like Italy - the question arises of how such rituals might underpin effective cultural branding strategies.

Purpose

This research is motivated by the need to better understand the potential of utilising cultural rituals of coffee consumption in building branding strategies for coffee brands, with specific attention to young consumers. The aim of this study is to examine how coffee consumption rituals impact young consumers' perception and preference toward coffee brands in Vietnam and Italy through the lens of cultural branding theory (Holt, 2004).

This research addresses the following research questions:

1. How do young consumers perceive brand myth and product attributes of iconic coffee brands in Vietnam and Italy?

2. How do young consumers perceive and evaluate coffee brand alternatives based on their consumption rituals?

Theoretical framework

The study adopts Holt's (2004) cultural branding model, according to which brands become iconic when they channel identity myths capable of shaping and giving meaning to society. From this perspective, coffee rituals function as performative practices in which national narratives, youth aspirations, and forms of everyday sociality intertwine. This study situates Holt's theoretical framework within Consumer Culture Theory (CCT), which conceptualizes consumption as a socially and culturally embedded practice, shaped by market ideologies, identity projects, and community rituals (Arnould & Thompson, 2005; Thompson, 2022). CCT provides a general perspective through which rituals are understood not simply as behavioral routines, but as meaning-making practices that mediate between individual consumers and broader cultural discourses. In this sense, CCT extends Holt's model by foregrounding the role of lived consumption experiences and community practices in the construction of brand myths, suggesting that, in contexts such as Vietnam, rituals may precede and actively generate brand myths, rather than merely reproducing them. The theoretical framework is further complemented by studies on corporate heritage, which show how "historic" companies leverage their past and values to enhance their credibility (Balmer, 2011; Urde et al., 2007), and by research on ritualized tastes and third places, which highlights the role of coffee brands in building habits and community bonds (Oldenburg, 1989; Quintão et al., 2016). These perspectives present coffee houses as dynamic spaces in which narratives are constantly performed and, at times, cultural. In line with Kapferer (2012), culture thus emerges as one of the six fundamental dimensions of brand identity, which nourishes the roots of long-term equity.

Methodology

Italy and Vietnam were selected through a theoretical replication logic (Yin, 2018), as they occupy structurally different positions in the global coffee system. While Italy represents a mature Western consumption market, Vietnam is a leading Eastern producing country with a rapidly growing in the domestic consumption (International Coffee Organization, 2023). Moreover, Vietnam is the second-largest coffee supplier to Italy (CBI, 2024). This West–East and producer–consumer contrast enables a clearer observation of how culturally embedded

rituals shape branding meanings, compared to more homogeneous country pairings. The choice of these two countries over other possible pairings (e.g., Spain and Thailand, or France and Indonesia) is based on this direct structural relationship: no other pair combines a mature Western consumer market with its main Eastern production supplier, while simultaneously presenting such a divergent ritual landscape. This unique configuration makes Italy and Vietnam the most theoretically productive comparison for examining how culturally rooted rituals shape brand meaning.

To capture how consumption rituals are enacted and negotiated in everyday contexts, this ongoing research adopts an ethnomethodological and qualitative consumer-based approach, consistent with an interpretive constructivist epistemology. Primary data are collected through focus groups with young coffee consumers. Focus groups enable the exploration of collective sense-making among young consumers, particularly appropriate for socially embedded practices (Nyumba et al., 2018), while thematic analysis is applied to identify recurring patterns in ritual performance and meaning construction (Braun & Clarke, 2021). At least four focus groups are planned (two for each country), with an estimated average duration of 75 minutes. Each focus group involves at least 10 participants, and sampling logic is based on geographical location and accessibility. This approach is consistent with recent developments in Consumer Culture Theory, highlighting the interaction between marketplace practices and cultural meanings (Arnould et al., 2019).

Preliminary findings

Anticipated insights reveal rituals' sway over myth interpretation, attribute weighting, and brands' social valence, directly addressing how young consumers perceive brand myth and product attributes. Italian focus group signals portray coffee rituals as short, frequent “daily pulse” routines for habit and socialization, translating into a preference for heritage brands (e.g. Illy, Lavazza), where myth is linked to homely normalcy and professional bar culture, and product attributes are perceived as largely homogeneous, with choices driven by proximity and social interaction. In contrast, Vietnamese rituals are captured as long-duration stays in cafes (2–4 hours) used as multifunctional spaces for social exploration or work, shaping brand myths around experience, aesthetics, and national identity, and differentiating product attributes across usage situations. In terms of CCT (Arnould & Thompson, 2005), these divergent patterns reveal how market practices operate as cultural resources: in Italy, the brevity of the ritual consolidates pre-existing brand myths centered on tradition and authenticity; in Vietnam, the prolonged enactment of the ritual actively generates new brand meanings, making the ritual the primary

site of myth production. These findings suggest that Holt's (2004) model, in which brand myth precedes consumer adoption, may require contextual calibration: in emerging or producer markets, the causal arrow may point in the opposite direction.

These practices also explain how consumers evaluate coffee brand alternatives based on their consumption rituals. Italian participants show low differentiation among brands and favour convenience-oriented choices, while Vietnamese participants distinguish between instant coffee (e.g., G7, Trung Nguyen, Vinacafe) for functional utility, unique local cafes for atmosphere (e.g. Tiny Coffee) and signature drinks (such as Bac Xiu (coffee with condensed milk) and Egg Coffee (Giang Café)), and nearby cafes for social and productive use. The Phin filter, - the signature of Vietnamese coffee (Quintão et al., 2016), remains symbolic rather than functional, and higher willingness to travel reflects experiential evaluation. These findings hint at ritual inertia curbing disruption yet inviting re-mythologizing (Holt, 2004), extending the framework by demonstrating that iconic brand status, in contexts like Vietnam, is actively co-constructed through ritual participation rather than unilaterally authored by brand managers.

Originality and value

The originality of this research lies in its focus on coffee consumption rituals, interpreted within a cultural branding framework and with respect to young consumers. By comparing two distinctive coffee cultures, the study offers a contribution by connecting youth consumption practices, cultural meanings, and branding strategies.

Research limitations

This study presents some limitations. First, the qualitative and exploratory design limits generalisability beyond the sampled contexts. Second, the focus on young coffee consumers may not capture broader national consumption patterns. Future research could extend the analysis to additional cultural contexts, different ages and adopt mixed-method approaches.

Theoretical and practical implications

Theoretically, the research will enrich Holt’s (2004) cultural branding approach by exploring how coffee consumption rituals shape young consumers’ perceptions of consumption myths and product attributes. Practically, it will provide guidance to coffee brand managers for integrating local cultural rituals into branding strategies in contrasting contexts such as Vietnam and Italy.

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EXPLORING AUGMENTED REALITY INITIATIVES WITHIN THE LUXURY FASHION SECTOR: SOUTH EAST EUROPEAN CUSTOMER INSIGHTS

Shilegova, Simona[1]; Kapoulas, Alexandros[2]

BAED, City College University of York Europe Campus, Thessaloniki, Greece[1]

School of Business, University of York Europe Campus, Thessaloniki, Greece[2]

Keywords: Augmented reality, Generation Z, Identity exploration, Digital trust, Digital self-concept, Innovation adoption, Luxury fashion, South East Europe

Abstract

Purpose, aim and objectives: This study explores augmented reality (AR) driven identity exploration and trust as key concepts in the context of Generation Z luxury fashion consumers in South East Europe (SEE). It aims to explore how AR influences self-discovery and new product adoption, while also exploring the role of source credibility and perceived realism in shaping consumer engagement.

Literature review and theoretical framework: The study draws on digital self-concept theory and innovation adoption perspectives to explore how AR-mediated experiences influence identity formation, personalization expectations, and trust in luxury consumption contexts.

Methodology and methods: Qualitative research was conducted, including 20 semi-structured interviews and 100 open-ended online qualitative questionnaires in SEE. Participants were Gen Z consumers from Greece, Bulgaria, North Macedonia and Serbia with prior experience or interest in AR-based fashion/beauty try-on tools and luxury fashion. Data were analysed thematically through coding, theme refinement and cross-country comparison.

Main findings and contribution: AR features encourage style experimentation helping Gen Z consumers discover new looks. Furthermore, AR reduces purchase uncertainty and introduces consumers to products they had not considered, making new product adoption easier. However, limitations in AR realism mean many users still rely on in-person validation before purchasing. Trust and source credibility are crucial factors; participants prefer AR provided by brands themselves and expect better realism before fully relying on it. These

findings contribute to the existing literature by showing that AR's influence on identity exploration and product adoption is conditional upon perceived realism and credible delivery, particularly within the underexplored South East European luxury context.

Originality/value - This study contributes to consumer behavior theory by combining the digital self-concept and innovation adoption perspectives, and it offers invaluable customer insights for marketing management purposes in respect to how luxury brands could potentially integrate AR authentically and improve its credibility to better engage Gen Z luxury fashion consumers in SEE.

Introduction

Augmented Reality (AR) adjusts how people see the physical environment around them by implementing digital data into the real-world perception (Arena et al., 2022). When it comes to the fashion industry, especially in the luxury segment, the application of AR allows consumers to virtually try on clothes, accessories, and make-up – basically visualize products in 3D – which enables companies to deliver a captivating experience for their customers (Nasya et al., 2024). In practical terms, luxury and fashion brands can create these experiences through marker-based filters, marker-less virtual try-ons, 3D product visualization, smart mirrors, mobile AR filters and AI-supported body or face scanning. Recent fashion-retail research identifies examples such as AR footwear try-ons, virtual dressing rooms, smart mirrors and social-media AR filters as mechanisms that make online fashion shopping more interactive and visually informative (Kovács and Keresztes, 2024; Batool and Mou, 2024).

AR has gained significant relevance among Generation Z (Gen Z) consumers – born 1995–2010 – who are digital natives that grew up with smartphones and interactive media (Ngo et al., 2025). Gen Z consumers are tech-savvy and also look for personalization, entertainment and authenticity in their shopping experience, and AR can deliver all of this (Schapsis et al., 2024). Their relevance to luxury fashion is also supported by academic research showing that Gen Z luxury consumption is influenced by social media, peers, opinion leaders and influencer credibility (Sun et al., 2022; Dobre et al., 2021). This does not mean that all Gen Z consumers can afford luxury products, but it shows that they engage strongly with luxury meanings, digital brand communities and aspirational fashion identities.

More specifically, within luxury marketing and consumer behavior research, AR technology influences two key aspects: consumer self-discovery and new product adoption. Consumer

self-discovery is a process in which consumers form and explore their identity, preferences and self-concept through consumption experiences (Bartoli, 2022). Ambika et al. (2023) highlights that AR tools enable the consumer to discover previously unknown sides of their self-concept, making AR experiences especially important for Gen Z, who often use social media filters to explore the question “who am I?”.

Even though the use of AR has increased in recent years, a significant knowledge gap exists regarding how AR marketing experiences contribute to Gen Z consumers’ self-discovery process and willingness to adopt new products, particularly in South East Europe. Much of the existing literature has focused on AR in fashion on Western markets and on quantitative studies of AR technology acceptance and purchase intention which is why very little is known from a qualitative perspective about AR’s impact on Gen Z consumers’ identity formation, brand relationships and decision making in countries like Greece and Bulgaria (EU countries) versus North Macedonia and Serbia (non-EU) (Sarkis et al., 2025). The four countries were selected because they represent a small but meaningful SEE comparison between EU and non-EU markets with shared regional cultural proximity but different market integration, digital-commerce maturity and luxury retail access.

Therefore, this research aims to explore how AR experiences in digital marketing shape Gen Z consumers’ self-discovery and adoption of new luxury fashion products in South East Europe, and what roles digital trust, source credibility, realism and personalization play in these processes. The research questions were reframed to align more directly with the empirical scope of the study:

RQ1: How do Gen Z consumers in South East Europe describe the role of AR luxury fashion experiences in identity exploration, self-expression and personalization?

RQ2: How do perceived realism, digital trust and source credibility shape Gen Z consumers’ willingness to engage with AR and consider adopting new luxury fashion products?

RQ3: What similarities and differences emerge between EU and non-EU SEE participants in their exposure to and evaluation of AR luxury fashion experiences?

Literature Review

Gen Z, digital identity & self-discovery in luxury fashion

AR plays a significant role in the identity of Gen Z consumers, as younger generations can see themselves in different looks and personas. Ambika et al. (2023) concluded that digital tools enable the discovery of previously unknown facets of the consumers' self-concept. In other words, by using AR tools, consumers are given the opportunity to explore "who I might be" by trying out different hair colours, cosmetics and fashion items that they had not considered before. Kim and Im (2023) further explain that when consumers use AR technology to try on products, they perceive their self-concept as more malleable, meaning they can see how they transform their look and style more easily than before. The researchers also highlight that AR leads to better self-brand connection, as users visualize a new version of themselves associated with the brand's products. The AR virtual try-ons support the self-identity of consumers by enabling autonomy, self-expression and self-referencing in their shopping experience (Lavoye et al., 2023). For Gen Z consumers, wearing a virtual luxury product and sharing such images on social media provides identity value, where they express their style and affiliation with luxury brands even though they do not physically own the product (Dobre et al., 2021). Further studies have identified that Gen Z consumers treat their digital appearance as an important part of themselves (Sitompul, Noviani and Sembiring, 2023). Moreover, Milanesi et al. (2024) revealed that Gen Z consumers feel "more like themselves" when using digital fashion products, which supports the idea that Gen Z finds comfort and authenticity in virtual self-discovery. The literature suggests that AR is among the important factors in Gen Z's self-discovery process, allowing individuals to explore who they might be through virtual luxury brand experiences.

At the same time, Gen Z's interest in luxury should be understood as both economic and symbolic: academic work on luxury fashion consumption shows that social media influencers, peers, celebrities and opinion leaders can shape Gen Z luxury attitudes and purchase-related behaviour (Sun et al., 2022). Thus, luxury fashion is relevant not only as a purchase category but also as a digitally mediated space of aspiration, social signalling and identity construction.

Digital trust, source credibility, realism and accuracy in augmented reality

Even though AR deepens the connection between consumers and brands, there are still many issues regarding the trustworthiness of AR content and the credibility of its sources. Gen Z

consumers are known to value authenticity, and their willingness to engage with AR for new product discovery and adoption may weaken depending on how much they trust the content and its provider. For this study, digital trust refers to the consumer's confidence that the AR tool represents the product accurately, uses data responsibly and comes from a reliable provider. Source credibility refers to the perceived trustworthiness, expertise and authenticity of the platform, brand or influencer delivering the AR experience.

AR in marketing can raise multiple trust questions, such as: "Is the AR filter accurate and realistic?"; "Who is providing this AR content, and does the consumer trust it?"; "What data is the consumer giving up to use AR?". Recent studies suggest that digital trust is crucial for AR marketing success. Taub et al. (2024) found that users trusted statements accompanied by AR visuals more than those with a static image. However, this applies only if the AR feature is not misleading; if an AR feature does not match reality, consumers may feel deceived. This is why accuracy in a brand's AR features is so important. In the luxury fashion context, where purchase decisions carry higher risk, it is crucial for a brand to have trustworthy AR technology that accurately represents fit, colour and style in order to gain Gen Z's trust in the digital environment.Another important factor is source credibility. Gen Z consumers may perceive content differently depending on whether AR is delivered by an official brand application, an e-commerce platform, an influencer or a social-media filter. Sun et al. (2022) show that social media actors can influence Gen Z luxury fashion consumption, while Singer et al. (2023) note that perceived influencer authenticity shapes persuasiveness. Building trust and credibility in the use of AR tools, therefore, is a must when conducting a digital marketing campaign. The AR experience should not only be entertaining, but also reliable and transparent in how businesses portray their products. The intersection of digital trust, source credibility, realism and AR marketing highlights that without trust, even the best AR tools cannot be fully effective for engaging Gen Z consumers (Taub et al., 2024). This suggests that companies need to design AR experiences based on trust and deploy them through channels that Gen Z finds credible. Accordingly, this study further explores how Gen Z's trust in AR tools influences their willingness to use such technologies for product discovery and purchase.

Methodology

This study implemented multiple qualitative methods. The first method was semi-structured interviews (an exploratory interview technique commonly used in social sciences).

Semi-structured interviews are guided by a set of key topics but allow the researcher to probe deeper as new insights emerge (Ruslin et al., 2022). Such interviews can be used in early stages of research design to formulate and clarify research questions (Adeoye‐Olatunde & Olenik, 2021). The second method was open-ended online questionnaires, in which participants can provide in-depth answers in their own words (Bielska et al., 2024). The combination of these two approaches enabled data triangulation, which is very important to ensure that findings can be used confidently (Bans-Akutey & Tiimub, 2021).

Data Collection: In-depth semi-structured interviews were conducted with Gen Z consumers in Greece, Bulgaria, North Macedonia and Serbia, gathering detailed stories and examples of their experiences with AR in luxury fashion. The interview guide included structured questions covering identity exploration, personalization, trust, realism and platform credibility. The detailed interview and questionnaire guide is available from the author upon request. The interviews were conducted online and in-person, audio-recorded with participant consent, and later transcribed for analysis. The open- ended online questionnaires were distributed to a larger sample of Gen Z consumers in the same four countries. Using both methods ensured breadth through questionnaires and depth through interviews.

Sampling and Participants: The participants in this study were Generation Z consumers (born 1996–2007) from the four South East European countries mentioned. These countries were selected to include a mix of EU and non-EU markets. For the sampling process, participants needed to have some experience using AR in luxury fashion or beauty, like virtual try-ons and AR filters, and an interest or involvement in luxury fashion. In total, 100 online questionnaires were completed - 25 per country – and 20 interviews were conducted in total - 5 per country. The participant pool therefore consisted of 120 Gen Z respondents across four national contexts. Participants were recruited through purposive and snowball sampling, with eligibility based on age cohort, country of residence, familiarity with AR try-on or filter tools, and relevance to luxury/fashion consumption. Because the study focused on qualitative depth rather than statistical representation, the sample should be interpreted as exploratory rather than representative of all SEE Gen Z consumers.

In reporting the results, interview participants are referenced as Respondent X (with X being an interview number), and questionnaire participants are referenced as Participant X (with X being an questionnaire number), to maintain anonymity.

Data Analysis: The data analysis for this research followed a thematic analysis approach, an analytical technique that qualitative researchers use to identify patterns across a dataset by organizing data into themes and sub-themes (Naeem et al., 2023). First, interview transcripts and questionnaire responses were read repeatedly for familiarisation. Second, initial codes were assigned to recurring ideas such as experimentation, personalization, realism, trust, platform credibility and purchase confidence. Third, similar codes were grouped into themes and checked against the research questions. Fourth, themes were compared across the four countries to identify shared patterns and minor EU/non-EU differences. To reduce analytical bias, the researcher kept an audit trail of coding decisions, compared interview and questionnaire evidence before finalising themes, used anonymised participant labels and prioritised repeated patterns rather than isolated statements.

Findings

This section presents empirical findings only. Citations and theoretical interpretation have been moved to the Discussion section.

AR as a tool for self-discovery & identity formation

Many participants described their AR experience as a safe way to explore new looks that they would not normally consider. Respondent 19 (Serbia) said: "*I've tried some lipstick colors through AR that I never would have considered before*"; Respondent 14 (Serbia) noted that AR let them "*explore bold choices because I can preview them, so then I don't feel like I will make a problem if I actually choose something.*" Similarly, Participant 5 (North Macedonia) said: "*AR experiences like virtual try-ons and beauty filters have allowed me to experiment with different looks easily, helping me discover new styles and feel more confident about my choices.*" Even though some participants found AR to be a good tool for self-discovery, others felt that AR had little to no impact on their personal style or sense of identity. Respondent 10 (Bulgaria) explained: "*I don't think I have been very influenced by AR experiences. I am doing it more from curiosity... to actually try something.*" For these consumers, especially those engaging less frequently with AR, the technology remains a curious tool with minimal effect on their identity. The lack of realism makes it hard for users to truly imagine an AR look as part of their real identity. Respondent 13 (Bulgaria) mentioned: "*It's not a complete replacement for an actual in-store experience where you can go, try it on*."

Personalization of the AR experience

Many participants did not perceive current AR shopping tools as highly personalized. Participants felt that AR experiences were more "*one size fits all*" rather than tailored to their individual features or preferences. Respondent 13 (Bulgaria) said: "*If you are slimmer or if you're overweight, they cannot see that, and maybe things are gonna look different*" and Respondent 4 (Serbia) said that "*most still seem general and not fully adapted to my personal features or preferences.*" Other examples from the questionnaires include: "*I don't think they are personalized, it didn't scan my face properly*" (Participant 98 - Greece). On the other hand, a few participants did perceive some level of personalization in AR. Respondent 8 (Greece) stated that "*the whole concept of it is to personalize the product… they connect how the product will look to how I look… So, as long as it works, it does the job very well.*" For this respondent, seeing how products will look, even if not perfect, still gives a sense of personalization. Most AR consumers in this research also expressed a strong desire for better, more advanced personalization in AR marketing. Respondent 5 (Serbia) said: "*I think brands should focus on making AR more realistic and body specific. For example, if we could scan our body shape so we can really see how clothes would fit on us and certain body types.*" Participant 57 (Serbia) said: "*I'd like features that show accurate fit, color, and maybe suggestions tailored to my style, so it feels more personal and worth trying.*"

Realism, accuracy and trust in AR try-ons

Almost every participant highlighted that there is a lack of realism in their AR experiences. Even though the participants found AR interesting, they often did not feel that AR features were fully reliable. Respondent 2 (Bulgaria) said: "*They're not really precise. I mean, it gives you an overview, but it's not giving you an accurate, 100% accuracy*" and Participant 2 (North Macedonia) mentioned, "*I think that there are accurate try-ons and filters, but there are a lot of AR features that don't look realistic.*" Other participants gave specific examples of what is not realistic enough. Respondent 5 (Serbia) said: "*with clothing, or some other detailed, luxury items, I don't think it's accurate enough.*" The perceived realism differed by product category. Respondent 13 (Bulgaria) observed: "*It's good for basic things like sunglasses, maybe make-up for the women... But in some cases, it could be less accurate for clothes.*" Current limitations in realism directly impact user trust in AR. Respondent 6 (Greece) said that "*you cannot understand the product so much, it's still not the same as trying on site.*" These doubts suggest that, in the context of luxury fashion, AR try-ons currently function as

an additional tool rather than a replacement for in-person inspection. On the other hand, when consumers do find an AR experience realistic, the impact can be powerful. Respondent 18 (North Macedonia) shared that they purchased a product because the brand's AR feature looked realistic: "*I bought those RayBans, I used their AR and I ended up buying the same exact model. It was just very good.*"

Social influence and source credibility in AR adoption

A lot of participants suggested that luxury brands can enhance AR's awareness and credibility through celebrity or influencer endorsements and strong social media campaigns. Respondent 13 (Bulgaria) noted that "*brands might need to do some celebrity endorsements and work with celebrities just to market it [AR] better.*" Beyond endorsements, the source credibility of the platform itself also mattered. Gen Z participants from South East Europe noted that Instagram and official brand applications/websites were the most trustworthy options. Respondent 4 (Serbia) said: "*I would say that I prefer AR on Instagram or brand apps because they feel reliable and convenient.*" Participant 78 (North Macedonia) wrote, "*Instagram and brand apps are preferred for AR because they feel more polished, easier to use, and better aligned with luxury branding.*" In contrast, a large group of participants thought that "*Snapchat is fun, but less trustworthy for serious [shopping] decisions."*

Cross-country observations

The findings suggest more similarities than differences across the four countries. Participants from all countries valued experimentation but questioned realism, sizing accuracy and trust. Minor differences appeared in exposure and channel preference: non-EU participants reported slightly higher curiosity toward influencer-promoted AR tools, while EUparticipants more often linked AR credibility to official brand websites or applications. These differences should be treated cautiously because the sample is qualitative and exploratory.

Discussion

AR provides a safe and creative space for style experimentation, with low risk to try new looks or products. Many participants mentioned that they tried new styles because AR gave them confidence, which corresponds with the idea that AR can ease the consumer's self-discovery by making the process more enjoyable and fun. This aligns with Kim and Im's (2023) argument that virtual try-ons can increase self-concept adaptivity and with Lavoye et

al.'s (2023) view that virtual try-on experiences support self-explorative engagement. However, the findings also show that this self-discovery effect is conditional rather than automatic. Some participants saw AR only as a playful tool, suggesting that identity-related outcomes depend on the quality and credibility of the AR experience. Personalization emerged as a major limitation. Although AR is often presented as a personalized technology, participants frequently described current tools as generic. This supports Schapsis et al. (2024), who argue that Gen Z consumers expect personalization, entertainment and authenticity in digital shopping, and it also reinforces the importance of accurate body and product visualization highlighted in recent virtual try-on research (Batool and Mou, 2024; Chen, Ni and Zhang, 2024). For luxury fashion, weak personalization is especially problematic because luxury consumption relies on fit, aesthetic precision, symbolic value and emotional confidence. Consumer trust is central to AR adoption. Most participants did not find AR accurate enough to replace in-person shopping, particularly for clothing and detailed luxury products. This finding aligns with Taub et al. (2024), who show that AR can increase trust when it supports a "seeing is believing" effect, but also with Nawres et al. (2024), who suggest that AR effects vary across luxury product categories. In this study, AR appeared more convincing for lower-fit-risk products such as sunglasses or make-up than for clothing, where tactile and sizing uncertainty remains high. Source credibility also shaped participants' willingness to rely on AR. Participants often trusted official brand applications or websites more for serious purchase decisions, while Instagram and Snapchat were associated with fun, exploration and social sharing. This supports research on Gen Z luxury consumption showing the importance of social media actors and influencer credibility (Sun et al., 2022; Singer et al., 2023). However, this study adds nuance: influencers may improve awareness and social desirability, while official brand channels may be more important for final purchase confidence.

Theoretical Contribution

This study contributes to digital self-concept theory by showing that AR can support identity exploration among Gen Z consumers, but mainly when the experience feels realistic, personalized and credible. It therefore challenges an inevitable view of AR as automatically transformative and instead positions AR as a conditional identity tool. The study also contributes to innovation adoption research by identifying perceived realism and source credibility as key trust-building mechanisms in AR-enabled luxury fashion adoption. In the

SEE context, AR adoption is not only a question of technological novelty or usefulness; it also depends on whether the consumer believes that the digital representation is accurate enough to support a high-involvement luxury decision.

Managerial Implications

Luxury fashion managers should treat AR as part of the wider customer journey rather than as a standalone entertainment feature. AR can create discovery and engagement, but purchase confidence requires accurate fit, realistic colour, credible platform delivery and clear product information. Brands should prioritise official AR tools on brand websites or applications for purchase-oriented experiences, while using Instagram, TikTok or influencer-led AR activations for awareness, experimentation and community engagement. Influencer collaborations should be selected based on credibility and fit with the brand image, not only reach. Managers should also invest in more advanced personalization, including body-specific scanning, skin-tone sensitivity, realistic fabric movement and transparent data-use communication. These improvements can increase trust and reduce the gap between online experimentation and offline purchase validation.

Limitations

This study is qualitative and exploratory, so the findings cannot be generalised statistically to all Gen Z consumers in South East Europe. The sample includes participants with some familiarity with AR and interest in fashion/luxury, which may overrepresent digitally engaged consumers. The country comparison is also limited because the number of interviews per country was small. Therefore, EU and non- EU differences should be interpreted as indicative patterns rather than definitive national differences. Finally, the study focused mainly on trust, realism, source credibility and identity exploration; data privacy concerns were not explored in depth.

Future Research

Future research could use a mixed-methods design to test the relationships between perceived realism, source credibility, digital trust and purchase intention across larger samples. Comparative research could also examine whether SEE consumers differ from Western European consumers in AR adoption, luxury aspiration and trust in brand-led versus

influencer-led AR. Future studies should also investigate data privacy and consent in AR luxury fashion, especially where face scanning, body scanning or AI-based personalization are involved. Future research could also examine whether improvements in AR realism over time lead to deeper self-discovery, stronger brand relationships and higher luxury product adoption.

Conclusion

This study combines the digital self-concept and innovation adoption perspectives, enriching theory with culturally diverse insights from South East Europe. It provides qualitative evidence that AR can serve as a tool for Gen Z identity exploration, contributing to digital self-concept theory, while also reinforcing that AR features must be credible and realistic. The findings demonstrate that AR's impact is not automatic, but conditional upon perceived realism, personalization and source credibility. In particular, technical realism appears to function as a key factor that determines whether AR remains a playful engagement feature or becomes a meaningful influence on purchase decisions. Managers should integrate AR authentically into the customer journey, focusing on technical realism to build trust and deepen brand affinity. Future research should broaden qualitative inquiry to other emerging markets and use mixed methods to compare Gen Z's AR experiences across cultures.

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THE INFLUENCE OF COMPENSATION INEQUITY ON CEO RETENTION

Rainville, Gabrielle[1]; Papadopoulos, Andrew[1]

[1]École des Sciences de la Gestion / UQAM, Montréal, Canada

Keywords: CEO, Retention, Inequity, Compensation, Performance

Introduction

Although CEO compensation is widely scrutinized, research has seldomly investigated how a CEO's *comparative* market position in actual total direct compensation (TDC) - not potential compensation - impacts the likelihood of resignation.

Purpose, Aim and Objectives

We explore whether CEOs are more likely to resign when TDC is misaligned with comparable CEOs.

Literature Review and Theoretical Framework

Grounded in Adams's equity theory (1963, 1965), Greenberg's organizational justice (1990), Vroom's expectancy theory (1968) and Lawler's discrepancy model (1971), we posit that CEOs evaluate their actual compensation relative to external referents to determine fairness, influencing their motivation and retention. Equity theory suggests that being relatively underpaid should increase dissatisfaction and departure. Organizational justice and expectancy theory propose that perceived fairness is central to behavioural outcomes; high CEO self-efficacy and strategic contribution should react strongly to such perceptions. Consequently, adverse external inequity in TDC increases the probability of CEO resignation.

Methodology and Methods

We employ a longitudinal design covering S&P/TSX60 Canadian firms from 2015–19 from publicly available sources. After excluding founder-CEOs and those holding more than 5% ownership, the final sample consists of 55 CEOs across 42 firms (210 CEO-years). The binary dependent variable is voluntary resignation while the key independent variable is external inequity in TDC (percentage deviation of a CEO's paid TDC from the market median). Additional independent control variables include age, short-term incentives, long-term

incentives (LTI), pension plan type, perks, company revenues, net income, share price performance, and market capitalization ranking.

Findings and Contribution

Only three resignations occurred over the five-year period, a rate consistent with the "stickiness" of CEO roles at large corporations. A logistic regression assessing resignation probability shows that inequity remains significant at the 90% confidence level ($p = 0.064$). Favourable inequity reduces resignation likelihood (odds ratio = 0.001), whereas the monetary value of perks increases resignation likelihood (odds ratio = 2.812). Our results confirm that both favourable and unfavourable forms of external inequity in TDC influence CEO retention; explanatory power remains modest due to few resignations.

Originality and Value

While prior studies focus on target compensation or cash pay, this research analyzes compensation received. By linking equity theory and organizational justice to executive retention, it addresses a clear empirical gap in shifting the debate from "how much CEOs earn" to "how relative pay positioning influences strategic turnover risk". External compensation matters as unique labour market dynamics often obscure behavioural determinants.

Research Limitations

Practically, the results underscore the importance for compensation committees of monitoring competitive pay positioning, especially given the heavy reliance (85% of TSX60 firms) on external compensation consultants. Firms should recognize that both under- and over-compensation relative to the market can influence CEO mobility, and that long-term incentives play a central role in shaping perceived equity.

Theoretical and Practical Implications

We extend Adams' equity theory by applying it to top executives and external market comparisons rather than internal referents. It also integrates insights from Jerald Greenberg's organizational justice framework and expectancy theory, showing that distributive perceptions at the market level can influence voluntary departure decisions. The findings suggest that even highly compensated CEOs respond to perceived under- or over-equity. Theoretically, this

nuances assumptions that executives are driven primarily by absolute pay levels, reinforcing the importance of relative positioning in compensation research and governance studies. Practically, the findings signal to boards and compensation committees that market positioning matters—not only for attraction but for retention by considering how deviations from median pay may shape CEO exit risk. Although pay inequity explains only a limited portion of resignation probability, it is a controllable governance lever. The broader message is disciplined design: compensation strategy should balance competitiveness, fairness perceptions, and long-term organizational performance, rather than reacting mechanically to peer escalation pressures.

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MEASURING WORKPLACE HAPPINESS: EMPIRICAL VALIDATION OF THE GASP MODEL

Di Prima, Christian[1]

[1]Dipartimento di Management "Valter Cantino", Università degli Studi di Torino, Unito, Turin, Italy

Keywords (up to 10): workplace happiness; employee wellbeing; exploratory factor analysis (EFA); scale development

Happiness has increasingly gained attention in organizational research as a critical factor influencing employee well-being, engagement, performance, productivity, commitment, and turnover (Diener, 2000; Fisher, 2010; Warr & Nielsen, 2018). Despite this, organizational happiness is often addressed through fragmented constructs, without a comprehensive framework integrating both individual and organizational levels.

To address this limitation, the GASP model was recently proposed as a multidimensional framework conceptualizing workplace happiness as a dynamic process built on four core pillars: Godersela (enjoying experiences), Accogliere (embracing challenges and learning), Sognare (goal orientation and shared vision), and Persone (relationships and social connection). These operate simultaneously at two interconnected levels: the individual level, reflecting employees' psychological experience of work, and the organizational level, reflecting organizational practices and cultural dynamics supporting well-being. The conceptual foundations of the model draw from several established research streams: positive psychology, highlighting the importance of subjective well-being, positive affect, and meaningful engagement in promoting human flourishing (Diener, 2000; Seligman, 2011); Self-Determination Theory (Deci & Ryan, 2000), emphasizing the importance of autonomy, competence, and relatedness in fostering well-being; the Job Demands–Resources model, highlighting the role of supportive organizational environments in sustaining employee motivation and engagement (Bakker & Demerouti, 2017). The GASP integrates them by proposing a multidimensional structure of happiness combining hedonic enjoyment, psychological acceptance, future-oriented motivation, and relational connectedness, translating these psychological dimensions into actively manageable organizational practices.

This study pursues three objectives: to develop reliable measurement scales capturing the four GASP dimensions at individual and organizational levels; to investigate the factorial structure

of the scales through exploratory factor analysis (EFA); to assess the internal consistency and reliability of the resulting constructs and their relationship with general happiness.

Data were collected through 351 surveys administered to employees participating in GASP training programs within Italian organizations. EFA were conducted using Principal Axis Factoring with oblique rotation in IBM SPSS, following methodological recommendations for scale development (Fabrigar et al., 1999; Costello & Osborne, 2005). Sampling adequacy was assessed using the Kaiser–Meyer–Olkin statistic and Bartlett's test of sphericity. Item refinement was conducted iteratively based on communalities, factor loadings, cross-loadings, and reliability diagnostics. Internal consistency of the resulting scales was assessed using Cronbach's alpha (Nunnally & Bernstein, 1994).

The analysis confirmed the framework robustness. The general happiness scale demonstrated a clear unidimensional structure and excellent reliability ($\alpha \approx .90$). For the individual-level scale, iterative EFA procedures resulted in a refined four-factor structure consistent with the theoretical model. Items showing cross-loadings or weak contributions were removed, resulting in reliable subscales for the four dimensions (α from .79 to .84). The organizational-level scale showed extremely high sampling adequacy and strong internal consistency. Although the factor structure revealed a dominant general organizational factor, a four-dimension solution corresponding to the theoretical GASP pillars remained interpretable. Reliability coefficients were particularly high for the organizational dimensions (α from.92 to .97). Overall, the results support the multidimensional nature of workplace happiness and confirm the feasibility of measuring GASP constructs at individual and organizational levels.

This research provides one of the first attempts to operationalize workplace happiness through a dual-level measurement framework, integrating individual psychological experiences and organizational practices; from a practical standpoint, it offers validated measurement scales that organizations can use to systematically assess, monitor and foster workplace happiness.

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ADAPTIVE LEADERSHIP IN TURBULENT ENVIRONMENTS: BUFFERING ORGANIZATIONS FROM EXTERNAL SHOCKS

Palmucci, Dario Natale[1]; Di Prima, Christian[1]

[1]Dipartimento di Management "Valter Cantino", Università degli Studi di Torino, Turin, Italy

Keywords: Leadership; Human Resources, Socio-politic challenges; STP leadership

Introduction

In recent years, organizations have been operating in an environment characterized by unprecedented levels of socio-economic, political, and geopolitical turbulence. Digital disruption, post-pandemic instability, climate crises, geopolitical conflicts, inflationary pressures, and rapid regulatory changes have profoundly altered organizational landscapes across all sectors (Vrontis et al., 2024). In this context, businesses in general and leadership in particular are no longer concerned solely with guiding internal transformation processes, but increasingly with protecting organizations from external volatility (Flint, 2021). It is to say that while recent models have emphasized sustainability, technology, and people as core areas of intervention (Palmucci et al., 2025), less attention has been devoted to the buffering role of leadership in absorbing external shocks and preserving organizational stability (Patsiaouras et al., 2026). The purpose of this study is to evaluate whether a recently proposed leadership model (e.g., STP Sustainability–Technology–People) which is focused on challenges and skills of the nowadays leaders (Palmucci & Ferraris, 2026) can be integrated in light of contemporary socio-economic and political disruptions. In other words, the aim is to explore whether the STP framework sufficiently captures the challenges faced by leaders in highly turbulent environments and/or whether additional dimensions and skills are required. Specifically, the objectives are: (i) to analyze the adequacy of STP leadership in addressing external turbulence; (ii) to identify missing leadership capabilities related to environmental uncertainty management; and (iii) to propose an extended conceptualization of leadership that incorporates a protective and stabilizing function.

Literature review and theoretical framework

Leadership studies have progressively evolved from traditional, hierarchical approaches toward more relational, adaptive, and human-centered models (Stone & Patterson, 2023). Within this stream of research, existing theories emphasize different dimensions of leadership, including leader–follower relationships (e.g., transformational and transactional leadership; Sarros & Santora, 2001), leaders' personal characteristics and values (e.g., servant and inclusive leadership; Gotsis & Grimani, 2016), contextual adaptability (e.g., situational leadership; Thompson & Vecchio, 2009), as well as innovation and digitalization processes (e.g., innovative and digital leadership; Erhan et al., 2022). Building on this body of research, the STP leadership model has been proposed to address this gap by integrating sustainability, technology, and people as the main areas of intervention for contemporary leaders, and by associating these domains with six key leadership skills: strategic thinking, flexibility, authenticity, coaching, change management, and inclusiveness (Palmucci et al., 2025). However, despite its relevance and its alignment with many of the challenges faced by today's leaders, the model seems to primarily focuses on internal organizational dynamics and implicitly assumes a relatively stable external environment – and prior studies have already highlighted that the most recognized leadership theories have not been extensively examined within global business studies (Ramsey et al., 2017). On this direction, this study argues that current socio-economic and geopolitical conditions require leaders to move beyond the role of change enablers and to act as shock absorbers, capable of filtering, interpreting, and mitigating external turbulence before it destabilizes organizational systems.

Methodology and main expected findings

The study adopts a research design consistent with prior studies that have examined and validated the STP model in different contexts (e.g., "Strategic management in the public sector: new leadership models to navigate the turbulent post-Covid era" - Palmucci et al., 2025). It combines a critical analysis of recent leadership literature with insights derived from interviews with organizational actors operating in complex and turbulent environments. The study is expected to show that, while sustainability, technology, and people remain fundamental pillars of contemporary leadership, they may not be sufficient to fully address the challenges posed by systemic turbulence. The analysis is anticipated to reveal the relevance of an additional, currently underexplored leadership domain, which can be defined as "environmental buffering". This domain is expected to capture the leader's ability to interpret

external signals, manage uncertainty, absorb shocks, and shield organizational members from destabilizing external pressures. If this will be found, then additional skills associated with this buffering function, including sensemaking, geopolitical and socio-economic awareness, anticipatory decision-making, emotional containment, and the orchestration of organizational resilience, could be identified. These competencies are expected to extend beyond the original framework and to reconceptualize leadership as a stabilizing force operating at the boundary between the organization and its environment.

Originality, research limitations and implications

This study is expected to contribute to leadership research by explicitly incorporating external turbulence into leadership theorization, potentially advancing a more holistic and realistic understanding of contemporary leadership challenges, and, most important, encouraging scholars to more explicitly integrate environmental instability into leadership models. It is to say that the proposed extension of the STP model is anticipated to respond to growing calls for leadership frameworks that better reflect the volatility, uncertainty, complexity, and ambiguity characterizing today's global context. Given its exploratory nature and the anticipated qualitative orientation, the study is not expected to produce statistically generalizable results. Rather, it may offer insights that future research could further examine through quantitative designs across different sectors and national contexts. In addition, longitudinal studies could be conducted to investigate how buffering capabilities evolve over time in response to prolonged and recurring turbulence. From a practical standpoint, it may suggest that leadership development programs should move beyond sustainability-, digital-, and people-related skills, incorporating training focused on crisis anticipation, uncertainty management, and organizational protection. In this sense, leaders may increasingly be required not only to transform organizations, but also to safeguard them in an increasingly unstable environment.

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THE EMOTIONAL INTELLIGENCE OF THE TRANSFORMATIONAL LEADER AS A CATALYST FOR CREATIVITY AND ORGANIZATIONAL INNOVATION: A SYSTEMATIC LITERATURE REVIEW

Tselezidou Sofia[1], **Stafyla Amalia**[2], **Siachou Evangelia**[3]

[1,2]Department of Supply Chain Management, International Hellenic University, Katerini, Greece

[3]Department of Economics, National and Kapodistrian University of Athens, Athens, Greece

Keywords: Emotional Intelligence; Transformational Leadership; Creativity; Innovation; Systematic Literature Review

Introduction and Scope

Emotional intelligence (EI) has emerged as a critical capability for contemporary leadership, particularly within increasingly complex and innovation-driven organizational environments. Over the past decades, research has highlighted the importance of leaders' emotional competencies in shaping team dynamics, improving decision-making, and fostering creative and innovative outcomes.

Transformational leadership (TL), which emphasizes inspiration, vision, and individualized consideration, has been consistently associated with higher levels of employee engagement, creativity, and innovation. However, the mechanisms through which emotional intelligence enhances transformational leadership and ultimately contributes to organizational innovation remain an area of ongoing scholarly investigation.

The present study aims to synthesize the existing literature and explores how emotional intelligence functions as a catalyst enabling transformational leaders to promote creativity and innovation within organizations.

Methodology and Methods

This research adopts a Systematic Literature Review (SLR) methodology based on the framework proposed by Webster and Watson (2002). The review focuses on identifying and analyzing academic research that examines the relationship between emotional intelligence, transformational leadership, and innovation-related outcomes. Articles published between 1998

and 2026 were considered, as this period captures the major theoretical and empirical developments in the study of emotional intelligence in leadership contexts. The study follows a three-phase search strategy: (a) initial identification across ScienceDirect, Scopus, and Elicit using Boolean operators for keywords (EI, TL, innovation), (b) backward and forward citation tracking to ensure literature saturation, and (c) strict quality screening. The final corpus of 95 relevant peer-reviewed articles was analyzed using a "concept-table" approach to categorize findings into thematic clusters, ensuring a rigorous research design. Data extraction focused on identifying mediating variables and thematic clusters that link emotional competencies to innovative outputs.

Main Findings

The thematic synthesis of the 95 selected studies reveals that EI functions as a multi- level catalyst through three primary mediating mechanisms.

1. The psychological safety pathway: Leader's emotional regulation reduces fear of failure, allowing for risk-tasking and idea generation.
2. High – Quality LMX (Leader-Member-Exchange): Trust based relationships, rooted in empathy, facilitate the flow of non-redundant information.
3. Collective learning climates: EI driven transformational leadership fosters knowledge sharing and team adaptability.

The literature consistently demonstrates that emotionally intelligent leaders possess the ability to recognize, understand, and regulate both their own emotions and those of others, which enables them to activate the core dimensions of TL- idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Asmamaw and Semela, 2023; Por Pan *et al*., 2020; Saini and Goswami, 2019). Through these leadership behaviors, emotionally intelligent leaders inspire followers to transcend personal interests and align with collective organizational goals.

The theoretical foundation of emotional intelligence originates from the ability-based model developed by Mayer and Salovey (1995), which conceptualizes EI as a set of cognitive-emotional abilities. These abilities include emotion perception, emotion facilitation, emotional understanding, and emotional regulation. These competencies allow leaders to process emotional information effectively and use emotions strategically in decision-making and

interpersonal relationships (Mayer, Salovey and Caruso, 1999). In organizational settings, such capabilities enhance leaders' ability to communicate vision, manage conflict, and support employee development.

A key mechanism identified in the literature linking emotional intelligence and organizational outcomes is the development of high-quality leader–member exchange (LMX) relationships. Emotionally intelligent transformational leaders are more capable of establishing trust-based relationships with employees, characterized by mutual respect, open communication, and psychological safety (Hur *et al*., 2011; Gooty *et al*., 2010). High-quality LMX relationships create an environment in which employees feel valued and supported, encouraging them to share ideas, experiment with new approaches, and engage in innovative work behavior.

Furthermore, emotionally intelligent leadership contributes to team-level processes that facilitate innovation. Studies indicate that EI-driven transformational leadership enhances collective learning, knowledge sharing, and psychological safety within teams. These conditions are critical for creativity because they allow individuals to express novel ideas without fear of criticism or failure. By promoting emotional awareness and supportive interpersonal relationships, leaders foster collaborative climates that support experimentation and creative problem-solving.

The literature also suggests that the effectiveness of emotionally intelligent transformational leadership may depend on contextual factors such as organizational culture, industry characteristics, and the level of digital transformation. For instance, organizations operating in knowledge-intensive or technology-driven sectors may benefit more significantly.

Overall, the findings of this review support the view that EI plays a catalytic role in transformational leadership processes that ultimately lead to organizational creativity and innovation. Emotionally intelligent leaders influence innovation indirectly by strengthening leader–member relationships, fostering psychological safety, and promoting collaborative team dynamics. By integrating emotional intelligence with transformational leadership behaviors, organizations can create environments that support learning, adaptability, and innovation.

Study's Implications and Future Research

This study contributes to the leadership and innovation literature by synthesizing empirical evidence on the mechanisms linking emotional intelligence, transformational leadership, and organizational innovation. Future research should explore multi-level and dynamic models that examine how emotional intelligence operates across individual, team, and organizational levels. Additionally, researchers are encouraged to investigate emerging contexts such as digitally transformed organizations and hybrid work environments, where emotional competencies may play an increasingly important role in leadership effectiveness and innovation performance.

To address the limitations of relying on secondary data, future research should transition toward an empirical research design. We propose conducting a primary study using a mixed-methods approach, involving structured interviews with transformational leaders. This will allow for the empirical validation of the identified EI-innovation mechanisms in real-world, industry-specific contexts.

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THE ADOPTION OF SUSTAINABLE AGRICULTURAL PRACTICES ACROSS MEDITERRANEAN COUNTRIES: AN INVESTIGATION OF STAKEHOLDERS' SUBJECTIVITY

Mirabella, Claudio[1]; Agosta, Martina[2]; D'Acquisto, Marcello[3]; Schimmenti, Emanuele[1]; Crescimanno, Maria[1]; Borsellino, Valeria[1]

[1]Department of Agricultural, Food and Forestry Sciences, University of Palermo, Palermo, Italy

[2]Council for Agricultural Research and Agricultural Economics Analysis (CREA-PB), Agricultural Policies and Bioeconomy, Rome, Italy

[3]Department of Agriculture, Rural Development and Mediterranean Fisheries, Regione Siciliana, Palermo, Italy

Keywords: Intercropping, Sustainability, Cross-Country Analysis, Q Methodology, Factor Analysis, Mixed Methods, Technology Acceptance

Introduction

Mediterranean regions are among those most exposed to climate change (Lazoglou et al., 2024), facing rising temperatures, soil degradation and extreme events that threaten food security (Alrteimei et al., 2022). Intercropping, the simultaneous cultivation of several species on one plot, reduces chemical inputs, improves soil fertility and promotes biodiversity (Glaze-Corcoran et al., 2020; Maitra et al., 2021), yet the motivations and barriers behind its adoption remain poorly understood (Kangogo et al., 2021). Work on the determinants of sustainable practice adoption underlines the weight of subjective perception (Ha et al., 2023), but no comparative study has examined this dimension across Mediterranean countries, where intercropping in arboreal systems could be particularly valuable.

Purpose, Aim and Objectives

The study maps divergent viewpoints on intercropping adoption among farmers, technicians and researchers in five Mediterranean countries, identifying contrasting patterns of perception across roles and national contexts.

Methodology and Methods

Q methodology combines by-person factor analysis with qualitative interpretation to map shared patterns of thought within a population of communicants. Statements were sampled from the concourse, the universe of opinion on the topic, through 10 semi-structured interviews and 12 written surveys with key informants. From these a Q-set of 32 statements was selected, four per thematic dimension (environmental, economic, social, agronomic), crossed with the two Technology Acceptance Model constructs, perceived usefulness and perceived ease of use (Davis, 1989). A purposive stratified P-set targeted 21 respondents per country (7 farmers, 7 researchers, 7 consultant agronomists) across Italy, Croatia, Portugal, Morocco and Israel; after five non-responses, 100 of the 105 invited returned valid Q-sorts. Statements were rank-ordered on a quasi-normal forced-choice distribution from −4 to +4, analysed by centroid extraction with varimax rotation (Figure 1).

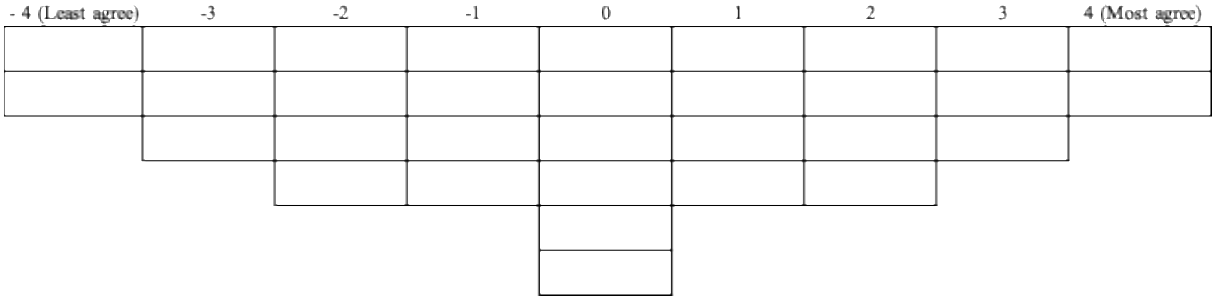


Figure 1 Q-sorting

Findings and Contribution

The five-factor solution accounts for 49% of variance, drawing on the 64 Q-sorts loading significantly on one factor alone (Table 1). Factor 1 (Pragmatic Agro-Ecological Optimist) frames intercropping as ecologically harmonious and compatible with modern production. Factor 2 (Market-Oriented Agronomic Moderniser) prioritises secondary income and voluntary CAP eco-scheme integration. Factor 3 (Reluctant Dissident) pairs scepticism toward market rationales with a normative insistence on mandatory adoption. Factor 4 (Ecological Moderniser) foregrounds biodiversity, climate services and accessibility. Factor 5 (Ambivalent Sceptic) values intercropping for employment and cultural preservation while doubting its fit with contemporary farming. One consensus statement holds throughout: agroecological practice yields a dual economic and social benefit. Factor membership cuts across country and professional role alike.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Defining Q-sorts	12	23	5	20	4
Cumulative variance (%)	31	36	41	45	49

Farmers	3	8	2	7	2
Researchers	7	5	1	6	1
Technicians	2	10	2	7	1

Table 1: Summary of factor extraction and defining Q-sorts

Research Limitations

Q methodology generalises to the discursive space of the concourse, not to a population; the five countries reflect an existing project partnership rather than a sampling strategy for Mediterranean representativeness.

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FROM ADOPTION PROPENSITY TO SCEPTICISM: BEHAVIOURAL PROFILES OF ITALIAN WINEGROWERS TOWARD PRECISION AGRICULTURE TECHNOLOGIES

Biondo, Adriano[1]; Maria Crescimanno[1]; Emanuele Schimmenti[1]; Mirabella, Claudio[1], Galati, Antonino[1]

[1] Department of Agricultural, Food and Forest Sciences, University of Palermo, Palermo, Italy

Keywords: precision viticulture; willingness to pay; technology acceptance; cluster analysis

Introduction

Growing environmental constraints, climate uncertainty, and the need for greater resource-use efficiency have increased interest in precision agriculture technologies (PATs) to improve farm resilience and reduce environmental impacts (Trendov et al., 2019). PATs are particularly relevant in viticulture, a sector with intensive fertilizer and pesticide use; notably, around 70% of fungicide use in the EU is attributable to viticulture (Eisenmann et al., 2023). Although site-specific management improves efficiency, yields, and grape quality, PAT adoption remains uneven. Research has mainly focused on technical and economic aspects, with limited attention to the beliefs and perceptions influencing winegrowers' adoption decisions (Sofia et al., 2025; Groher et al., 2020; González-Vivar et al., 2025). Previous studies show that PAT adoption is influenced by perceived usefulness, risk perceptions, and social norms, yet persistent heterogeneity in adoption highlights the need for more targeted policy and extension strategies (Tur Cardona et al., 2025). Against this background, this study aims to identify distinct belief-based profiles of Italian winegrowers regarding PATs and to characterise these groups according to familiarity with PATs, consortium-based access, willingness to pay, and socio-demographic and wineries characteristics using a cluster analysis approach.

Methodology and Methods

To address the research objectives, a two-step cluster analysis was performed on data obtained from a survey involving 272 Italian winegrowers. Clustering was based on seven standardized belief-related constructs: perceived usefulness (PU), perceived ease of use (PEOU), subjective norm (SN), risk perception (RISKPER), risk tolerance (RISKTOL), result demonstrability (RD) and image (IMG). A combined hierarchical and k-means cluster analysis was used to group respondents with similar attitudes and behaviors. Ward's method and squared Euclidean distance were applied, and ANOVA tested differences among clusters.

Findings and Contribution

Cluster analysis identified three segments of winegrowers. The first cluster, "Precision-oriented winegrowers," includes winegrowers with a strong propensity to adopt PATs, characterized by high levels of PU, PEOU, social norms SN, RD, and IMG, together with the highest WTP. Notably, 68.8% are willing to pay for at least one technology. "Pragmatic winegrowers" (Cluster 2) likewise demonstrate a favourable orientation toward PATs. However, their adoption stance appears more pragmatic and less socially motivated, as evidenced by lower SN and IMG effect relative to Cluster 1. "Risk-sensitive sceptics winegrowers" (Cluster 3) represents the most sceptical group, characterised by higher risk perception and the lowest WTP (30.9%). Clusters differ significantly in age, whereas no statistically significant differences emerge in education level or farm size. ANOVA confirmed significant between-cluster differences for all clustering variables (Table 1).

	Cluster		Error		F	Sig.
	Mean square between groups	df	Mean square within groups	df		
PU	101.322	2	0.790	269	128.22	0.000
PEOU	95.282	2	1.001	269	95.21	0.000
SN	91.050	2	1.339	269	68.01	0.000
RISKPER	40.431	2	0.873	269	46.29	0.000
RISKTOL	14.185	2	1.263	269	11.23	0.000
RD	117.997	2	1.548	269	76.21	0.000
IMG	114.685	2	1.359	269	84.41	0.000

Table 1 - Analysis of variance (ANOVA) among and within clusters.

Conclusions

The results identify distinct clusters of winegrowers differing in age, familiarity with PATs, willingness to pay, and interest in consortium-based access. Older, less familiar winegrowers require targeted awareness and trust-building initiatives, while the other clusters appear more receptive to market- and consortium-based models. These findings should be interpreted considering the study's cross-sectional design, self-reported data, and non-probabilistic sample.

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OF BLUE CRABS AND PINK OYSTERS: NARRATIVE REFRAMING AND GOVERNANCE CO-EVOLUTION AS DRIVERS OF SUSTAINABLE BUSINESS MODEL INNOVATION

Finotto, Vladi; Mauracher, Christine

Venice School of Management, Ca' Foscari University of Venice, Venice, Italy

Keywords: Sustainable business model innovation; Place-based business models; Strategic renewal; Agrifood transitions; Narrative reframing; Multi-stakeholder governance

Introduction

Regions whose economy is specialized in fishing and aquaculture face a structural challenge: how to initiate inclusive and durable transitions when small-scale firms and coastal communities operate under resource scarcity, carry identities tied to practices that are no longer ecologically or economically viable. A central but under-explored question for business and management scholarship is how marginal agrifood systems can redesign their business model along economic, environmental and territorial dimensions — that is, how a sustainable, place-based business model can emerge from crisis and become a vehicle for inclusive renewal and competitive resilience in challenging times.

We focus on firms located in the Sacca di Scardovari, a lagoon in the UNESCO Biosphere Reserve of the Po Delta (Veneto, Italy), where the invasive blue crab and climate change compromised the shellfish economy between 2021 and 2023, reducing the number of active fishers from roughly 1,500 to 980. The shock deepened territorial marginalisation but opened a window of opportunity for oyster aquaculture. Within three years, new firms entered the sector, incumbent institutions reconfigured, and a distinctive territorial product — the "Ostrica Rosa del Delta" — crystallized around a sustainable, place-based business model integrating premium food production, ecosystem services and slow tourism.

We argue that crisis-induced strategic renewal in marginal agrifood systems is made possible by the emergence of new firms whose business model is structured around two interrelated

processes. The first is a narrative reframing process through which new practices acquire cultural legitimacy and the meanings attributed to local products and professions are reconfigured: in our case the oyster shifted from non-native species to premium territorial product, carrier of cultural heritage and quantifiable provider of ecosystem services (water filtration, carbon capture). This enabled the simultaneous redesign of the three layers of the business model – economic, environmental and social and territorial. The second is a governance process: the co-construction of institutional arrangements able to sustain scale-up, regulate access to lagoon resources and coordinate competing interests between incumbents and new actors. Such a process requires close collaboration between firms and local institutions, in an attempt to foster the consolidation of a multi-stakeholder ecosystem. These two dimensions co-evolve: without new narratives, governance lacks legitimacy to mobilize stakeholders; without governance, the new business model concentrates benefits among pioneer firms and excludes the wider community.

The paper makes two contributions to business and management research. First, it develops an empirically grounded framework of crisis-induced sustainable business model innovation in marginal agrifood systems, where economic, environmental and territorial value are co-produced through the parallel reconfiguration of narratives and governance. Second, it identifies managerial and institutional mechanisms that enable inclusive scaling of place-based business models: cultural recognition schemes, collective territorial branding, institutional intermediaries bridging firm-level innovation and stakeholders, and funding architectures that transform pioneering business models into replicable templates for other marginal areas exposed to similar shocks.

Methods

The research combines semi-structured interviews with firm founders, institutional actors and local food operators, and analysis of policy documents, EU project materials, media coverage and market data. The analytical framework draws on the literature on sustainable place-based business models, value proposition redesign in agrifood firms, and stakeholder-driven governance of sustainability transitions. Respondents were selected among entrepreneurs (two oyster farmers, one restaurant owner), institutional representatives (three representatives from local promotion organizations), intermediary organizations (one respondent from the local consortium), managers of cooperative firms (four), until we reached theoretical saturation.

Interviews were transcribed and thematically analyzed together with texts from secondary sources.

Empirical findings

The 2015 UNESCO Biosphere Reserve designation acted as a critical resource for narrative transformation, offering a frame for place-based storytelling. Chef networks, national media and EU project funding accelerated the revaluation of the product and built the cultural infrastructure for new firm entry. At the governance level, the transition required reconfiguring pre-existing institutions: the fishers' consortium extended its mandate from shellfish concessions to oyster aquaculture, providing legal access to the lagoon and collective representation; the Delta Park emerged as a strategic intermediary mobilizing EU funding, with regional authorities contributing co-financing. This multilevel configuration allowed the new business model to scale beyond pioneer firms and constitute a genuine place-based food system.

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SERVICE QUALITY PERCEPTIONS AT TOURIST DESTINATION AIRPORTS: ASPECT-BASED SENTIMENT ANALYSIS OF USER-GENERATED CONTENT AT GREEK ISLAND AIRPORTS

Korfiatis, Antonis[1]; Argyropoulou, Maria[1]
[1]Department of Tourism, Ionian University, Corfu, Greece

Keywords: airport service quality, aspect-based sentiment analysis, user-generated content, VADER.

Introduction

Airport service quality is a critical determinant of tourist satisfaction, representing an important experiential and service interaction point. Greece, welcoming approximately 32 million international tourists in 2023 and ranking fourth among EU destinations (SETE, 2024), relies on a geographically dispersed network of island airports to manage inbound leisure demand. Yet conventional measurement approaches—the SERVQUAL framework and the Airports Council International (ACI) Airport Service Quality (ASQ) programme—are resource-intensive, temporally limited, and difficult to scale. The proliferation of user-generated content (UGC) on platforms such as Google Maps, combined with advances in natural language processing, opens opportunities for scalable quality evaluation.

Purpose, Aim and Objectives

This study aims to evaluate service quality perceptions at Greek tourist destination airports through large-scale aspect-based sentiment analysis (ABSA) of UGC. Four research questions are addressed: (1) Which service aspects do tourists most frequently discuss? (2) How does overall sentiment vary across airports? (3) Which dimensions drive satisfaction and dissatisfaction? (4) What dominant topics emerge from topic modelling and how do they relate to airport-level performance?

Literature Review and Theoretical Framework

Airport service quality research is grounded in the SERVQUAL framework (Parasuraman et al., 1988) and the ACI ASQ programme (Airports Council International, 2022), which

identify cleanliness, staff behaviour, queuing efficiency, facilities, and physical infrastructure as core quality dimensions. Tourist destination airports represent a distinct typology (Graham, 2014): they serve predominantly leisure travellers under significant capacity constraints. The adoption of UGC platforms has created an alternative to survey data (Xiang and Gretzel, 2010), and advances in NLP—particularly the VADER lexicon-based sentiment analyser (Hutto and Gilbert, 2014) and Latent Dirichlet Allocation (LDA) topic modelling (Blei et al., 2003)—have made large-scale textual analysis feasible.

Methodology

A corpus of 118,943 Google Maps reviews for 15 Greek airports (2013–February 2025) was collected, of which 42,730 contained substantive textual content. ABSA was conducted across six dimensions derived from SERVQUAL and ACI ASQ: cleanliness, staff behaviour, queuing and waiting times, facilities, physical infrastructure, and operational organisation. LDA topic modelling with eight components was applied to identify recurring narrative patterns.

Findings and Contribution

Findings reveal pronounced heterogeneity across airports. Small island airports—Kefalonia (mean VADER compound = 0.200) and Lesvos (0.193)— outperform high-traffic destinations, with Mykonos (−0.006), Santorini (−0.013), and Kos (−0.055) recording negative mean sentiment consistent with overtourism-driven service degradation. Queuing and waiting times constitute the most frequently discussed aspect (22,951 mentions) and the most universally negative dimension. Staff behaviour remains consistently positive even at poorly rated airports, suggesting frontline personnel maintain quality under operational stress.

Originality and Value

This study provides quantified evidence that overtourism pressures at premium island destinations manifest directly in negative online sentiment, with immediate implications for airport capacity policy and demand management. Methodologically, the study demonstrates that UGC-based ABSA constitutes a scalable, cost-effective complement to conventional survey instruments.

Research Limitations

The study is restricted to English-language reviews, potentially excluding non-Anglophone tourist segments. VADER is a general-purpose lexicon not domain-adapted to the aviation context, and reviews represent a self-selected population of motivated contributors, which may skew sentiment distributions toward extreme experiences.

Theoretical and Practical Applications-Implications

The findings support demand-management interventions, including slot controls and seasonal airport charges, at chronically overcrowded island airports. The strong performance of small regional airports offers a model for scalable quality improvement independent of facility size. For airport operators and tourism policymakers, UGC-based monitoring provides continuous, granular quality intelligence at minimal cost.

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PURPOSE-DRIVEN ENTREPRENEURSHIP IN RURAL TOURISM: COMMUNITY EMBEDDEDNESS AND INNOVATION IN LOW-DENSITY TERRITORIES

Ana Martins [1], Mafalda Patuleia [2,4] and Álvaro Dias [3,4,*]

1. Tourism Departament, Lusófona University, Campo Grande, Lisbon, Portugal.

2. CETRAD, Intrepid Lab, Porto, Portugal.

3. BRU-ISCTE-Instituto Universitário de Lisboa, Av. das Forças Armadas, 1649-026 Lisbon, Portugal.

4. César Ritz Colleges, Brig Campus, Englisch-Gruss-Strasse 43, 3902 Brig-Glis, Switzerland.

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Keywords: lifestyle entrepreneurship; rural tourism; community embeddedness; social innovation; territorial sustainability; place identity

Lifestyle entrepreneurship (LE) has become increasingly relevant in rural tourism, especially in low-density territories where conventional economic models struggle with depopulation, ageing, limited employment, and weak diversification. Unlike conventional profit-oriented entrepreneurs, these actors prioritise personal fulfilment, autonomy, quality of life, authenticity, and emotional connection to place, while creating value for local communities (Cunha et al., 2020). This study examines purpose-driven entrepreneurship in rural tourism as a socially embedded process through which personal values, community relations, and local resources are transformed into innovative tourism practices.

Although LE has received growing academic attention, important gaps remain. Existing studies often emphasise individual motivations, while giving less attention to community embeddedness, and community engagement is frequently discussed in broad terms, without clear operationalisation or indicators. Moreover, innovation in rural lifestyle entrepreneurship is often described descriptively, rather than connected to innovation frameworks. Addressing these gaps, this study investigates how LE in low-density

territories combine lifestyle aspirations, community embeddedness, and place identity to generate socially meaningful and territorially grounded innovation.

The research aims to: (1) analyse motivations driving LE in rural tourism; (2) explore how innovation emerges from entrepreneurial values, local knowledge, and territorial embeddedness. A qualitative multiple case study design was adopted, focusing on three tourism ventures in the Planalto Mirandês region of Portugal, a low-density territory with strong cultural and environmental assets but structural vulnerabilities. Data were collected through semi-structured interviews, document analysis, and field observations, and analysed through thematic analysis following Braun and Clarke's procedures (Braun & Clarke, 2006). The limited number of cases enables analytical depth rather than statistical generalisation; therefore, findings are exploratory and require future quantitative validation across broader and more diverse rural settings.

Findings show that LE is mainly driven by intrinsic motivations, including passion, personal fulfilment, autonomy, search for meaning, and emotional attachment to place. These motivations reflect the interaction between dissatisfaction with conventional work patterns and the attractiveness of rural territories (Cunha et al., 2020). Community engagement emerged as a central dimension of entrepreneurial practice. Drawing on Bowen et al. (2010), the study distinguishes between transactional engagement, based on occasional exchanges with local actors; transitional engagement, involving regular cooperation and mutual support; and transformational engagement, characterised by co-creation, shared decision-making, and visible community benefits.

Innovation appears as context-dependent and embedded in local resources rather than primarily technological or growth-oriented. The cases suggest that rural lifestyle entrepreneurs innovate by reinterpreting traditions, preserving vernacular architecture, creating educational and experiential tourism products, mobilising local narratives, and designing business models aligned with sustainability. These practices can be understood through complementary innovation frameworks: social innovation (community empowerment and cohesion); cultural innovation (reinterpretation and identity); product and experience innovation; and business model innovation (Dias & Silva, 2021).

The contribution includes an integrated view of LE in rural tourism as a purpose-driven, community-embedded, and territorially situated phenomenon. Its academic contribution lies in clarifying the relationship between motivations, transformational engagement,

innovation, and territorial sustainability. From a policy perspective, findings suggest actionable support mechanisms, including simplified administrative procedures, micro-funding, collaborative governance training, local partnerships, and destination policies that recognise LE as agent of rural regeneration.

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EXPLORING THE ROLE OF SERVICESCAPE IN SHAPING EMPLOYEE EXPERIENCE IN HOSPITALITY SETTINGS

Papadopoulou, Georgia[1]; Argyropoulou, Maria[2]; Siomkos, George[1]
[1]Department of Business Administration, Athens University of Economics and Business, Athens, Greece
[2]Department of Tourism, Ionian University, Corfu, Greece

Keywords: servicescape, employee experience, hospitality industry, environmental psychology, Greece.

Introduction

Hotels operate within physical environments that shape employees' daily work practices, perceptions, and emotional states. Despite growing interest in Employee Experience (EX), limited empirical research has examined how the servicescape (Bitner, 1992) contributes to employees' holistic experience at work, particularly in hospitality settings. This gap is especially significant given workforce challenges faced by the hospitality sector, including staffing shortages, seasonality, and increased operational pressure. By focusing exclusively on employees and conceptualising EX as a composite construct, the study contributes to employee-centric servicescape research and provides context-sensitive insights for hospitality management.

Purpose, Aim and Objectives

The study aims to examine the role of servicescape in shaping Employee Experience in hospitality settings. The objectives are: (1) to conceptualise the servicescape as a multidimensional internal work environment; (2) to empirically assess the relationship between servicescape dimensions and Employee Experience; and (3) to derive context-sensitive implications for hospitality management under conditions of operational pressure.

Literature Review and Theoretical Framework

Building on servicescape and Employee Experience literature, this study proposes that the physical and atmospheric characteristics of hotel environments positively influence employees'

overall experience at work (Bitner, 1992; Wakefield and Blodgett, 1996; Maylett and Wride, 2017). The main hypothesis posits that servicescape dimensions are positively related to Employee Experience (H1), with sub-hypotheses proposing positive relationships with employee satisfaction (H1a), engagement (H1b), and discretionary effort (H1c).

The model is grounded in Social Exchange Theory (Blau, 1964), which posits that benefits provided by one party create an obligation to reciprocate. This reciprocal logic is reflected in the psychological contract, encompassing employees' beliefs regarding organisational promises, obligations, and expectations (Conway and Briner, 2005).

Methodology and Methods

The study draws on a structured employee survey conducted between May and July 2025 in four- and five-star hotels across Greece. Servicescape perceptions followed Kaminakis et al. (2019). Employee Experience was modelled as a second-order construct comprising satisfaction, engagement, and discretionary effort, measured using validated scales. Path analysis was employed to test the hypothesised relationships.

Main Findings and Contribution

Partial support was found for the main hypothesis. Ambiance and cleanliness exert statistically significant positive effects on Employee Experience, while functionality shows a positive but marginally non-significant relationship. Additional analyses reveal demographic and organisational differences, with higher evaluations reported by female and older employees and in higher-rated hotels. The study advances employee-centric servicescape research by demonstrating that not all environmental attributes exert equivalent influence on Employee Experience.

Originality and Value

By distinguishing between servicescape dimensions that actively support positive experiential evaluations and those that primarily establish acceptable working conditions, the findings offer a refined theoretical understanding of how workplace environments shape employees' experience in hospitality settings.

Research Limitations

The focus on four- and five-star hotels in Greece limits generalisability to other accommodation types. The cross-sectional design captures relationships at a single point in time; consequently, causal inferences cannot be firmly established, nor can changes in Employee Experience over time be observed.

Theoretical and Practical Applications and Implications

The results align with the stimulus–organism–response framework, which posits that environmental stimuli shape affective and cognitive responses that subsequently influence behavioural outcomes. The findings underscore the importance of a context-sensitive approach to servicescape management, with practical implications for hotel operators seeking to improve employee retention and wellbeing.

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COVERT RESEARCH FOR SENSITIVE STUDIES: AN ETHNOGRAPHIC ACCOUNT

Leonidas Efthymiou[1], Andrew Michael[2], Epaminondas Epaminonda[1], Yianna Orphanidou[1], Alexander Pakhalov[1]

[1] University of Nicosia, Nicosia, Cyprus

[2] Department of Management and Marketing, American University of Cyprus, Larnaca, Cyprus

Keywords: Ethnography, Covert Research, Luxury Hotel, Methodology

Introduction

This study examines the ethical and methodological challenges of researching workplace resistance in a luxury hotel through ethnography. It focuses on a four-month study that began with covert participant observation and later moved towards gradual disclosure and overt research. The issue is important because formal ethical procedures rightly prioritise informed consent and transparency, yet fully overt access may alter behaviour or prevent the observation of concealed, risky, and sensitive practices.

Purpose, Aim and Objectives

The purpose of this study is to assess whether an initial covert phase of participant observation can be methodologically necessary and ethically defensible when researching workplace resistance. The aim is to examine how gradual disclosure affects trust, access, consent, confidentiality, and data quality. Its objectives are to: examine the rationale and ethical implications of covert entry; and consider the contribution of a context-sensitive approach to research ethics.

Literature Review and Theoretical Framework

The study draws on literature concerning workplace resistance, labour process theory, and ethnography. Sensitive research involves topics that may expose participants to risk through the collection or disclosure of information (Lee, 1993). Workplace resistance is sensitive because employees may face stigma, disciplinary action, greater managerial surveillance, or dismissal if their conduct is revealed.

Labour process theory highlights the continuing tension between managerial control and worker agency. Resistance may include humour, cynicism, withdrawal, working to rule, informal dissent, knowledge concealment, or minor acts of non-compliance. However, such behaviour can be difficult to distinguish from boredom, play, or routine dissatisfaction (Ackroyd and Thompson, 1999). Ethnographic immersion is therefore useful because it enables conduct to be interpreted within its organisational and relational context.

Goffman's distinction between frontstage and backstage behaviour also informs the analysis. Hotel employees may perform carefully managed identities in guest-facing settings while expressing critique, frustration, and solidarity in staff-only areas. These backstage interactions are particularly relevant to understanding concealed forms of resistance.

Methodology and Methods

The study used ethnography, specifically participant observation. The researcher entered a luxury hotel as an employee and worked alongside staff. This insider position enabled observation of routines, interactions, conflicts, informal conversations, and unguarded workplace practices.

Data collection involved observation, informal discussions, opportunistic and arranged interviews, and social interaction with workers outside the hotel. Field notes were initially recorded discreetly and later expanded into a detailed observational diary. To reduce potential harm, names were coded, identifying details were removed, and sensitive data were securely managed.

Findings and Contribution

The findings suggest that the initial covert phase enabled access to subtle and routine forms of resistance that may have been unavailable through fully overt research. These included informal complaints, humour, negotiated compliance, concealed actions, and everyday expressions of dissatisfaction. Participants appeared more willing to discuss sensitive experiences after the researcher had worked alongside them and was no longer perceived as an outsider or potential management representative.

Originality and Value

The study offers a reflexive insider account of research that moved from limited concealment to overt engagement in a luxury-hospitality workplace. It shows how ethical dilemmas emerge in practice and argues that ethical evaluation should consider necessity, proportionality, confidentiality, participant protection, and potential harm alongside formal consent procedures.

Research Limitations

The study concerns one luxury hotel and does not seek statistical generalisability. The researcher's dual role as employee and ethnographer may have influenced relationships and interpretation. The absence of full initial informed consent remains an important ethical limitation, while some observed practices may be open to alternative interpretations.

Theoretical and Practical Applications and Implications

The study supports labour process research by demonstrating that resistance among emotional and aesthetic labourers can be concealed within ordinary workplace interactions. For researchers and ethics committees, it highlights the need for careful, case-specific assessment of sensitive studies where full prior disclosure may compromise research access or increase risks for participants.

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MORE THAN JUST EFFORT: COGNITIVE PATHWAYS TO THE IKEA EFFECT

Lamprinakos, Grigorios[1]; Halkias, Georgios[2]; Christofi, Michael[3]

1 Department of Marketing, University of Birmingham, Birmingham, UK
2 Department of Marketing, Copenhagen Business School, Copenhagen, Denmark
3 Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania

Keywords: IKEA effect, consumer effort, cognitive responses, online reviews, Elaboration Likelihood Model (ELM)

Prior research on the IKEA effect shows that self-invested effort often enhances product valuation, attitudes, and downstream behavioral intentions, yet it remains less clear when effort backfires and through which cognitive mechanism this occurs (Atakan et al., 2014; Fuchs et al., 2010; Norton et al., 2012; Pelled et al., 2026; Sarstedt et al., 2017). Drawing on the Elaboration Likelihood Model (Petty and Cacioppo, 1986), we address this gap by proposing that effort does not uniformly increase evaluations; rather, it amplifies the evaluative consequences of consumers' self-generated thoughts.

Across four experiments - one in-class study, one field experiment, and two online experiments with Prolific participants, three of which were pre-registered - we use a 2 x 2 factorial design to examine how effort and cognitive response valence jointly shape attitudinal and behavioral outcomes. Studies 1 and 2 establish the core pattern by contrasting favorable versus unfavorable cognitive responses under high- versus low-effort conditions across classroom and field settings. Studies 3 and 4 then isolate the negative pathway more precisely by contrasting negative versus neutral cognitive responses in pre-registered online experiments.

The findings both replicate and reverse the well-established IKEA effect. When consumers generate favorable cognitive responses, high effort enhances attitudinal and behavioral outcomes. However, when unfavorable cognitive responses emerge, high effort amplifies their negative evaluative consequences, producing more unfavorable attitudinal and behavioral outcomes. Further, in the two pre-registered online experiments, high effort intensifies the detrimental effects of negative relative to neutral cognitive responses, whereas under low-effort conditions these differences are attenuated.

These findings extend the IKEA effect beyond the dominant view that effort generally increases valuation by identifying a new mechanism: effort polarizes evaluations by amplifying the impact of consumers' self-generated thoughts. Managerially, the results suggest that self-assembly and co-creation strategies are most effective when firms first ensure favorable cognitive inputs - such as positive product information, supportive review

environments, and clear assembly cues - because effort can otherwise magnify dissatisfaction and reduce favorable behavioral responses.

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DESIGNING AND DIFFUSING VIRTUAL BRAND RITUALS: A MIXED-METHODS INVESTIGATION OF DIGITAL CONSUMER PRACTICES

Dinana, Hesham[1] El Tazy, Ghada[2]

[1]School of Global Affairs and Public Policy, The American University in Cairo, Cairo, Egypt

[2]School of Business Administration, Ahram Canadian University, Giza, Egypt

Keywords: Virtual Brand Rituals, Digital Consumer Behavior, Ritual Adoption, Brand Experience Design, Social Contagion, Digital Transformation, Mixed-Methods, Consumer Ritual Theory

Introduction

Rituals transform ordinary consumption into meaningful experiences through prescribed behaviors, artifacts, and symbolic actions. In consumer research, brand rituals have been shown to deepen customer relationships and elevate mundane practices into sacred moments. While physical brand rituals are well documented, digital environments introduce new challenges and opportunities for translating ritual engagement into virtual contexts. This study examines how brands design and diffuse virtual rituals to enhance consumer experiences and strengthen brand relationships in digital environments.

Purpose, Aim, and Objectives

The study addresses two central research questions:

1. How can traditional principles of ritual design be effectively adapted for virtual brand experiences?
2. What mechanisms facilitate consumer learning and adoption of virtual brand rituals?

The aim is to develop a theoretical framework for virtual ritual design and adoption that bridges consumer ritual theory with digital affordance and contagion models.

Literature Review and Theoretical Framework

Consumer ritual theory (Rook, 1985; Belk et al., 1989) highlights artifacts, scripts, roles, and audiences as key dimensions of ritualized consumption. Digital transformation challenges these

assumptions. Virtual artifacts acquire meaning through personalization, visibility, and archival value (Belk, 2013). Digital affordance theory (Leonardi & Vaast, 2017) identifies immediacy, replicability, persistence, and visibility as crucial enablers of ritual performance in virtual spaces. Brand experience design frameworks (Brakus et al., 2009; Schmitt et al., 2015) emphasize sensory, affective, intellectual, behavioural, and relational dimensions. These dimensions must be reinterpreted in digital contexts. Psychological mechanisms such as anxiety reduction, heightened attention, and anticipation (Hobson et al., 2018) remain central but require digital analogues. Finally, social contagion theory (Centola, 2018) explains how rituals diffuse through repeated exposure and social reinforcement in digital networks.

Methodology and Methods

A sequential mixed-methods design was employed:

- **Phase 1:** content analysis of 30 virtual brand rituals using the Virtual Brand Ritual Framework (VBRF) to identify design and engagement patterns.
- **Phase 2:** Industry informants' interviews exploring ritual design strategies.
- **Phase 3:** Consumers' interviews triangulating the framework through participants' ritual experiences and diffusion behaviors.

Main Findings and Contribution

Preliminary findings indicate that effective virtual rituals combine familiar ritual elements with digital affordances, including personalization, visibility, and community validation. The study introduces the Virtual Brand Ritual Framework (VBRF). It explains how ritual design and platform affordances shape experiential, psychological, and engagement outcomes. The framework also examines how rituals spread through virtual networks. Additionally, it provides practical guidance for marketers designing scalable digital ritual experiences.

Originality and Value

This research is among the first to systematically investigate virtual brand rituals. It bridges ritual theory with digital consumer behavior. The study also offers practical guidance for designing authentic, engaging, and scalable ritual experiences in digital environments.

Research Limitations

Limited industries and platforms that may reduce the study's generalizability.

Theoretical and Practical Applications and Implications

Theoretically, the study explains how digital artifacts become sacred and how rituals diffuse in virtual networks. Practically, offers a framework for designing virtual brand rituals that encourage emotional engagement and community participation.

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AI TOOLS FOR SMART SOCIAL MEDIA PLATFORM: A PRISMA LITERATURE REVIEW TOWARDS SUSTAINABLE DIGITAL MARKETING

Chedrawi Charbel[1]; Kazoun Nahil[2], Kokkinaki Angelika[3], and Zoghbi Bachir[4]

[1]Faculty of Business and Management, Saint Joseph University, Beirut, Lebanon.

[1]School of Business, University of Nicosia, Nicosia, Cyprus

[2]Faculty of Business and economics, Universite La Sagesse

[3]School of Business, University of Nicosia, Nicosia, Cyprus

[4]Faculty of Business and Management, Saint Joseph University, Beirut, Lebanon.

Keywords: Artificial Intelligence Adoption, Smart Social Media, Sustainable Digital Marketing, Sustainability, PRISMA Systematic Review, Technology Organization Environment Theory.

Abstract

Purpose – To explore how AI Tools can be used for Smart Social Media Platform Towards a more Sustainable Digital Marketing using A PRISMA Literature Review.

Design/methodology/approach – This research reviews PRISMA literature on how AI technologies promote smart social media platforms and sustainable digital marketing. Based on 67 peer-reviewed papers from 2020 to 2025, the review synthesizes digital marketing, social media, AI adoption, sustainability, and the Technology Organization Environment framework.

Findings – AI-driven predictive analytics, customization engines, and conversational interfaces improve marketing efficiency, customer engagement, and ESG alignment. The TOE paradigm also emphasizes technology capabilities, organizational preparation, and environmental pressures as AI adoption factors. Despite these benefits, ethical governance, data protection, and cultural adaption remain issues.

Originality/value – The study emphasizes the necessity for strong governance structures to integrate AI responsibly in marketing ecosystems.

Practical implications – This research bridges literature and practice to give marketers, policymakers, and academics concrete ideas for using AI for sustainable, inclusive, and ethical digital marketing.

Introduction

In today's hyper-connected digital landscape, social media (SM) platforms play a vital role in modern marketing strategies. They serve as essential tools for enhancing brand visibility, fostering customer engagement, and enabling data-informed decision-making (Shaheen, 2025). Despite their considerable potential, these platforms face enduring challenges that limit their long-term sustainability and overall effectiveness (Suprayitno, 2025). Many enterprises (SMEs) grapple with issues such as high marketing expenses, ineffective resource distribution, unclear marketing goals, and a lack of coherent content strategies that align with audience expectations (Sharabati et al., 2024). Additionally, many businesses invest heavily in digital tools without evaluating their outcomes or considering their alignment with broader environmental, social, and governance (ESG) objectives.

Kumar et al., (2025) claimed that classical marketing practices are often overly focused on short-term visibility metrics likes, shares, and impressions. This leads to inefficient, resource-intensive strategies that lack proper targeting and do not support ESG goals (Dwivedi et al., 2021). Moreover, a significant gap exists in integrating intelligent, sustainable marketing practices and Artificial Intelligence (AI) powered systems for building resilient and responsible SM ecosystems (Floridi & Cowls, 2019). In response to these challenges, smart AI tools provide transformative capabilities for building sustainable digital platforms.

Albeit the increasing interest in AI-driven SM marketing, current research shows a deficiency of contextual understanding of the influence of socio-economic and cultural aspects on AI adoption (Kumar et al., 2025). Ethical issues, including data privacy, algorithmic bias, and governance frameworks, remain inadequately examined, especially concerning sustainability goals (Li, 2025). Furthermore, the lack of interdisciplinary models connecting AI to SM, digital marketing, and sustainability underscores the necessity for more research related to this matter (Garg et al., 2025). Hence, come the following research questions:

- *What could be the challenges and difficulties faced within the classical SM and digital marketing strategies?*
- *What could be the factors affecting the adoption of AI tools for smart SM and sustainable digital marketing?*

Within this context, and through a PRISMA systematic literature review (SLR), this paper aim to study the existing literature between 2020 and 2025 about SM, digital marketing, and AI tools for digital marketing. This will help exploring the gaps and challenges that exist in the classical SM strategies and digital marketing and how the latest AI tools can fill these gaps and overcome the challenges while ensuring long-term sustainable strategies, based on the Technology-Organization-Environment (TOE) Framework that studies the factors that affect the adoption of AI tools in digital marketing.

The paper highlights the literature search methods and analysis based on the PRISMA SLR with inclusion and exclusion criteria along with the PRISMA flow diagram. This is followed by the literature found related to each key theme of our research: digital marketing, SM, AI and AI adoption, sustainability, and the TOE framework. The paper ends with a conclusion highlighting its implications, limitations, and research needed for the future.

Literature Search Method and Analysis

The PRISMA systematic literature review (SLR) method aims to improve the thoroughness, openness, and quality of systematic reviews (Page et al. 2021). The search formula employed is (“Digital Marketing” OR “Marketing Strategy”) AND (“Social Media Tools” OR “AI in Social Media”) AND (“AI Adoption”) AND (“Sustainability in Marketing”) AND (“Technology-Organization-Environment Framework”). We applied the following inclusion and exclusion criteria:

Aspect	Inclusion Criteria	Exclusion Criteria
Source	EBSCO and Scopus databases (Q3 journals and above)	Non-indexed or lower-ranked sources
Type	Peer-reviewed articles	Conference abstracts, theses, editorials, opinion pieces, grey literature
Year	Published from 2020 onwards	Published before 2020
Language	English	Non-English
Relevance	Focus on AI adoption, DEI, and sustainable societal practices	Not aligned with research objectives
Quality	Robust methodology and clear findings	Weak methodology or inconclusive findings

Table 1: Inclusion and exclusion criteria of the PRISMA approach.

Data extraction from the selected studies adhered to pre-established guidelines provided by PRISMA. The following data were mainly extracted from the selected articles: title, author, year, journal, research question and specific aims, conceptual framework, hypothesis, research methods or study type, and concluding points. Special attention was paid to the methodology to organize studies by study type category in the review results section. Furthermore, technical characteristics of the papers such as the type of the paper, the author(s), the year of publication, etc. were extracted. The use of PRISMA guidelines for data extraction has been demonstrated in various systematic reviews, such as the study by Liberati et al. (2009), which highlighted the importance of standardized data extraction to ensure consistency and reliability.

For the selection process, electronic databases including EBSCO - ALL and Scopus were used, focusing on journals ranked Q3 and above. The search covered research published between 2020 and 2025. This period was chosen to ensure the studies reflect current understanding of the subject. Some older publications were included when they provided essential historical perspective. The initial articles were screened using key inclusion criteria. For inclusion, articles had to be full-text publications in peer-reviewed journals. Book chapters, conference papers, extended abstracts, book reviews, and non-English publications were excluded. Duplicate and irrelevant articles that did not align with the research objectives were also removed.

The PRISMA flow diagram in appendix 1 illustrates the article selection process, from initial search results to final inclusion in the systematic literature review.

Results of the PRISMA Systematic Literature Review

The analysis of the PRISMA approach is structured around the principal themes that emerged from the evaluation process.

Digital Marketing

Over the past decade, digital marketing has evolved from simple online advertising to complex ecosystems that include SM, mobile platforms, and data analytics; this shift was part of the digital transformation of marketing which required organizations to adapt to stay competitive (Basimakopoulou et al., 2022). Wahyuni (2024) found that SM marketing, content marketing, and analytics dominate customer engagement. According to Pratama (2025), digital technologies and marketing processes interact, yet digital transformation studies lacked employee-centric

viewpoints. Digital marketing capabilities, especially when combined with digital tools, boosted business performance and customer engagement; these examples demonstrate the strategic importance of digital marketing for innovation and customer-centricity in dynamic company contexts.

Digital marketing has evolved into a multi-platform ecosystem that utilizes SM, interactive content, analytics, and omnichannel strategies to enhance customer engagement and deliver personalized experiences across multiple touchpoints (Dave & John, 2025; Kumar et al., 2025). However, organizations continued to face challenges such as data privacy concerns, skill shortages, infrastructural limitations, and resistance to technological change, which can hinder successful digital transformation (Pratama, 2025). Additional concerns included regulatory compliance, algorithmic transparency, and cybersecurity risks, particularly in highly competitive markets (Alkhalfan & Al Mubarak, 2025). Therefore, organizations must adopt strong governance mechanisms, invest in continuous upskilling, and implement adaptive strategies to ensure sustainable and ethical digital marketing practices (Patro, 2025).

Social Media

SM has transformed communication and marketing, becoming a key tool for brand engagement and customer interaction. Bartoloni and Ancillai (2023) found that SM marketing research has progressed from fragmented studies to integrated frameworks linking inputs, contextual factors, and outcomes. Similarly, Wirtz and Balzer (2023) described the evolution of SM marketing through four phases, emphasizing the importance of considering both consumer and managerial perspectives. Recent studies also highlighted challenges in evaluating SM effectiveness. Ascani and Ancillai (2025) argued that traditional metrics are insufficient for measuring interactive SM activities, while Rachmand and Dwita (2025) and Goyal (2024) demonstrated the importance of engagement-driven content and clear strategic objectives in achieving marketing success.

The emergence of "Smart SM" has further expanded the capabilities of these platforms through AI and advanced digital technologies. Liao et al. (2021) explained that AI-powered features such as sentiment analysis, misinformation detection, and inclusive design have transformed SM into influential socio-technical systems. Likewise, Żyminkowska and Zachurzok-Srebrny (2025) highlighted the role of AI in enabling real-time personalization, chatbots, and predictive analytics. Hasanuzzaman et al. (2025) and Leblanc and Roux (2024) further emphasized the growing

significance of AI tools in enhancing SM management and user engagement. Together, these studies suggest that organizations need strong strategic and measurement frameworks to maximize the benefits of increasingly intelligent SM platforms. The next section covers the AI for SM and digital marketing.

Artificial intelligence

Artificial Intelligence (AI) refers to the ability of machines to simulate human cognitive functions, including learning, reasoning, and problem-solving, enabling organizations to automate complex tasks and improve decision-making processes. Recent advancements have expanded AI applications across sectors such as healthcare, finance, marketing, autonomous systems, and natural language processing, making it a key driver of innovation and digital transformation (Savita et al., 2025).

In marketing, AI has become a strategic technology that enhances predictive analytics, customer relationship management, conversational commerce, and personalized consumer experiences (Jain & Kumar, 2024). AI-powered tools such as recommendation systems, chatbots, machine learning, and natural language processing have transformed how firms engage with customers, enabling real-time optimization, hyper-personalization, and improved campaign performance (Zhou & Jiang, 2025; Ziakis & Vlachopoulou, 2023). Frameworks such as the AI-Augmented Marketing Framework further highlight AI's role in personalized interaction, campaign automation, content creation, and ethical governance (Sundari et al., 2025). However, challenges related to organizational readiness, talent shortages, privacy concerns, and consumer trust continued to limit broader adoption (Masnita et al., 2024; Badawy et al., 2025; Spais & Chryssochoidis, 2025).

AI has also significantly enhanced SM marketing through predictive analytics, sentiment analysis, influencer analytics, content moderation, recommendation systems, and disinformation detection (Lyulyov et al., 2025; Leblanc & Roux, 2024). Studies showed that AI-driven personalization can improve consumer engagement, trust, satisfaction, and conversion rates, providing firms with a strong competitive advantage (Lyulyov et al., 2025). Nevertheless, concerns regarding algorithmic bias, data privacy, and ethical data use remained prominent, highlighting the need for transparent governance and responsible implementation to ensure sustainable and inclusive digital marketing transformation (Kumar el al., 2025).

Technology-Organization-Environment (TOE) Framework

The TOE framework is one of the most widely used models for explaining technology adoption and digital transformation (Tornatzky and Fisher, 2020). Recent studies confirmed its relevance in examining emerging technologies, organizational readiness, and external influences across different industries (Alsharif et al., 2023; Oliveira et al., 2022). Its flexibility and predictive power continued to make it a valuable framework for technology adoption research (Al-Qirim et al., 2024).

The TOE framework comprises three dimensions: technology, organization, and environment (Alsharif et al., 2023). Technology-related factors include compatibility, complexity, and perceived benefits, while organizational factors involve leadership support, resources, and culture (Al-Qirim et al., 2024). Environmental factors such as competition, regulations, and market uncertainty also play a significant role in shaping adoption decisions (Oliveira et al., 2022). Research further showed that organizations in highly regulated sectors are particularly influenced by environmental pressures when adopting new technologies (Alsharif et al., 2023). The figure below shows the TOE framework for AI tools adoption in digital marketing.

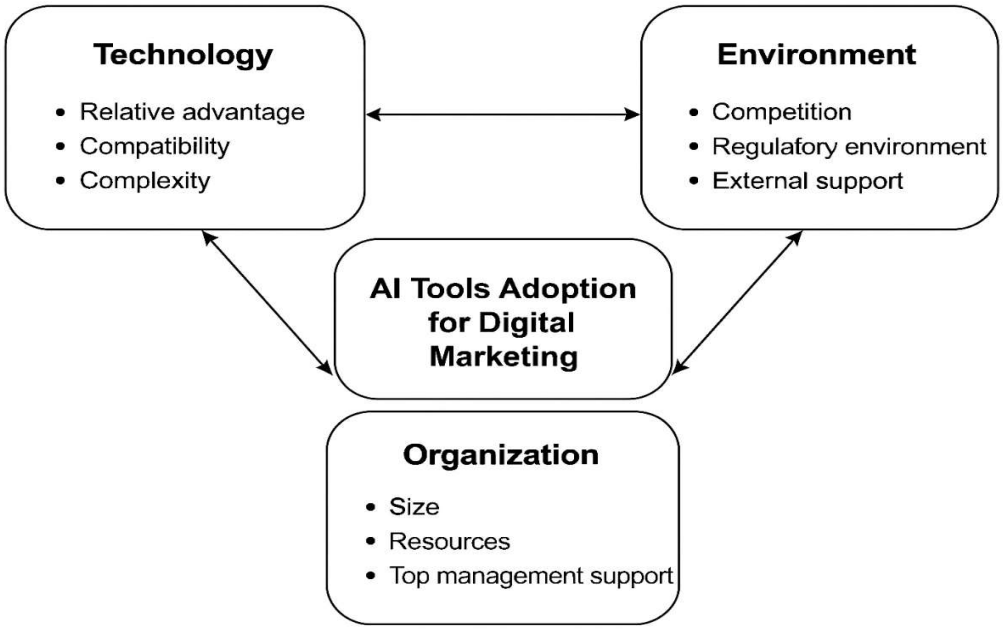


Figure 1: TOE framework for AI tools adoption in digital marketing (Tornatzky and Fleischer, 1990).

The TOE framework provides a useful lens for understanding AI adoption in digital marketing and smart SM. The technological dimension highlights AI capabilities such as personalization,

predictive analytics, and automation, while organizational factors such as leadership support, resources, and digital readiness influence successful implementation (Sundari et al., 2025; Ziakis & Vlachopoulou, 2023). Environmental factors, including competitive pressure and regulatory requirements, further drive AI adoption in SM and digital marketing platforms (Lyulyov et al., 2025). However, despite its strong predictive value, the TOE framework may not fully capture important issues such as ethical governance, transparency, customer trust, and sustainability, suggesting the need to extend the model beyond efficiency-focused adoption toward responsible AI innovation.

Sustainability

Sustainability is increasingly recognized as a strategic pillar in marketing, aiming to balance environmental, social, and economic goals while meeting present needs without compromising future generations. Recent studies showed that sustainable marketing extends beyond green product claims to include digital enablement, transparency, and responsible consumer engagement (Kumar et al., 2025). Technologies such as AI, IoT, blockchain, and digital platforms are further enhancing sustainable marketing practices and consumer experiences (Bindeebaa et al., 2025).

Despite growing interest, research highlighted several challenges in sustainable digital marketing. Studies reported inconsistencies in defining green initiatives, limited assessment of actual consumer behavior, and variations in methodological rigor (Gündüzyeli, 2025). While SM and AI support real-time engagement and marketing resilience, they also raise concerns related to privacy, bias, and ethical governance (Samuels, 2025).

Recent evidence suggested that AI can contribute to environmental, economic, and social sustainability through personalization, analytics, accessibility, and responsible consumption initiatives (Gündüzyeli, 2025). AI-supported transparency, eco-branding, and ethical data practices can strengthen consumer trust and sustainable decision-making (Li, 2025). However, effective implementation requires robust ethical oversight, process digitalization, and governance mechanisms to ensure long-term sustainability outcomes.

AI tools adoption for sustainable digital marketing practices

The PRISMA SLR showed that AI can be used for “social good” in marketing by reducing wasteful exposures, improving relevance, and improving societal/environmental outcomes if governance

balances personalization with fairness, transparency, and data minimization (Hermann, 2022). Organizations are increasingly adopting AI to demonstrate measurable environmental and social impacts, aligning marketing activities with ESG objectives, investor expectations, and responsible business practices (Lee et al., 2025). However, adoption alone is insufficient, as firms require appropriate governance, assessment mechanisms, and organizational maturity to achieve sustainable outcomes (Song & Majeed, 2023). AI-enabled personalization and natural language processing can further enhance consumer perceptions and loyalty toward sustainable brands, provided that ethical data practices and transparent AI models are maintained (Garg et al., 2025).

AI also contributes to sustainability by improving resource efficiency, emissions management, traceability, and campaign effectiveness through demand forecasting, recommendation systems, chatbots, and advanced analytics (Stallone et al., 2021). Studies emphasized that explainable AI, privacy-preserving analytics, and ethics-by-design approaches were essential for minimizing bias and ensuring responsible AI deployment (Kumar et al., 2025; Smith & Jones, 2023). Furthermore, digitalization, supply chain visibility, and AI-driven analytics can reduce waste and support ESG performance across the marketing value chain (Kumar et al., 2025). Collectively, these findings suggest that the sustainability benefits of AI depend not only on technological capabilities but also on strong governance, accountability, and ethical oversight. Table 2 below answers the research questions highlighted in the introduction.

Research Question	Synthesized Answers from PRISMA SLR
RQ1: Challenges & difficulties in classical SM/digital marketing	Over-reliance on short-term visibility metrics (likes, shares) with weak linkage to long-term value or ESG; fragmented omnichannel execution; skill shortages and organizational resistance; privacy and data-governance gaps; difficulty measuring SM performance with conventional metrics; resource waste from untargeted exposures and redundant impressions.
RQ2: Factors affecting AI-tool adoption for smart & sustainable digital marketing (TOE)	**Technology:** perceived benefits (personalization, predictive analytics, automation), compatibility with martech stack, complexity, need for explainability. **Organization:** leadership support, governance maturity, resources/talent, digital capabilities, risk culture. **Environment:** regulatory/compliance pressure, ESG scrutiny, competitive intensity, platform dynamics. These factors jointly determine responsible, scalable AI use in SM.

Table 2: Synthesized Research Questions Answers from PRISMA SLR

The PRISMA review highlighted that digital marketing has advanced rapidly through AI, SM, and sustainability initiatives. However, much of the existing research remains heavily conceptual, with

limited empirical validation. Furthermore, critical issues such as customer trust, employee perspectives, data privacy, algorithmic bias, and transparency remained underexplored despite their importance to long-term success. The findings also suggested that while AI-driven personalization and predictive analytics improve engagement and ROI, challenges related to organizational readiness, talent shortages, and regulatory compliance persisted. Although AI can support sustainability and ESG goals, weaknesses in governance, ethical oversight, and methodological rigor continued to limit its full potential, emphasizing the need for more inclusive and responsible digital marketing practices.

Conclusion

A PRISMA evaluation of 67 peer-reviewed research (2020-2025) revealed a coherent architecture linking AI technologies to engagement, efficiency, and ESG outcomes in SM. It identified recurring frictions (privacy, bias, skills gaps, measurement limitations) and showed how governance mechanisms and explainability mediated AI benefits (better targeting with lower resource waste), clarifying when AI produces sustainable value rather than incremental performance gains.

The PRISMA SLR and the TOE framework were used to examine the use of AI solutions for smart SM platforms and sustainable digital marketing. AI-driven solutions like personalization engines, predictive analytics, and conversational interfaces can improve classical marketing strategies, reduce resource waste, and align campaigns with ESG goals. Technological capabilities, organizational preparation, and environmental pressures are key adoption drivers of AI tools for smart SM and digital marketing.

Theoretical Implications

This study extended the TOE framework by integrating PRISMA-based evidence on AI-enabled SM and sustainable digital marketing. It expanded the technology dimension to include AI capabilities such as predictive analytics, personalization, and conversational tools; strengthened the organizational dimension through governance, ethics, and organizational readiness; and broadened the environmental dimension to encompass ESG pressures, data protection regulations, competition, and stakeholder expectations, providing a more comprehensive view of responsible AI adoption in marketing.

The findings highlighted that while the TOE framework remained relevant for analyzing digital marketing adoption, future theory must expand into socio-technical models that explicitly integrate ethics and sustainability, thereby aligning AI adoption, SM ecosystems, and sustainable marketing practices with contemporary debates on fairness, inclusivity, and responsible innovation.

Managerial Implications

The PRISMA SLR provides a practical guide for practitioners: (1) Establish leadership-anchored AI governance in marketing; (2) Prioritize modular capabilities (content generation, NLP sentiment, audience modeling) with explainability and data minimization; (3) Align KPIs with sustainability (frequency capping, deduplication, creative compression, accessibility) to reduce media and operational waste; and (4) Institutionalize cross-functional skills for responsible scaling across platforms. Firms can migrate from campaign-centric to system-centric SM operations, ensuring compliance, competitiveness, and ESG credibility.

Managers must reconcile the advantages of AI-driven digital marketing (predictive analytics, personalization, and omnichannel strategies) with challenges including skill deficiencies, organizational resistance, and regulatory compliance by integrating ethics-by-design, investing in workforce preparedness, and cultivating consumer trust to guarantee sustainable long-term value.

Limitations and Future Studies

This study relies on secondary data from published literature, which may not fully depict any socio-economic and cultural context. Focusing on 2020–2025 publications may have excluded new trends or unpublished industrial practices. The synthesis limits generalizability and does not empirically validate TOE framework linkages. For future research, the proposed model should be confirmed or enhanced qualitatively by conducting semi-structured interviews with key informants across the marketing and business domains to refine construct boundaries and surface context-specific mechanisms linking AI practices to sustainable outcomes in digital marketing. It can also be tested quantitatively estimating the effects of technology fit, organizational readiness, and environmental pressures on responsible AI adoption and on performance outcomes.

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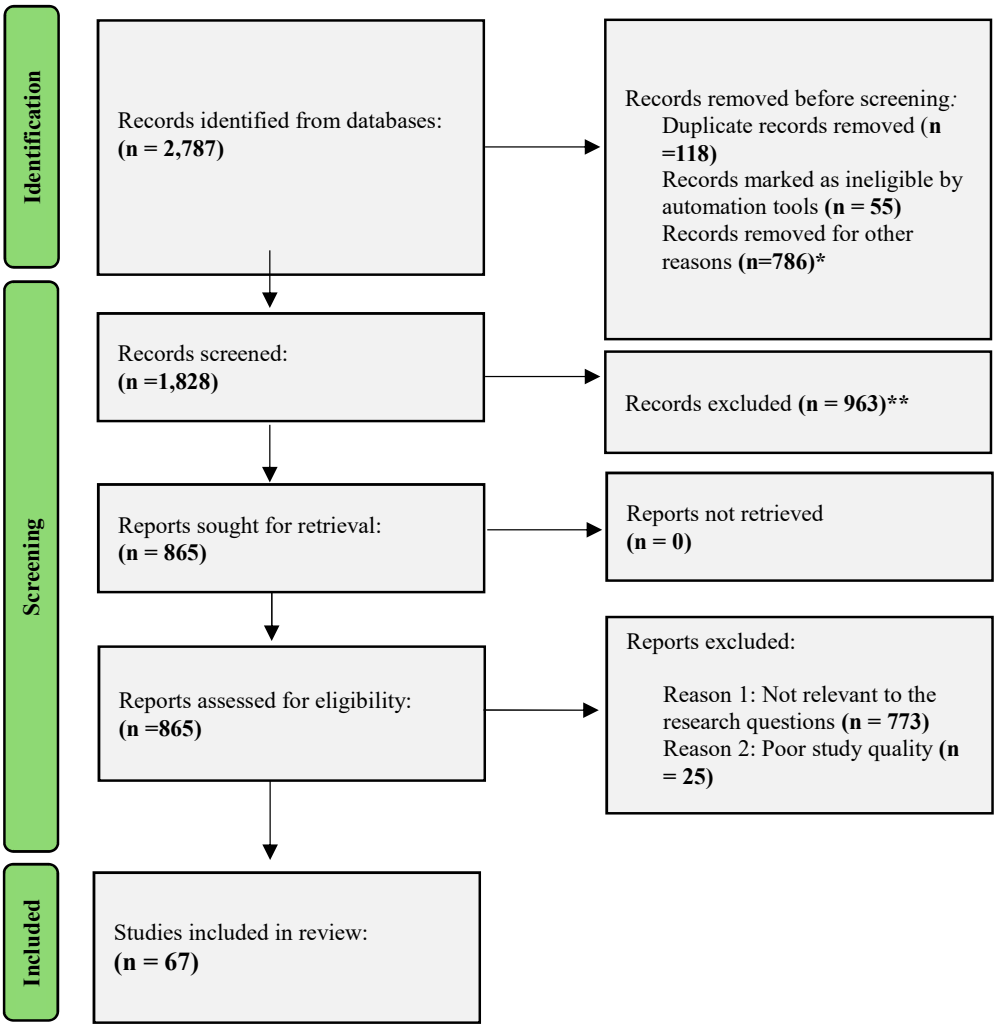
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Appendices

Appendix 1: PRISMA Flow Diagram



* Reasons of removing these articles include the language and peer-reviewed criteria, book chapters, conference papers, extended abstracts, book reviews, etc.

** This includes records excluded based on relevance to research objectives.

WORK STRESS AND IVF OUTCOMES

Turgeman-Lupo, Keren[1]; Bokek-Cohen, Ya'arit[2]; Miller, Netanella[3,4]; Haikin Herzberger, Einat[3,4]; Wiser, Amir[3,4]

[1]School of Management & Economics, The Academic College of Tel Aviv-Yaffo, Tel Aviv-Yaffo, Israel

[2]School of Behavioral Sciences, Netanya Academic College, Netanya, Israel

[3]Meir Medical Center, Kfar Saba, Israel

[4]Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

Keywords: Job Stress, Role Conflict, Emotional Exhaustion, Spillover Effect, Crossover Effect

Introduction

Research on psychological stress and in vitro fertilisation (IVF) success has produced mixed findings. Prior studies have mainly examined general emotional distress, with limited attention to contextual stressors embedded in everyday work and family life. Because work is a persistent source of stress for adults, occupational stressors offer an important management lens for understanding IVF outcomes.

Purpose, Aim and Objectives

This study investigates whether job-related stressors experienced by both partners are associated with IVF pregnancy outcomes. It examines whether women's role conflict and emotional exhaustion are associated with lower odds of clinical pregnancy, and whether partners' job emotional exhaustion moderates these associations. The study integrates spillover and crossover perspectives within the couple's work-family context.

Literature Review and Theoretical Framework

Meta-analytic evidence suggests no uniform direct association between pre-treatment emotional distress and assisted reproduction outcomes (Boivin, Griffiths and Venetis, 2011). Occupational stress research identifies role conflict and emotional exhaustion as key job stressors with adverse implications for employee functioning and well-being (Ganster and Rosen, 2013). Spillover theory proposes that strain originating in one domain may impair

functioning in another, whereas crossover theory suggests that strain may be transmitted between partners (Bakker and Demerouti, 2018; Cobb et al., 2024). Together, these frameworks suggest that women's work-related stress may spill over into fertility treatment, while partners' emotional exhaustion may condition this process.

Methodology and Methods

A cross-sectional prospective study was conducted among 44 heterosexual working couples (N = 88) undergoing IVF treatments in a hospital IVF unit. Both partners completed validated self-report questionnaires at the initial treatment stage. Clinical pregnancy outcome was obtained from medical records. Hierarchical logistic regression analyses were conducted, controlling for women's age, women's BMI, and optimism levels of both partners. Maximum-likelihood and robust Bayesian estimation methods were applied.

Findings and Contribution

Women's role conflict and emotional exhaustion were both significantly negatively associated with the likelihood of achieving pregnancy through IVF. Partners' emotional exhaustion moderated the association between women's role conflict and pregnancy outcomes. When partners reported relatively low emotional exhaustion, women's role conflict was not significantly related to pregnancy odds. At average and high levels of partners' emotional exhaustion, women's role conflict was associated with progressively lower odds of pregnancy. These findings show that IVF success may be shaped by patients' occupational stressors and partners' emotional exhaustion.

Originality and Value

This study is among the first to examine occupational stressors as potential predictors of IVF outcomes. Its dyadic perspective extends stress and fertility research beyond general psychological distress and highlights spillover-crossover processes as relevant to human resource management and organisational support.

Research Limitations

The study is limited by its relatively small sample and cross-sectional design, which restrict causal inference and generalisability. Future research should use larger samples and longitudinal designs across treatment stages.

Theoretical and Practical Applications and Implications

The findings extend spillover-crossover frameworks by showing that partners' emotional exhaustion can condition the association between women's role conflict and IVF outcomes. Practically, they point to the relevance of workplace policies and HR practices that reduce role conflict and emotional exhaustion among employees undergoing fertility treatments. Fertility-related well-being should therefore be viewed as a legitimate concern for organisational support, employee management and responsible workplace policy.

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EVALUATING LOGISTICS GRADUATES IN ISRAEL: MANAGERIAL EXPECTATIONS AND SKILL GAPS USING THE ANALYTIC HIERARCHY PROCESS

Levi-Bliech, Michal[1]; Rakus, Margaret[2]; Talmor, Irit[3]

[1]School of Management, Logistics Department, Western Galilee College, Acre, Israel

[2]Business Department, Gwynedd Mercy University, Gwynedd Valley, United States

[3]Research and Advising, Tel Aviv, Israel

Keywords: Logistics Education, Skill Gaps, Managerial Expectations, Analytic Hierarchy Process, Knowledge-Based View, Curriculum Design, Supply Chain Management

Introduction

Recent shifts in supply chain management, digitalisation, and artificial intelligence have necessitated a reassessment of whether undergraduate logistics curricula reflect current industry expectations. While previous studies have examined the gap between graduate skills and employer needs, much of this evidence relies on older data and focuses on identifying gaps rather than ranking their relative importance (Al Harrasi et al., 2023, Baveja et al., 2024, Wagner et al., 2020). This study examines managers' perceptions of the skills required of logistics graduates in Israel to identify competencies that academic institutions should prioritise. Grounded in the knowledge-based view (KBV), the research positions higher education and industry as collaborators in refining strategic capabilities (Grant and Phene, 2022).

Methodology

The study utilises the Analytic Hierarchy Process (AHP) to rank the relative importance of skills expected from logistics graduates (Saaty, 1977). Data were collected between February and July 2025 from 14 managers in Israel's traditional industries, including defence, manufacturing, and retail. Participants were selected via purposive sampling based on their managerial experience and familiarity with logistics graduate skills. Consistent with AHP methodology, the study relies on expert judgement rather than large-scale sampling; all responses met the required consistency thresholds. Using pairwise comparisons, the study assessed four major skill

categories: technological, managerial, collaborative soft skills, and supply chain management (SCM).

Results

Results indicate that managerial skills received the highest overall priority, followed by SCM skills and collaborative soft skills. Technological skills were ranked as the least important category. At the secondary level, leadership emerged as the primary managerial skill, followed by financial and knowledge management. Within SCM, quality management and demand forecasting were prioritised. In the soft skills category, teamwork, communication, and problem-solving were ranked highly. Conversely, technological skills, such as database analytics and software knowledge, received the lowest priority. This suggests that managers in traditional industries continue to value human-centred capabilities over purely technical expertise.

This study makes several contributions. First, it extends the knowledge-based view by positioning institutions of higher education as organisations that create, convert, and transfer knowledge rather than merely impart knowledge to students (Grant and Phene, 2022). Second, it introduces the analytic hierarchy process as a structured mechanism for identifying and prioritising the skills gaps of logistics graduates. Third, it contributes to limited empirical literature on logistics education in Israel. Fourth, it provides a managerially grounded ranking of skill priorities, thereby offering specific guidance for curriculum redesign beyond studies identifying general skill gaps. The practical implications suggest that academic curricula in logistics should place greater emphasis on leadership, financial and project management, teamwork, communication, problem-solving, and supply chain management capabilities. Such alignment may reduce the learning curve of new hires and improve the fit between graduates' capabilities and industry expectations.

Several limitations should be noted. The sample is small, the data reflect managers from traditional industries in Israel, and the cross-sectional design captures judgments at one point in time. These conditions limit generalisability and do not allow causal inference. Future research should expand the sample, compare industries and countries, and reassess the role of technological skills as artificial intelligence and digital systems become more deeply embedded in traditional organisations.

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GROUP-BASED INEQUALITY IN PSYCHOLOGICAL CAPITAL: IMPLICATIONS FOR ORGANIZATIONAL ADAPTABILITY

Sigal, Rivka[1]; Gross-Avinir, Ohela[2]

[1,2] School of Management, Jerusalem Multidisciplinary College (JMC), Israel

Keywords: Ethnicity, Gender, Generations, Human Resources, Psychological Capital

Introduction

In VUCA environments organizational performance depends on employees' adaptability, placing HRM as central to developing psychological resources that support performance. The growing adoption of AI has further intensified workplace uncertainty, increasing the importance of Psychological Capital (PsyCap) characterized by hope, self-efficacy, optimism, and resilience (Luthans et al., 2007). As a strategic resource, PsyCap enhances adaptive performance and contributes to organizational competitive advantage (Donaldson & Villalobos, 2024). Its relevance is particularly evident in AI-driven workplaces, where higher PsyCap is associated with more positive attitudes toward AI and greater readiness for change (Carter et al., 2024).

Purpose, Aim and Objectives

Although PsyCap has been studied at the individual-level, evidence suggests that it is also shaped by social structures and collective experiences (Dawkins et al., 2015). This study examines whether PsyCap differs across ethnicity, gender, and generations and explores their relationship with AI use. Three hypotheses are tested: H1. Jewish employees report higher PsyCap than Arab employees; H2. men report higher PsyCap than women; and H3. PsyCap differs across workforce generations.

Literature Review and Theoretical Framework

PsyCap is increasingly conceptualized as a socially embedded resource shaped by broader social conditions (Dawkins et al., 2015). Unequal opportunities, structural disadvantage, and discrimination may constrain psychological resource development, with consequences for employee performance and well-being (Dóci et al., 2023).

Consistently, ethnically marginalized groups may have reduced access to social and economic conditions that foster PsyCap (Foster & George, 2025).

Evidence regarding demographic differences in PsyCap are mixed, with some studies reporting higher PsyCap among Baby Boomers and Jewish women, while others found age-related declines and inconsistent gender differences. These findings suggest that psychological resources may vary according to social context, particularly in societies characterized by social and economic inequalities such as Israel, where ethnicity and gender appear to influence PsyCap (Staples, 2014; Sigal & Michon, 2024).

These findings justify examining how ethnicity, gender, and generation contribute to group-based PsyCap differences.

Methodology and Methods

The study combines two methods. First, data from the 2023 Israeli Social Survey (ISS) were analyzed using PsyCap proxy indicators. Second, a survey using the full PsyCap scale was distributed among employed adults.

Findings and Contribution

The ISS data were strongly correlated with the full PsyCap scale, supporting its use for population-level analysis. Significant group differences emerged, with young Jewish men reporting the highest PsyCap levels, revealing intersectional inequalities across ethnicity, gender, and generation. These findings suggest that organizations may not fully leverage available human capital when psychological resources are unevenly distributed.

AI use was not significantly associated with most PsyCap dimensions; however, a negative relationship emerged between AI use and self-efficacy. Despite reporting lower overall PsyCap, Arab employees expressed more positive attitudes toward AI.

Originality and Value

This study advances PsyCap research through demographic inequalities and AI-related workplace experiences, while highlighting the population-level analysis through national survey data.

Research Limitations

The cross-sectional design limits causal inference, and convenience sampling reduces generalizability. Future research should employ longitudinal and representative samples.

Theoretical and Practical Applications and Implications

The findings support viewing PsyCap as a socially embedded resource shaped by social circumstances. Since PsyCap is malleable and cost-effective to enhance, targeted interventions may strengthen adaptability, organizational performance, inclusion, and well-being.

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STRATEGIC LEADERSHIP FOR HIGH-VOLATILITY ENVIRONMENTS: REASSESSING CLASSIC MODELS AND SYSTEMIC RISK

Chamieh, Cesar[1]; Osta, Alain[1,2]

[1] Department of Management, Université La Sagesse, Beirut, Lebanon

[2] School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Strategic leadership, Volatility, Systemic risk, Dynamic capabilities, Decision-making, Adaptive leadership, Risk awareness

Introduction

Contemporary organizations face high volatility and interconnected systemic risks. Traditional strategic leadership models, established on stability, struggle to guide decision-making under modern uncertainty. Frequent economic disruptions and geopolitical instability highlight the need to reassess these classic frameworks.

Purpose, Aim and Objectives

This study examines how strategic leadership models, specifically transformational, transactional, situational and laissez-faire/passive leadership can be adapted to address systemic risk in high-volatility contexts. The primary aim is to determine how these models influence an organization's ability to mitigate cascading systemic failures. To achieve this, the research objectives are to evaluate the correlation between specific leadership behaviors and systemic risk preparedness; to identify critical competencies, such as coordination management and systemic foresight required for risk-aware decision-making; and finally, to develop a framework that reintegrates traditional leadership theory with contemporary capabilities to enhance strategic resilience.

Literature Review and Theoretical Framework

Classic strategic leadership models including transformational leadership, transactional leadership, situational leadership and laissez-faire/passive leadership have long provided insights into leadership and organizational performance; in addition to systemic risk-related outcomes are estimated through perceived organizational effectiveness, adaptability, and preparedness.

However, existing literature reveals a significant theoretical gap: these frameworks were established within stable, predictable environments, focusing on internal hierarchies while underestimating the external, interconnected nature of systemic risk.

This study utilizes the dynamic capabilities framework (Teece, 2025) to bridge this gap, examining leadership not merely as a management style, but as a dynamic mechanism for sensing environmental signals and managing system-wide interdependencies. Within this framework, leadership serves as a critical mechanism through which environmental signals are sensed, interpreted, and translated into strategies (Heikinheimo et al., 2025).

By reframing systemic risk as an ongoing, day-to-day organizational variable (Nguyen, 2025), this research addresses the failure of classical models to mitigate cascading failures and identifies the specific leadership competencies required to maintain operational continuity in dynamic contexts.

Methodology and Methods

Adopting a positivist philosophy and deductive approach, this study pairs a conceptual reassessment with an empirical survey, employing a quantitative and a cross-sectional research design. Forthcoming data collection targets 250 risk-related decision-makers**,** utilizing a validated 5-point Likert scale to measure leadership behaviors and risk outcomes. A conceptual model is developed, proposing relationships between leadership models and systemic risk. Based on this model, four hypotheses are formulated: (H1) adaptation/integration positively influences effectiveness; (H2) overreliance on unmodified models negatively affects adaptability; (H3) risk awareness positively influences preparedness; and (H4) formal assessments/scenario planning positively affect performance. The independent variables (IV) are the adoption levels of transformational, transactional, situational and laissez-faire/passive leadership styles. The dependent variables (DV) are systemic risk-related outcomes, estimated through perceived organizational effectiveness, adaptability, and preparedness. Control variables including market, seniority level, and years of experience are incorporated to ensure statistical robustness.

Expected Findings and Contribution

Expected findings suggest that organizations that reassess classic leadership models demonstrate higher preparedness for systemic disruptions. Systemic foresight and coordination management

are anticipated to correlate with improved responsiveness to systemic failures. Furthermore, monitoring signals and the mitigation of leader cognitive biases should enhance decision-making quality to navigate volatile environments.

Originality and Value

This article contributes by reassessing the validity of classic leadership models in volatile environments, introducing a systemic risk perspective, and proposing an adapted framework that integrates resilience, agility and decision-making to better reflect the realities of unstable environments.

Research Limitations

As a cross-sectional study, findings provide a snapshot of perceptions. As data collection is ongoing, findings remain indicative and results cannot yet be generalized beyond the study sample.

Theoretical and Practical Applications and Implications

The study should advance leadership theory by integrating classic models with systemic risk theory, redefining leadership as a functional tool for resilience. Theoretically, it justifies a framework where strategic effectiveness depends on anticipation of macro-environmental shocks. Practically, the study offers guidance for leaders by providing insights to improve strategic responsiveness, and translate complex environmental signals into actionable strategies.

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DIGITAL PARTICIPATION OF SHAREHOLDERS IN GENERAL MEETINGS: ANALYSIS OF 'COMPLY OR EXPLAIN' STATEMENTS BY PUBLIC COMPANIES IN POLAND

Samborski, Adam[1]

[1]Department of Enterprise Management, University of Economics in Katowice, Katowice, Poland

Keywords: Corporate Governance, General Meeting, Digital Participation of Shareholders, Public Companies, Comply or Explain, Thematic Analysis.

Digital technologies are transforming the organisation of general meetings (GMs) and the manner in which shareholders can participate. While GM digitalisation offers many advantages, it also introduces legal and operational risks (Brochet *et al.*, 2024; Denis and Blume, 2021; ICLEG, 2022; Magnusson and Blume, 2022; Nili and Shaner, 2022; Samborski, 2026a; Sigurjonsson *et al.*, 2024; Wan *et al.*, 2021). Building on findings published in the *Future Business Journal* (Samborski, 2026b), this abstract outlines the barriers reported by listed companies when opting out of digital GM solutions.

The analysis evaluated 'comply or explain' disclosures from issuers on the Warsaw Stock Exchange (WSE) that deviated from the WSE Best Practice Principles 4.1 (remote participation) and 4.3 (real-time broadcast) (GPW, 2021, 2025). Of the 406 entities evaluated, non-compliance was recorded in 260 cases for Principle 4.1 and 268 cases for Principle 4.3 (Samborski, 2026b). These cases of non-compliance were examined using reflexive thematic analysis (Braun and Clarke, 2006, 2024).

The study identified a typology of six barriers to GM digitalisation: established procedures, cost constraints, regulatory conditions, cybersecurity, shareholder issues, and technical limitations. The reasoning behind these varies depending on the level of GM digitalisation, with distinct patterns emerging for Principles 4.1 and 4.3 (Samborski, 2026b). Analysing the disclosures of WSE-listed companies enables resistance patterns to be identified across GM digitalisation levels, as well as narratives that perpetuate a lack of organisational change (Samborski, 2026b). Reflexive thematic analysis is inherently interpretative (Braun and Clarke, 2024). This study is based solely on public statements from companies. Nevertheless, the resulting typology enriches the literature on corporate governance and serves as a useful point of reference for regulators and corporate bodies in seeking to support GM digitalisation.

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IMPROVED INTEGRATED REPORTING (IR) THROUGH THE USE OF STRATEGIC INTEGRATED COMMUNICTION (SIC)

De Lange, Lucrezea

Communication Science Department, University of the Free State, Bloemfontein, South Africa

Keywords: Integrated Reporting, Strategic Integrated Communication, Accountability, Value creation, Sustainability, Stakeholder Engagement, Corporate Governance, Triple Bottom-Line

Introduction

In an era in which news spreads as it happens, and antibusiness sentiment is high, there is increasing demand that organizations be accountable to all their stakeholders. Increased tension over exposed irregularities by businesses and growing income inequality are some of the factors that fuel this search for accountability. As a result, traditional organizational reporting methods have not been able to keep up with the complexity of not only the contemporary organization, but also the complex environment in which it functions. Organizations therefore are obliged to find new and improved ways of communicating with, and reporting to, their multiple stakeholders about long-term value creation and sustainability.

Purpose, Aim and Objectives

To address this problem, a Consultation Draft (CD) of the first Integrated Reporting Framework was released by the International Integrated Reporting Council (IIRC) in April 2013. The IIRC (2021) IR framework provides guidelines and principles on the important aspects that should be addressed when reporting on business activities, however, the important role of strategic integrated communication (SIC) is not acknowledged. It is argued here that for integrated reporting (IR) to be successful, it is necessary to acknowledge the role of strategic integrated communication (SIC) in the IR process. This study aims to explore how SIC principles can be connected to the guiding principles of IR to ensure improved IR.

Literature Review and Theoretical Framework

Contemporary organizations have come to realize that as corporate governance practices evolve to keep up with the changing environments, one-sided reporting, such as financial reporting, is no longer seen as the sole source of information on corporate performance. Investors and other stakeholders now focus on the triple bottom-line. The traditional corporate annual financial reports and stand-alone non-financial reports fail to connect societal, environmental and governance issues to core corporate business strategy and financial performance. Therefore, a combination of both types of reporting would raise awareness of the long-term sustainable development view, increase the comparability of global corporations, and reduce corporate reputational risk (Suttipun & Bomlai, 2019: 348–349). The purpose of integrated reporting (IR) is to give stakeholders a holistic view of the company as well as its future by telling the story of the company and how it creates value. For integrated reporting to be successful, it is necessary to acknowledge the role of strategic integrated communication (SIC) which assists the company in building relationships and regaining stakeholder trust to improve organizational reputations (Argenti, 2016).

Methodology and Methods

The study was approached from a qualitative paradigm, and data was collected through an integrative literature review (ILR). Five phases for systematically working through data during an ILR, as suggested by Whittemore and Knafl (2005) were applied. The phases include: (i) problem identification, (ii) literature search, (iii) data evaluation, (iv) data analysis and (v) presentation of data. These phases were applied to both SIC and IR. An integrative literature review (ILR) was particularly applicable as it allowed the researcher to go beyond an analysis and synthesis of primary research findings and provided new insights and summarized knowledge about the two specific topics (Lubbe, Ten Ham-Baloyi & Smith 2020).

Findings and Contribution

The study indicated how the seven guiding principles of the integrated report could be linked to the principles of SIC, as discussed in the conceptual model for SIC implementation (Niemann, 2015). This overlap and connection between these principles assisted in supplying guidelines for more effective IR.

Originality and Value

This study contributes to the literature by emphasizing the constitutive role of communication in the organization. The originality of the study lies in the connection of the SIC principles with the IR principles to ensure more holistic reporting.

Theoretical and Practical Applications and Implications

The findings may assist organizations in understanding SIC is fundamental in relationship building between an organization and its stakeholders. SIC also ensures that the organization is perceived as a cohesive whole (Niemann, 2005) and is the central means through which internal and external stakeholder relationships are established and maintained (Angelopulo & Schoonraad 2006).

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LEGAL DEFENSIBILITY IN LLM-SUPPORTED BANKING COMPLIANCE: A KNOWLEDGE MANAGEMENT FRAMEWORK

Vacca, Giada [1]; Iazzi, Antonio[1]; Marchetti, Pietro[1]; Stefanizzi, Pasquale[2]

[1]Department of Economics, University of Salento, Lecce, Italy

[2]Department of Management and Economics, Pegaso Telematic University, Naples, Italy

Keywords: RegTech; Large Language Models; Legal Risk; Knowledge Management; Banking

Introduction and literature review

Over the past decade, regulatory technology (RegTech) has become an important component of compliance infrastructures in banking. Digital tools are increasingly embedded in organisational processes to support monitoring, reporting, and documentation activities in response to expanding supervisory expectations (Arner et al., 2017; Anagnostopoulos, 2018). Advances in artificial intelligence (AI) have further expanded automation in compliance tasks. Large language models (LLMs) are attracting growing attention for their ability to process and generate textual information. However, the adoption of generative AI raises governance challenges when the reasoning behind automated outputs cannot be easily reconstructed or when supporting evidence remains uncertain. LLMs may produce plausible but inaccurate statements, commonly referred to as hallucinations (Bender et al., 2021), while other studies highlight risks related to the extraction or reproduction of sensitive training data. These limitations have increased attention to AI governance, explainability, and model risk management (Yeo et al., 2025). However, this debate still pays limited attention to how AI-supported compliance outputs become organisationally validated and legally defensible. KM research addresses this gap by framing compliance as a collaborative process of evidence review, interpretation validation, and rationale documentation (Alavi & Leidner, 2001). Accordingly, the key issue is not output accuracy alone, but whether compliance knowledge is traceable, validated, reusable, auditable, and defensible. This study links LLM failure modes to workflow checkpoints, knowledge-validation mechanisms, and accountability controls.

Methodology

The study adopts a conceptual design that synthesises the literatures on RegTech, AI governance, and KM through abductive reasoning (Snyder, 2019). Rather than offering a descriptive overview of LLM adoption, the framework maps key failure modes such as hallucination, automation bias, uncertainty neglect, and provenance decay to workflow checkpoints and control types. This risk–control matrix

links technological vulnerabilities to knowledge-validation mechanisms and accountable organisational actions. Legal defensibility is therefore conceptualised as the outcome of controlled knowledge flows, supported by evidence checks, escalation rules, and audit logging before decisions are finalised.

Expected findings

The use of LLMs in banking compliance processes, such as sanctions-screening narratives and transaction-monitoring notes, may increase ex post contestability and audit fragility. Decisions that initially appear acceptable may become difficult to defend when their rationale cannot be supported by verifiable evidence, particularly in high-risk onboarding or cross-border contexts (Bender et al., 2021). Overconfident outputs with weak evidence links may pass internal review yet fail under regulatory scrutiny, while template reuse can accelerate drafting but weaken provenance tracking and propagate outdated justifications. When uncertainty signals are not escalated, cases may be prematurely closed and later reopened during assurance reviews. Overall, the legal defensibility of LLM-supported decisions depends on reconstructible artefacts, including traceable evidence, temporal consistency, and clearly documented accountability.

Implications

The study reframes legal defensibility as a property of organisational workflows, not model performance alone (Carlini et al., 2021). Since weak evidence links, missing escalation mechanisms, and non-reconstructible rationales make LLM-supported outputs legally fragile, banks need controls that clarify ownership, documentation, evidence validation, and risk-based review. This operating model makes compliance outputs traceable, reviewable, and defensible under supervisory scrutiny. For regulators, the findings suggest prioritising evidence robustness, workflow transparency, and accountability over technical accuracy alone.

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NAVIGATING UNCERTAINTY: FOUNDER DECISION EPISODES, STRATEGIC DIRECTION, AND THE LOGIC OF CONTINUITY

Sharma, Steph[1]; Layes, Joachim Jake[2]; Esposito, Mark[3]; Akbar, Yusaf[4]

[1]Hult International Business School, Boston, MA, United States; EuroMed Academy Associate Fellow, Paphos, Cyprus

[2]EuroMed Academy Associate Fellow, Paphos, Cyprus

[3]Northeastern University, Boston, MA, United States; Berkman Klein Center for Internet and Society at Harvard University, Cambridge, MA, United States

[4]Central European University, Vienna, Austria

Keywords: Decision-making, Strategic Calibration, Founder Decision Episodes, Uncertainty, Artificial Intelligence, Strategic Direction, Strategy Process

Introduction, Purpose and Objectives

While strategy research explains how firms adapt to volatility, it offers less clarity on how strategic direction is sustained across decisions in high uncertainty (Baishya *et al.*, 2025). This problem is salient for founders, whose decisions often combine incomplete information, stakeholder pressure, time constraints, and AI-supported inputs. Strategic Calibration (StCal) describes the regulation of judgement and action so that adaptive moves remain aligned with broader strategic commitments under uncertainty (Sharma et al., 2025). This empirical inquiry uses StCal as a lens to examine how founders sustain strategic direction during consequential decision episodes under uncertainty.

Consequential decision episodes are defined as bounded sequences of strategic decisions that affect resource commitments, stakeholder relationships, market positioning, or venture development. The study focuses on how founders interpret uncertainty, use AI-supported cues, respond to stakeholder tensions, and regulate the timing of action. The objective is to explain how founder judgement sustains strategic direction while recognising that adjustment can also produce strategic drift.

Theoretical Framework

Complexity theory explains why strategic environments are nonlinear, interdependent, and feedback-rich, making adjustment a normal condition of founder action (Anderson, 1999). Sociotechnical cognition shows that AI-supported inputs differ from conventional information inputs because they can expand perceived options, accelerate interpretation, and complicate assessments of relevance, reliability, and accountability (Kudina and van de Poel, 2024). Strategy process scholarship highlights the problem of sustaining direction across evolving action, where strategic orientation may persist even as responses adapt under uncertainty (Weiser and Laamanen, 2022). Together, these perspectives frame founder decision episodes as a problem of adjustment under the risk of drift: how founders respond to uncertainty, AI-supported cues, and stakeholder tensions while preserving strategic direction.

Methodology

This study adopts a founder-centred qualitative design using semi-structured interviews and consequential decision-episode reconstruction, with the founder decision episode as the unit of analysis. The sample will include approximately 30 founders of operating ventures established between 2013 and 2023 who remain involved in strategic decision-making. Episodes will be selected when founders identify a bounded decision sequence that materially affected strategic direction, resource commitments, stakeholder relationships, market positioning, or venture development under uncertainty, without requiring evidence of StCal in advance. Drawing on critical-incident principles suited to eliciting significant events, actions and interpretations (Butterfield, Amundson and Maglio, 2005), analysis will use cross-case thematic comparison of uncertainty, stakeholder pressure, AI-supported cue use, timing constraints and directional continuity. Trustworthiness will be supported by episode timelines, consistent interview protocols and checks against available secondary materials.

Expected Findings, Contribution, and Originality

The study examines how founders distinguish productive adjustment from strategic drift. Directional continuity may appear through consistent strategic logic, bounded variation in action and coherence with broader commitments. Analysis will examine how AI-supported cues, stakeholder tensions and timing pressures shape judgement under uncertainty. Evidence of sustained direction without identifiable calibration practices, or of AI-supported cues

increasing drift, would refine the framework. Contribution lies in specifying observable episode-level conditions linking founder judgement to strategic continuity.

Limitations and Implications

The study is limited by retrospective reconstruction, self-report by founders, and bounded transferability across venture contexts. Theoretically, it contributes to strategy process research by specifying how strategic coherence may be sustained through repeated adjustment across consequential decisions. In practice, it helps founders, advisors, and investors distinguish productive adaptation from strategic drift amid uncertainty, stakeholder pressure, and rapid feedback. Overall, the study clarifies how strategic direction can be preserved without treating stability as the absence of change.

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EXPLORING THE DRIVERS OF INFORMATION AND COMMUNICATION INNOVATION

Peiro-Signes, Ángel[1]; Segarra-Oña, Marival[1]

[1]Management Department, Universitat Politècnica de València, Valencia, Spain

Keywords: Information and communication innovation; Digital transformation; Machine learning; Firm-level drivers; Open innovation

Introduction

The growing digitalization of economic activity has generated a distinct category of innovation focused on information processing and communication (IC). These innovations include algorithms, data architectures, digital platforms, and internal communication systems that reshape how firms coordinate, learn, and create value. Unlike traditional product or process innovations, IC innovations combine technological, organizational, and knowledge-based dimensions, making them central to digital transformation strategies. Despite their increasing strategic relevance, empirical evidence on the determinants of IC innovation remains limited, particularly at the firm level.

Purpose and theoretical background

This study aims to identify which firm-level characteristics differentiate IC innovators from other innovative firms. It integrates insights from the resource-based view and absorptive capacity theory (Cohen and Levinthal, 1990) with the open innovation perspective (Chesbrough, 2003). From this standpoint, firms' internal digital investments provide the technological foundation required to absorb and deploy new information-processing methods, while external collaboration enables access to complementary expertise. However, financial constraints and organizational rigidity may limit firms' ability to translate these resources into IC innovation outcomes.

Methodology

The analysis draws on data from the 2018 Spanish Community Innovation Survey (CIS), a nationally representative dataset harmonized under Eurostat guidelines. The sample includes

11,216 innovative firms, of which 4,256 reported innovation in information processing or communication methods. An interpretable machine-learning framework was applied, combining Extreme Gradient Boosting (XGBoost) classification with Boruta feature selection and SHAP-based interpretation. This approach balances predictive accuracy with explanatory clarity and allows identification of the most influential firm-level predictors of IC innovation.

Main findings

Results indicate that investment in digital capital is the strongest driver of IC innovation. Specifically, the share of turnover devoted to software development, database work, and data analysis emerges as the most influential predictor. Technological upgrading through the acquisition of new machinery or software based on previously unused technology also plays a key enabling role. External collaboration, particularly cooperation beyond formal R&D activities, further increases the likelihood of IC innovation, highlighting the importance of relational assets and open innovation practices. Table 1 summarizes the key variables retained by the Boruta feature-selection procedure.

By contrast, traditional in-house R&D expenditure shows a weak or even negative association with IC innovation. This suggests that conventional R&D routines, often oriented toward physical products or incremental process improvements, may not align well with the flexibility required for digital innovation. Financial constraints, captured by unsuccessful attempts to obtain debt financing, act as a modest but significant barrier, reducing firms' probability of engaging in IC innovation.

Selected features	Description
EXP_TOT_SOFT_DBA_rat	Share of turnover spent on software development, database work, and data analysis.
PUR_MES_NEW	Indicates whether the firm acquired machinery, equipment, or software based on previously unused technology.
COOP_INN_XRND	Indicates collaboration with other enterprises on innovation activities excluding R&D.

Selected features	Description
EXP_INNO_RND_IH_rat_dummy	Dummy variable indicating whether the firm had any internal R&D expenditure relative to turnover.
COOP_OTH	Captures cooperation on non-innovation-related business activities.
FUND_DEBT_NSUCC	Indicates whether the firm experienced unsuccessful attempts to obtain debt financing.

Table 1. Boruta selected attributes

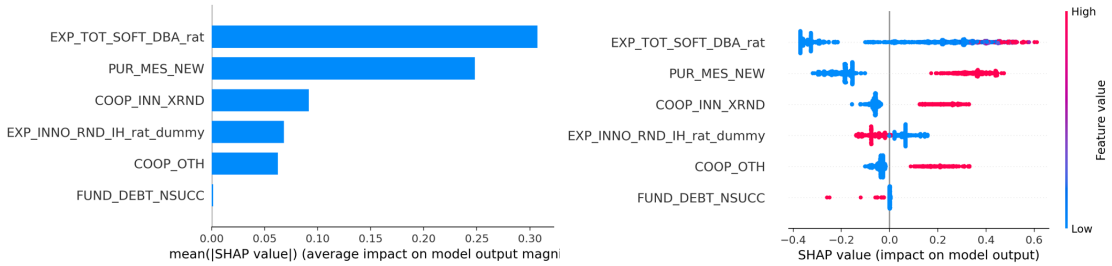


Figure 1 illustrates their relative importance and distribution based SHAP values.

Originality and value

This study contributes to the literature on digital and information innovation by clarifying how internal digital investment, external collaboration, and financial conditions jointly shape firms' engagement in IC innovation. Methodologically, it demonstrates the value of combining machine-learning techniques with interpretability tools to analyze complex innovation survey data.

Limitations and implications

The analysis is cross-sectional and limited to Spanish firms, which constrains causal inference and generalizability. Future research could adopt longitudinal or cross-country perspectives and integrate qualitative evidence. For managers, the findings highlight the importance of aligning digital investment with organizational flexibility and collaboration strategies. For policymakers, the results suggest that supporting digital capability building and reducing financial constraints may be more effective than traditional R&D-focused instruments in fostering IC innovation.

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THE ROLE OF TRUST IN ESTABLISHING DIGITAL TECHNOLOGIES: A DYNAMIC CAPABILITIES PERSPECTIVE ACROSS ORGANIZATIONS AND VALUE CHAINS

Heussner, Jochen[1]; Mybes, Katharina[2]; Hanf, Jon H.[2]

[1]Justus-Liebig-Universität Giessen, Germany

[2]Institute for Wine and Beverage Business / Economics, Hochschule Geisenheim University, Geisenheim, Germany

Keywords: Digital technology, dynamic capabilities, blockchain, trust, digital transparency, information asymmetry, wine industry

Digital technologies such as blockchain, artificial intelligence, and sensor-based traceability systems are increasingly deployed to improve transparency, coordination, and governance in global value chains (Treiblmaier, 2018; Nambisan et al., 2019; Polcumpally et al., 2024). These technologies promise to mitigate persistent information asymmetries related to quality, origin, sustainability, and authenticity (Darby & Karni, 1973; Menapace & Moschini, 2012). This applies particularly to sectors characterized by credence attributes, such as agrifood and wine. Empirical evidence shows that transparency alone does not guarantee adoption, legitimacy, or effective coordination (Grimmelikhuijsen & Meijer, 2014; Polcumpally et al., 2024). Instead, outcomes depend on whether digitally generated information is perceived as credible, relevant, and appropriately governed. Hence, trust among partners and stakeholders is a crucial factor in the successful integration of new technologies. This raises an unresolved question: how do organizations convert digital transparency into trust during technological and organizational change to ensure successful adaptation?

This paper addresses this question by bridging the literature on dynamic capabilities with research on digital transparency, information asymmetry, and trust. While dynamic capabilities theory explains firm adaptation to changing environments through a unique set of organizational capabilities (Teece et al., 1997), it offers limited insight into how adaptive outcomes become

credible to external stakeholders. The blockchain and digital transparency literature focuses on verification mechanisms and data integrity (Beck et al., 2018; Polcumpally et al., 2024), but largely neglects the organizational capabilities required to leverage these technologies strategically. Blockchain-enabled systems rely on cryptographic rules and consensus mechanisms to increase confidence in data integrity. Trust shifts from interpersonal relationships and institutional intermediaries toward data infrastructures, governance arrangements, and their operators (De Filippi et al., 2020; Feroz et al., 2023). However, digitally generated information only creates value when stakeholders perceive it as credible and trustworthy. The aim of this study is to advance the understanding of establishing trust in digitally mediated organizational and inter-organizational contexts.

This conceptual paper develops a theory-based framework by integrating dynamic capabilities with information economics and digital governance research. The proposed framework is illustrated through three empirical cases from the wine and spirits sector, which demonstrate the proposed mechanisms without constituting a multiple-case study or theory test.

It is proposed that dynamic capabilities enable the formation of trust capital through digital transparency. Trust capital is conceptualized as a capability-based organizational resource: the accumulated stock of verifiable, data-based credibility generated through digital transparency that organizations can strategically build and leverage to support coordination, governance, and innovation across organizational and institutional boundaries. Organizations with strong dynamic capabilities are better able to adopt, govern, and communicate digital technologies, thereby increasing stakeholders' confidence in the integrity and relevance of shared information.

Digitally embedded sensing capabilities enhance the identification of risks and opportunities by enabling access to reliable shared data. Seizing capabilities support coordinated investment and alignment by reducing uncertainty about information quality. Transforming capabilities embed transparency into organizational routines and governance structures, stabilizing trust capital over time. The framework proposes that organizations with stronger dynamic capabilities are better able to develop trust capital, thereby strengthening innovation governance by lowering coordination costs, facilitating collaboration, and supporting legitimacy in complex institutional environments.

This paper contributes by explaining how dynamic capabilities support trust formation under digital transparency, advancing the trust-versus-confidence debate in blockchain research, and

reframing blockchain as an organizational and governance technology rather than standalone infrastructure. For managers and value-chain stakeholders, the framework explains how dynamic capabilities can be leveraged to establish digital technologies by building stakeholder confidence across organizational boundaries, and to increase acceptance and support of adaptation activities. As a conceptual study, it does not provide empirical hypothesis testing. Future research should operationalize trust capital empirically and test the proposed framework across different industries and value-chain contexts.

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National R&D Policies and Early-Stage Firms Internationalization: Uncovering a Strategic Paradox under Uncertainty

Kalogera, Maria[1] , Georgopoulos, Antonios[1], Aggelopoulos, Eleftherios[1], Georgopoulos, Nikolaos[2]

[1] Department of Business Administration, University of Patras, Greece

[2] Department of Social and Behavioral Sciences, European University Cyprus

Keywords: Early-Stage Entrepreneurship, Global Strategic Orientation, Strategic Decision-Making, Uncertainty and Turbulence, R&D Policy, Resource Reallocation, Gender and Entrepreneurship.

Introduction

In an increasingly volatile market, the internationalization of early-stage firms is vital for competitiveness. However, despite R&D subsidies and innovation policies, we lack understanding of how these drive a firm's expansion into foreign markets.

Purpose, aim and objectives

This study examines how R&D support and growth expectations influence the export orientation of early-stage firms, focusing on how entrepreneurs allocate resources between international expansion and internal consolidation during periods of uncertainty. Additionally, we examine gender as an independent driver. By investigating micro- and macroeconomic factors, this research clarifies how funding, growth ambition, and gender dynamics shape internationalization strategy.

Literature review and theoretical framework

This study draws on the resource-based view to argue that firms treat international expansion and domestic consolidation as competing claims on a finite pool of resources. While research suggests that R&D policies and growth expectations foster internationalization, we propose that their reinforcement signals resource commitment, prompting a precautionary reallocation toward the domestic market. This reframes the paradox as a risk-management response rather than a capability gap, extending strategic adaptation theory to institutional support and entrepreneurial ambition under turbulent conditions.

Methodology and methods

The empirical analysis is based on panel data drawn from the Global Entrepreneurship Monitor, covering 56 countries over 2009-2020, a period successive crisis (financial crisis, Brexit, Covid-19). Early-stage firms are defined per GEM criteria up to 3.5 years old. Export orientation is measured as the share of sales derived from international markets. R&D support and growth expectations are captured as distinct variables, alongside gender, market-environment controls. The analysis leverages the System GMM estimator, which addresses endogeneity, temporal interactions among variables, testing direct effects of R&D support, growth expectations, and gender, and interaction effects.

Main findings and contribution

National R&D support and high growth expectations enhance the export performance of early-stage ventures. However, their interaction generates a negative effect on internationalization: firms combining strong R&D support with high growth expectations show a lower propensity to export intensively, and descriptive patterns confirm that ventures with the highest export intensity report comparatively lower growth expectations and R&D engagement than firms with moderate export activity. This is consistent with a risk-averse allocation logic in which entrepreneurs prioritize internal consolidation before committing resources abroad. Gender independently shapes this pattern: female entrepreneurs show a more conservative resource-allocation profile, consistent with risk management rather than a weaker growth orientation.

Originality and value

The core contribution of this study is to show that limited internationalization among early-stage ventures reflects deliberate, sequential resource allocation under uncertainty rather than a deficit of resources or capabilities. By identifying this strategic paradox the study extends strategic adaptation theory to institutional support and entrepreneurial ambition and reframes gender differences in export behaviour as risk management rather than underperformance.

Research limitations

The study's limitations stem from the use of secondary GEM data does not capture the firm-level decision-making process. Although the System GMM estimator addresses endogeneity, it

does not establish firm-level causality. Future research should draw on micro-level data to trace how entrepreneurs sequence internationalization and consolidation decisions under uncertainty.

Theoretical and practical implications

Theoretically, the findings extend strategic adaptation theory by showing that innovation support and growth ambition can jointly suppress, outward orientation. Practically, the results point to three policy levers: reducing labour costs and offering tax incentives tied to job creation; strengthening university-startup R&D linkages alongside subsidies; and pairing R&D support with internationalization instruments such as export-credit insurance and fast-tracked administrative procedures. Innovation policy that pursues growth and technological upgrading without these complementary mechanisms risks reinforcing, rather than resolving, the strategic paradox. Support programs should account for gender-specific differences in resource allocation, including targeted mentoring and financing instruments that address the funding gap facing female entrepreneurs.

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FEMALE AGRI-ENTREPRENEURS AS CONNECTORS BETWEEN AGRICULTURE AND RURAL TOURISM RESILIENCE IN CYPRUS

Stylianou, Christiana[1]; Liasidou, Sotiroula[1]; Papatheodorou, Andreas[2]; Manganaris, George[3]

[1]Faculty of Tourism Management, Hospitality and Entrepreneurship, Cyprus University of Technology, Paphos, Cyprus
[2]Department of Tourism Economics and Management, University of the Aegean, Chios, Greece
[3]Department of Agricultural Sciences, Cyprus University of Technology, Limassol, Cyprus

Keywords: Female Entrepreneurship, Agri-entrepreneurs, Rural Tourism, Tourism Resilience, Small Islands, Agriculture, Policy

Introduction

Rural tourism is increasingly intertwined with local agricultural production, cultural heritage, and small-scale entrepreneurship (Ivona, 2021). In many rural destinations, agri-food products are central to tourism experiences (Liu et al., 2017), linking local production with gastronomy, culture, and place identity (Gulisova, 2022). Within this context, female agri-entrepreneurs often play a critical role in sustaining rural economies and enhancing tourism offerings through food processing, experiential tourism, and participation in local networks that support destination development (Singh et al., 2022; Martini et al., 2020). Despite growing attention to rural entrepreneurship and tourism resilience, the specific role of female agri-entrepreneurs as actors connecting agriculture and tourism remains underexplored, particularly in small island contexts (Dimick et al., 2025; Rytkönen et al., 2023).

Purpose, Aim and Objectives

The purpose of the study is to explore the role of female agri-entrepreneurs in linking agricultural production with rural tourism development and tourism resilience in Cyprus. The study aims to understand how institutional stakeholders perceive the contribution of female agri-entrepreneurs to tourism diversification, local development, and the adaptive capacity of rural destinations. The research is guided by the following questions:

1. How do female agri-entrepreneurs contribute to linking agricultural production with rural tourism development in Cyprus?

2. How do institutional stakeholders perceive the contribution of female agri-entrepreneurs to tourism diversification, local development, and tourism resilience in rural Cyprus?
3. What structural and policy-related challenges and support mechanisms shape the capacity of female agri-entrepreneurs to contribute to rural tourism resilience?

Literature Review and Theoretical Framework

The study draws on literature on rural entrepreneurship, gender and entrepreneurship, and tourism resilience, situated at the intersection of tourism studies and entrepreneurship research. Research on rural entrepreneurship highlights the role of small and medium enterprises in sustaining rural economies and diversifying tourism products through locally embedded activities (Apostolopoulos et al., 2020; Cunha et al., 2020). Gender-focused work emphasises that women's entrepreneurial practices are shaped by social, institutional, and spatial conditions that structure opportunities and constraints in rural environments (Welter et al., 2014). Studies of contextual entrepreneurship further show that enterprises integrating social objectives (Aquino et al., 2018), such as community well-being and cultural preservation, can contribute to local development outcomes. Tourism resilience literature focuses on the capacity of tourism systems to absorb, adapt, and transform in response to external shocks (Cochrane, 2010) and structural pressures through diversification, collaboration, and innovation (Weidenfeld, 2018). Limited attention has been paid to how female agri-entrepreneurs, operating at the intersection of agriculture and tourism (Stylianou et al., 2025), and may function as boundary-spanning actors within resilient rural tourism systems (Mugion et al., 2026).

Methodology and Methods

The study employs a qualitative research design based on 24 semi-structured interviews with stakeholders involved in tourism and rural development in Cyprus. Participants include representatives from tourism organisations, agricultural institutions, public authorities, and local development bodies that interact with or support female agri-entrepreneurs. Interviews explore stakeholder perceptions of the role of female agri-entrepreneurs in tourism development, policy initiatives and support schemes, access to financial and training resources, and structural and gendered barriers to entrepreneurial activity. Data is analysed through thematic analysis to identify recurring patterns and tensions across stakeholder perspectives in relation to the three research questions. The study adopts an inductive approach, allowing conceptual insights to emerge from the data rather than testing a predetermined theoretical framework.

Main Findings and Contribution

Findings indicate that female agri-entrepreneurs are perceived as central contributors to rural tourism diversification through the development of local agri-food products,

gastronomic experiences, and cultural heritage activities. Their enterprises strengthen the authenticity and distinctiveness of rural tourism offerings and promote collaboration among local businesses and community actors, embedding tourism within local socio-economic networks. Stakeholders acknowledge that female agri-entrepreneurs promote locally produced goods in tourism markets, enhance the visibility of rural destinations, and support community cohesion. At the same time, their contributions are constrained by bureaucratic complexity, fragmented regulatory frameworks, limited access to finance and tailored training, and gendered expectations regarding care and family responsibilities. Existing policy tools and support mechanisms tend to be generic and poorly coordinated across agricultural, tourism, and regional development domains, which restricts the extent to which women's enterprises are recognised and mobilised as strategic assets for tourism resilience. The study contributes conceptually by framing female agri-entrepreneurs as boundary-spanning, connective actors between agriculture and tourism in small island rural contexts.

Originality and Value

The research offers originality by focusing on female agri-entrepreneurs as key connectors between agricultural production and rural tourism resilience in a small island setting where geographic peripherality, limited market scale, and institutional centralisation compound the constraints common to many rural contexts. It integrates perceptions from rural entrepreneurship, gender studies, and tourism resilience to highlight how gendered, context-specific entrepreneurial activities underpin diversification and adaptive capacity in peripheral destinations. In addition, the study advances debates on contextual and gendered entrepreneurship by demonstrating how women's agri-enterprises contribute to both economic and socio-cultural dimensions of rural tourism resilience.

Research Limitations

Findings are based on qualitative interviews with institutional and organisational stakeholders and therefore reflect mediated interpretations of female entrepreneurs' roles, rather than entrepreneurs' own accounts. As institutional representatives, participants may also tend to understate their organisations' shortcomings or to project normative assumptions onto the gendered barriers entrepreneurs face, a limitation that warrants interpretive caution. Moreover, the focus on the Cypriot rural and policy context may limit the transferability of the results to other destinations with different socio-economic structures and governance arrangements.

Theoretical and Practical Implications

Theoretically, the study contributes to discussions on contextual entrepreneurship and tourism resilience by conceptualising female agri-entrepreneurs as boundary-spanning actors that connect agricultural and tourism systems in small island rural contexts. In practice, the findings underscore the need for integrated policy frameworks that explicitly acknowledge and support women's agri-tourism enterprises. Improved

coordination between agricultural, tourism, regional development, and gender equality policies, along with targeted financial, training, and advisory support, could enhance the capacity of female agri-entrepreneurs to contribute to rural development and destination resilience.

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DIGITALIZATION AND DIGITAL TRANSFORMATION IN ITALIAN BANKS' NON-FINANCIAL REPORTS

Rudko, Ihor[1] Fedele, Maria[1] Formisano, Vincenzo[1]; Lena, Grazia Maria Alessandra[1]

Department of Economics and Law, University of Cassino and Southern Lazio, Cassino, Italy

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Abstract

In this paper we analyse how banks in Italy approach the topics of digitalization and digital transformation in their non-financial reports. In particular, we hypothesize that the two topics are distinct, not only in terms of their conceptual breadth, but also with respect to structural homologies that exist between types of banks that are more likely to address one topic or the other. To explore this thesis, we perform a Geometric Data Analysis (GDA) to construct and interpret the geometric space of Italian banks. The latter is built considering a variety of structural, managerial and institutional factors pertaining to the context in which said banks are immersed. We then project onto this space a supplementary variable denoting the prevalence of either digital transformation of digitization narratives in respective non-financial reports. As emerges from the results, digitalization is a common category to most banks in terms of their global average profile whereas digital transformation is commonly addressed by a subset of banks with a more unique profile of factors. The originality and value of our results is positioned alongside three axes. First, it expands current literature analysing how the topic of "digital" is approached in banks' reporting. Second, it does so by means of a novel methodological approach within business and management studies: geometric data analysis. Third, we analyse a particular context: that of Italy. The results, therefore, are also important with respect to managerial implications that these imply. Consequently, the results carry important implications for banking managers and strategists.

Introduction

In the last few years, the growing attention towards sustainability, digitalization and digital transformation (Forcadell et al., 2020) has led banks to integrate references to the "digital"- related themes and topics increasingly often into their non-financial reports. The literature shows that digitalization is typically portrayed as a lever for efficiency, transparency and sustainable innovation. Yet, recently, more nuanced and less explored areas of potential inquiry have emerged with respect to the topic, for instance, concerning social aspects of sustainability (Mavlutova et al., 2022). Similarly, how the topics of digitalization and digital transformation are understood, thematized, and narrated in banks' non-financial reports remains little-to-no explored, particularly in specific contexts such as Italy, characterized by a rapid evolution of non-financial reporting (Fedele et al., 2025).

This study aims to fill this gap by analysing the use of the terms *digitalization* and *digital transformation* in the sustainability reports of Italian banks. To the best of our knowledge, the related semantic content of banks' non-financial reports has, so far, not been explored from a managerial perspective. Accordingly, the research goal of this article is the following:

RG: To explore how the topics of digitalization and digital transformation in non-financial reports are related to the managerial, structural, and institutional characteristics of banks within a particular ecosystem of banking enterprises.

Literature review

Digitalization and digital transformation in the banking sector

Digitalization and digital transformation are two terms that are often used interchangeably, generating a plurality of competing meanings in the literature (Iyamu et al., 2021).

At the basic conceptual level the difference between digitalization and digital transformation is akin to that between any organizational change and innovation proper; or, focusing exclusively on the subject of innovation, the difference between incremental and radical/disruptive innovations (Schilling, 2013) and, read in this light, the contrast adopted in the study does not simply pertain to a lexical choice. In fact, the literature suggests treating the two terms as qualitatively different configurations that have a different impact on value creation (Calderón-Monge & Ribeiro-Soriano, 2024).

In other words, while digitalization is a process that every (financial) organization is forced to undergo due to the unremitted pace of technological progress, digital transformation calls for more in-depth strategic levering of said digitalization processes. It is therefore methodologically and conceptually sound to distinguish two terms.

When it comes to banking sector, in response to competitive pressure and the increasing diffusion of new technological operators such as FinTech (Nguyen, 2025) that provide innovative financial products and services (Barroso & Laborda, 2022), banks are accelerating their efforts to implement digitization at all levels of activity, considering it a key strategy for development (Nguyen, 2025). In his study of the banking context of Vietnam, Nguyen et al. (2023) concluded that digitalization has a positive impact on the profitability of banks, because it contributes to a significant reduction in bank operational costs, reflected in the improvement of the cost/income ratio and favours the growth of income—not from active interests, but rather obtained through the diversification of products and services offered by banks. The effects of digitalization extend from mere economic performance to sustainability objectives. In fact, digitalization and digital transformation contribute to the sustainable development of the banking sector, not only making it more efficient, for example through the reduction of subsidiaries, the reduction in the usage of paper, etc., but also through the positive impact on the social context, generating a greater financial inclusion (Mavlutova et al., 2022) and digital literacy. The transition from traditional banking business models to digital ones implies the migration of services to digital channels and also a redefinition of the needs and expectations of clients in terms of personalization of services and the speed of use. This does not only concern the application of digital technologies, but also a reconfiguration of the skills of the workforce that must be oriented to the analysis and management of data, cybersecurity, management of digital platforms and transversal and tacit capabilities related to innovation (António Porfírio et al., 2024).

Unlike the broader digitalization, the digital transformation of traditional banking operations is not limited to the automation of existing processes, but it implies a profound revision of the ways in which financial intermediaries interact with customers, organize their own internal processes and generate value, contributing to increasing customer satisfaction and involvement, strengthening the quality of the relationship between financial institutions and users and financial literacy (Naimi-Sadigh et al., 2022; Omarini, 2017). The digital transformation in the banking sector, therefore, represents a structural response to the needs of the contemporary economy, characterized by a growing centrality of digital technologies in daily activities (Bueno et al., 2024). Tian et al. (2024) posits that, in order to allow all banks to evolve in their competitive environment, digital transformation requires the development of a digital strategy oriented to all customer needs, the enhancement of information technology (IT) security measures and data protection, the updating of IT infrastructures, and, within the organizational field, the diffusion of a digital culture that favours the development and evolution of internal skills.

Numerous studies show that digital transformation contributes to improving the operational efficiency and profitability of banks, increasing the capacity for innovation and simultaneously

improving customer experience through the reduction of operational costs and the automation of processes (Alqararah et al., 2025; Ayadi et al., 2025; Verhoef et al., 2021). For instance, in their analysis of Chinese banks, He et al. (2025) emphasize how digital transformation improves the operative performance of the banks. Recent studies have also shown that the adoption of digital lending platforms and data driven technologies for credit scoring not only improves operational efficiency, but also affects risk management, capital allocation quality and bank ESG metrics (Nguyen et al., 2023). Although there are numerous advantages and opportunities that the digital transformation brings about, it is also not without challenges and risks. Some of these are: the complexity of legacy systems that limit and slow down the digitalization process and the lack of adequately trained personnel that require investment in training. To these we must also add a need for proactive and effective management of cybersecurity risks on the part of banks and regulatory authorities (Saadaoui & Chouchene, 2024), as well as issues related to resistance to change (Diener & Špaček, 2021).

Although some studies show a positive impact on profitability (Alqararah et al., 2025; He et al., 2025; Podder & Ghosh, 2026), in others, in early stages or in contexts of market saturation, negative or non-linear effects are evident (Yang & Masron, 2023; Nguyen-Phuong et al., 2023).

This is because the most recent studies state that the effects of digitization and digital transformation are heterogeneous, depending on the characteristics of banks and the digital financial literacy of the customer (Podder & Ghosh, 2026).

In light of this, the effects are not universal and univocal, but influenced by the characteristics and context in which the bank operates.

Consequently, the digital transformation is essential for bank that want to achieve and maintain a competitive advantage given the positive effects it has on profitability, effectiveness, efficiency, and performance (Saadaoui & Chouchene, 2024), yet one has to manage the related risks adequately.

Digitalization and digital transformation in non-financial reporting of Italian banks

The topics related to digitization and digital transformation that are communicated within non-financial reporting are part of a context that is undergoing major regulatory transformations.

The Italian banking sector has for years been going through a profound process of structural transformation in order adapt to all the multiple pressures arising from compliance obligations, market demands and technological development (Stefanelli & Manta, 2023; Vial, 2021). Furthermore, over the past 20 years, the European regulatory framework for reporting has undergone significant transformation, including with respect to banks, which have become increasingly subject to non-financial reporting constraints. The context of Non-Financial Reporting (NFR) in Italian banks is strongly influenced by European regulatory developments; the transition from the Non-Financial Reporting Directive (NFRD) to the Corporate Sustainability Reporting

Directive (CSRD), whose central objective is to harmonize and enhance the quality of sustainability-related information, has expanded the scope of banking entities required to report and required the adoption of the European Sustainability Reporting Standards (ESRS) proposed by the European Financial Reporting Advisory Group (EFRAG) (Fedele et al., 2025). Disclosure of digitalization and digital transformation in non-financial reports often reflects the organization's level of digital maturity and management's ability to govern complex change processes, rather than the mere implementation of technological tools. As Niehoff (2022) states, digitalization content in non-financial reports should be interpreted as a signal of management's strategic priorities and the organization's ability to integrate economic and sustainability objectives into decision-making processes. This perspective is aligned with the theory of signalling and with that of legitimacy. The first, developed by Spence (2002), according to whom companies rely on the dissemination of information to communicate to the market their own skills, financial stability and long-term strategic vision. The intent is to stand out from the competition and attenuate the existing informative asymmetry conditions, as evidenced in several recent studies (López- Santamaría et al., 2021).

The legitimacy theory (Suchman, 1995; Deegan, 2002) shows that disclosure can also take on the role of a symbolic tool to obtain social approval (Pozniakovska et al., 2025; Velte, 2025). This is particularly sensitive in the financial sector, where a persistent gap between declared behavior and actual practice is documented (Caby et al., 2020). The evidence on the impact of mandatory reporting is counterintuitive: analyzing the EU Directive, Tariq (2025) notes that the introduction of the obligation has widened the disclosure-performance gap, pushing towards transparency that is more symbolic than substantive, with marked differences by country and sector.

The abundance of qualitative details and the selection of digital elements highlighted in the report can be interpreted as a set of "intent" and "camouflage" signals. Accordingly, digitalization and digital transformation do not produce exclusively technological or operational effects, but significantly impact managerial decisions and banking governance mechanisms (Tariq, 2025). Analysing the existing literature, we have found only limited research on how digitalization is communicated in banks' non-financial reports. Three references are of particular relevance. To begin with, Diener and Špaček (2020) analysed the sustainability reports of 113 German banks. They concluded that the disclosure of digitalization is predominantly qualitative and partially covers the requirements of the German Sustainability Code (GSC). In the second instance, it should be noted that the references to the term "digital" are multiple, but they mainly refer to certain criteria defined by the said GSC. In particular, banks refer to topics like materiality, innovation, efficiency, innovation, and the use of natural resources, while digitalization and digital transformation are rarely mentioned apropos of social aspects, generating what the authors define as "structural inequality" in the sustainability

reporting regarding digitalization. By conducting a study on Jordanian banks, Shehadeh, (2025) analysed how such institutions communicate the strategy of digital transformation within their reports. The author found that there is a clear predominance of qualitative descriptions compared to the use of quantitative metrics and that the banks tend to communicate more about their commitment to innovation, operational excellence, and customer-oriented solutions, compared to more immediate issues of cyber-security and regulatory compliance, which are marginally mentioned. Finally, with respect to the Italian context, Bernini et al. (2021), by studying the main Italian banking groups, constructed a digital disclosure index to assess information on the development of digitalization, broken down into human, structural, and relational activities. The results show that the bank's reputation is influenced by the effectiveness of digitalization and that it is communicated, affirming that it is integrated at a systematic level and not considered in isolation.

In the light of the above considerations, we hypothesize the following:

HP1: Digitalization is the term common to the non-financial reports of an Italian bank with an "average" profile of heterogenous managerial, structural, and institutional characteristics.

HP2: There exist a structural homology between banks addressing digital transformation in their non-financial reporting and a subset of banks with different-from-average profile of managerial, structural and institutional characteristics.

Data collection and coding

The data gathering was conducted by means of a qualitative content analysis (Krippendorff, 2018), applied to the non-financial report of Italian banks referring to the year 2024. The use of content analysis has been widely validated in literature (Vourvachis & Woodward, 2015) as means to classify information in determinate categories (Guthrie et al., 2004). To construct the dataset, we downloaded the list of banking institutions operating on the Italian territory from the Banca d'Italia website.

Regarding the context of the reports published in 2025 and related to 2024, it was primarily marked by the start of the application of the CSRD. The latter strengthens the standard of non-financial reporting, even for banks already subject to the NFRD. Accordingly, we have restricted our selection of banks to those already applying CSRD (257 out of initial 339 banks). Subsequently, the remaining banks were categorized as those belonging to a banking group and those that are independent. Banks belonging to a group were aggregated according to their group of origin, while the others were treated as individual entities. This decision stems from the fact that banks belonging to banking groups issue a single consolidated financial statement for the entire group. This further

selection criterion has lead to the final sample of 50 banks whose non-financial reports were then downloaded directly from the respective official websites.

The analysis of 50 reports was carried out using qualitative data analysis software (MAXQDA, version 24.11.1). The key term “digital” was searched for in all texts, without distinction between uppercase and lowercase letters. The total number of occurrences extracted was 4948; after eliminating all the duplicates and non-pertinent extract, 2801 text snippets were analysed manually. By means of deductive coding (two code categories were decided in advance), we coded the text passages according to their emphasis mainly on digitalization or, more strictly, on digital transformation.

Besides the above information, for each bank in the sample additional qualitative and quantitative information was retrieved as secondary data from sources available on-line. Given the methodology applied (see the following section), all the quantitative variables were categorized into qualitative. All the variables contained in the dataset as well as their modalities are reported in Table 1 in the *Results and interpretation* section. In particular, the qualitative and quantitative data (location of registered office, legal form, specialization, and branches) for the dataset were collected using the Moody's-Orbis database (Bureau van Dijk), which provides demographic and structural information acquired from official and verified sources. The breakdown by specialization is consistent with that indicated by (Qi et al., 2025), who divided banks into three macro categories: commercial banks, mainly active in a combination of retail banking, wholesale banking, and private banking; depository institutions, which include cooperative banks, savings banks, and specialized governmental credit institution; non-depository institutions which include bank holding companies, finance companies, and investment banks. Initially, 224 coded segments and the related information about 50 banks entered the final dataset. However, due to constraints of methodology and the respective necessity to eliminate rows with missing values from the final analysis, 204 coded segments and the complementing structural, managerial, and institutional information about banks entered the analysis.

Methodology

Given the viable systems approach underlying the conceptual positioning of the paper (Badinelli et al., 2012; Barile et al., 2014; Barile & Saviano, 2011), we opted for Geometric Data Analysis as our primary methodological tool (Kirby, 2000; Le Roux & Rouanet, 2005). In particular, among various “flavours” of GDA, we follow the approach as it is currently developed by the French school (Le Roux & Rouanet, 2005) in the wake of methodological innovations first introduced by mathematician Jean-Paul Benzécri (see, for instance, Benzécri & Bellier, 1976) and then widely

applied and popularized by no other than Pierre Bourdieu (Bourdieu, 2016). GDA, therefore, is currently the most famous within sociology when it is typically used to construct and analyse complex geometric spaces of cultural tastes, political and class positions, etc. (Boelaert & Ollion, 2025; Hillier, 2001; Lebaron, 2021; Mundt & Horvath, 2018). Conversely, this type of analyses has rarely been used in business and management research.

Our methodology represents a novel approach within the field for which we strongly advocate as it (1) transcends the common separation between exploration and confirmation, (2) treats underlying empirical reality as complex and interwoven collection of factors that are not conceptually separable, and (3) reasons in terms of structural homologies between multifaceted phenomena and is, therefore, immune to common "most parsimonious model" approaches.

The above homological comparison is accomplished with respect to complex geometric spaces built by heterogenous quantitative and/or qualitative variables that, ideally, should adequately represent the filed in question. Practically speaking, doing a proper GDA consists in applying multiple correspondence analysis and/or principal component analysis frequently supplemented by an ascending hierarchical clustering (Hjellbrekke, 2018). As such, the application of the mentioned techniques is not unique to GDA (see, for instance, the review of MCA by Koutsoupias, 2026). What is, instead, unique is how the said interpretations and homology reasoning is conducted. Unlike in cases where these dimensionality reduction techniques are applied within the framework of exploratory data analysis to obtain measurable indicators of underlying latent variable, the emphasis is precisely on the visual exploration of the cloud of individuals and categories. Homological structures as denoted by supplementary categories are typically projected on the cloud of individuals. Their joint reading and comparison with the graph reporting most the categories that has contributed the most (above average) to the construction of the dimensions allows for conclusions with respect to the totality of a complex (social) filed in question. At this point it is also worth mentioning that beyond mere exploration the methodology allows for inferential conclusions as well (Hjellbrekke, 2018). These, however, are always secondary to the GDA primarily goal—a proper in-depth interpretation of dynamics structuring a complex social, including organizational, fields (Roux & Rouanet, 2004).

Results

Given the qualitative nature of our data, the GDA approach we have followed consists of multiple correspondence analysis supplemented by ascending hierarchical clustering. In total, six variables (Q = 6) with jointly twenty-seven active modalities (K = 26) contributed to the creation of the

geometric space of Italian banks. One variable were chosen as supplementary with two supplementary categories in total. These are recapitulated in Table 1.

Active variable	**Modalities**	**Explanation**
business_model	diversified SI focused-retail market-engaged wholesale-retail hybrid	Diversified. This type of bank operates on the international market, and its core business is focused on providing loans financed by retail deposits and securities. Focused retail. These are banks that operate in the domestic market, providing traditional services to customers (deposit acquisition and lending). Market-engaged. Their core business is focused on equity and bond investments and interbank transactions, including international transactions. Wholesale-retail hybrid. These are banks that operate through financial transactions carried out between professional intermediaries and large operators.
location	south, center north	The geographic location (within Italy) of the headquarters.
rank_quart	very low, low, high, very high	Country rank by assets. The qualitative variable was rendered categorical based on bank's position with respect to four quartiles.
legal_form	S.C.p.A S.P.A Soc. Coop	Società Consortile per Azioni. Analogue to Joint Venture (JV) Corporation or a Consortium Company. Società per Azioni. Analogue to PLC and Inc. Società Cooperativa. Analogue to Co-operative Society and Co-op.
specialization	Bank holding company, Commercial bank, Cooperative bank,	Bank holding company: A parent corporation that does not provide banking services itself but owns a controlling interest in one or more banks. Commercial bank: A financial institution that focuses on providing checking and savings accounts, loans, and other financial services to businesses and the public.
	Investment bank, Savings bank	Cooperative bank: A member-owned financial entity where customers are also owners who democratically control the institution to provide themselves with better rates and services.
		Investment bank: A specialized bank that helps corporations and governments raise capital by underwriting and issuing securities and providing advisory services for mergers and acquisitions.
		Savings bank: A financial institution primarily focused on accepting individual consumer deposits and providing mortgage loans and other small-scale credit products.
branches_quart	very low, low, high, very high	The overall number of branches. The qualitative variable was rendered categorical based on bank's position with respect to four quartiles.
Supplementary variable	**Modalities**	**Explanation**
digital_type	digitalization digital transformation	The presumed difference between the two is explained in detail in the literature review section

Table 1. Active and passive variables in the dataset. Source: own elaboration

The variables were selected to represent most closely the structural, managerial and institutional characteristics of Italian banks. After running MCA on 6 active variables, a geometric space of Italian banks was constructed. According to the common criterion (Hjellbrekke, 2018), the number of dimensions retained for the interpretation are those that jointly explain at least 80% of adjusted

inertia. Accordingly, as can be seen in Table 2, we have retained the first two dimensions for the subsequent interpretation.

Dim	Eigenvalue	Var	Adj. var	Cum%
1	0.721	20.6	73.7	73.7
2	0.390	11.2	12	85.7

Table 2. Eigenvalues and explained inertia. First two dimensions. Source: own elaboration

To interpret the two axis, it is useful to look at which categories has contributed the most to the creation of the two axes. In particular, these are categories with more-than-average contribution to the axis (>1/K; hence > 3.8%). To simplify and guide the interpretation, we now report the same result on the two graph (one for the first dimension contributions and one for the second dimension).

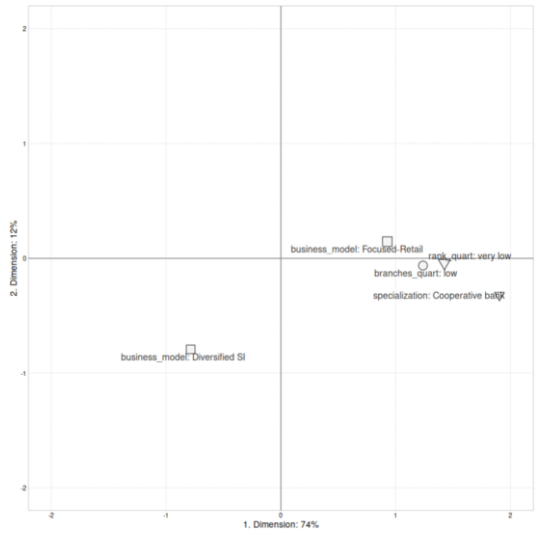


Figure 1. Most contributing categories to the first dimension

Source: own elaboration

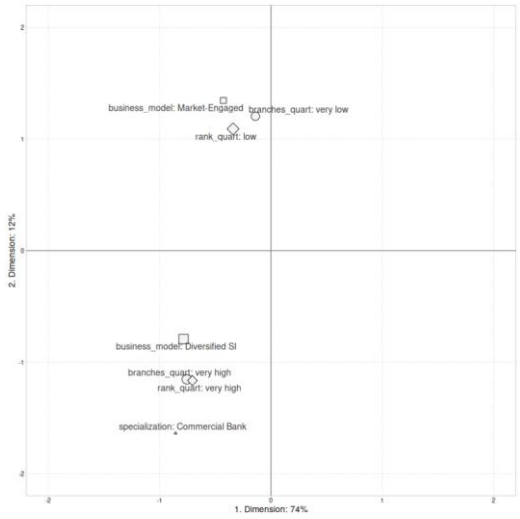


Figure 2. Most contributing categories to the second dimension

Source: own elaboration

The first axis is the primary driver of variance in the dataset, accounting for 74% of the inertia. It represents a continuum between small-scale local banking and large-scale international banking. The positive side of the axis is strongly characterized by cooperative banks with a Focused-Retail business model. These institutions typically have very low asset ranks and a very low number of branches. Geographically, they are often associated with the South of Italy. The negative side is defined by the Diversified SI business model. These are the larger, more complex institutions operating on international markets. Hence, dimension one distinguishes small, south-based cooperative entities (operating traditionally with low resources) from large, diversified banking groups. The second axis accounts for 12% of the variance and differentiates banks based on their specific market engagement and physical reach. The positive side is associated with the Market-Engaged business model. These banks focus on equity/bond investments and interbank transactions rather than traditional branch-heavy retail. Consequently, they show very low branch quartiles and

low asset ranks. The negative side is dominated by Commercial Banks and the Diversified SI model. These institutions are characterized by a "very high" physical presence (very high branches) and very high asset ranks. Hence, dimension 2 distinguishes specialized, market-oriented banks (which operate with fewer physical branches) from large commercial giants that maintain extensive branch networks and high asset volumes.

Finally, to test the two hypotheses, we proceeded by reasoning in terms of structural homologies. Therefore, we projected the supplementary variable distinguishing whether respective coded text segments in non-financial reports are centred on digitalization or digital transformation on the overall geometric space of Italian banks (the graph of individual observations). Figure 3 reports the two local barycentres of the two supplementary categories. Accordingly, even if the respective variable did not partake in the construction of the axes, the barycentres denote points of "local gravity" around which most an average profiles with that particular category gravitate. In support of the first hypothesis, the local barycentre for "digitalization" almost coincided with the global barycentre. This means that the average profile (in terms of the categories it possesses) of an average Italian bank as structured by the two axes is not different from the average profile of a bank that mentions digitalization in its non-financial reports. The situation is, however, different for the "digital transformation" category. To begin with, the two modalities are significantly different in terms of the bank profiles they represent. This is evident due to the respective confidence ellipses being non-intersecting.

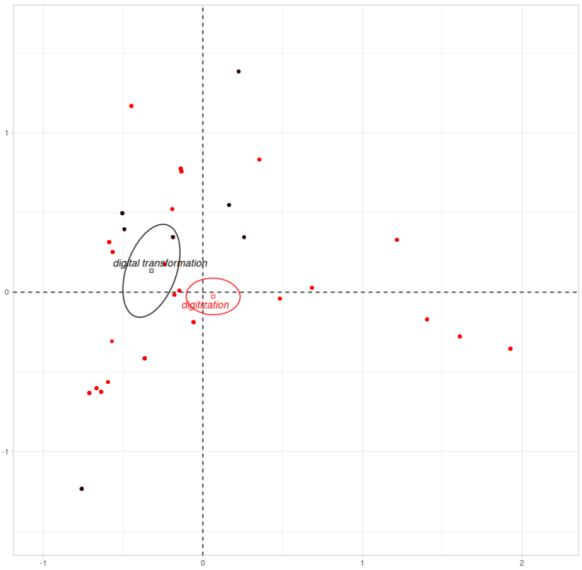


Figure 3. Structural homology and confidence ellipses
Source: own elaboration

Moreover, in support of the second hypothesis, the profile of the average bank mentioning digital transformation in its non-financial report is different from the global average profile of a bank in terms of structural, managerial, and institutional variables we used to construct the geometric space (see Table 1). We will discuss this point of difference in the concluding section of the paper.

Discussion, implications, limitations, and conclusion

To recapitulate, in this paper we have applied Geometric Data Analysis to construct and interpret the geometric space of Italian banks based on six variables and 26 respective modalities denoting different structural, managerial and institutional factors in which these are immersed. As is common in GDA, we have then reasoned in terms of structural homology and projected onto the space of Italian banks the mentions of digitalization and digital transformation in their respective non-financial reports. Two structural homologies were therefore revealed. The first one is a direct confirmation of the first hypothesis: digitalization is discussed most frequently by banks with the "global" (hence most typical) average profile of factors. Hence, the position of the respective category almost at the origin of the two most contributing dimensions. One might therefore conclude that digitalization is commonly addressed by banks with all kinds of factor profiles and there are no particular typology of banks whose characteristics are homologous to the mentions of digitalization in sustainability reporting.

This is not the case for the digital transformation category. In the first instance, the two categories are neatly separated (including their confidence ellipses). This already hints at the fundamental difference between the typology of banks that discuss digital transformation and digitalization in their reports. While, as mentioned above, digitalization is a common mention in heterogenous variety of banks, there is a clear preference in terms of which kind banks discuss digital transformation in their reporting. The results, therefore, confirm the second hypothesis as well. What precisely are the banks that engage more aptly in digital transformation narratives in their non-financial records. Given the position of the respective supplementary category (Figure 3) and given the interpretation of the two dimensions as given before we therefore conclude that: *Both larger, more complex institutions operating on international markets and banks that focus on equity/bond investments and interbank transactions rather than traditional branch-heavy retail are more likely to mention digital transformation in their non-financial reporting.*

From a managerial standpoint, these findings suggest that the terminology used in non-financial reporting is a reliable proxy for a bank's strategic maturity and organizational complexity. For executives at mid-sized or traditional retail banks, the tendency to stick to "digitalization" narratives may indicate a risk of strategic inertia, where technology is treated as an operational necessity rather than a transformative engine. To remain competitive against larger, internationalized peers, managers at these institutions should shift their focus toward the deeper structural changes typically associated with "digital transformation" rather than just digitizing existing retail workflows.

When it comes to strategic considerations, our results emphasize the necessity to shift from one- size-fits-all approaches with respect to technological adoption to more nuanced ways in which the "digital" theme is effectively addressed by banks. As a consequence, for upper management of large banking institutions that are, to a degree, internationalized, the strategic necessity must shift from ordinary tech acquisition to is more nuanced and creative strategic integration. The primary challenge, thus, consists in navigating the complexity of structural, managerial, and institutional factors, including those underlying interbank integrations and the respective variety of regulatory frameworks. On the other hand, for managers of local banks that are typically more retail-heavy, the objective implied by our results should be a successful narrative shift in now topic of digital is addressed and, hence, effectively tackled. Here, one should strive for proper differentiation in order to evade the pull of what we termed an "average" profile. As a result, rather than simply reporting on the effective deployment of additional digital initiative like conventional mobile apps and respective online portals, the managers of these institutions should strive toward more articulated value propositions that align more closely with digital transformation proper, as described in the paper. Such value propositions could include, for instance, AI-driven personalized wealth management and the related integration into platform-based ecosystems. By aligning their reporting language (and, hence, the actual strategy and operational activities) with the structural markers of digital transformation, these banks can signal a shift from strategic inertia toward organizational model that appeals to both investors and contemporary tech-savvy consumers.

To turn these (more abstract) insights into practical steps, bank executives could, for instance, implement a dual-track action plan. For instance, medium-sized and retail bank leaders could mandate a comprehensive audit of their current strategic roadmap. Tech projects could be explicitly categorized as either "operational digitization" (for instance, for standard app updates) or "digital transformation" (for instance, for core platform integrations). Moreover, the marketing and investor relations teams could intentionally reinforce their "digital" signalling in non-financial reports by means of concrete metrics that prove real banks' strategic integration. These, for instance, might include the active adoption of personalized AI financial planning tools, or measuring the percentage of revenue generated through platform ecosystem partnerships.

Our study is not without limitations. To begin with, because our empirical focus is on the unique institutional, regulatory, and regional landscape of Italy, the structural homologies mapped in the study reflect country-specific dynamics rather than universal banking behaviours. Hence, one should be careful in generalizing our results. From a methodological standpoint, GDA serves as a powerful, non-reductionist framework for spatial interpretation and mapping homologies within the Italian banking field, yet it remains primarily an exploratory and descriptive tool that, it is current form, does not capture causal linear relationships over time. Future research using

longitudinal datasets across diverse European regulatory environments will be essential to validate and extend the insights from this study.

To conclude, on a conceptual level, our research provides empirical evidence that digitalization and digital transformation are not merely synonyms but represent distinct structural positions in non-financial reports and, ideally, reified in organizational reality of banks. This hints at the likely hierarchy of digital maturity where transformation is reserved for banking institutions with high organizational complexity and international reach. We plan to explore this thesis in the future research on the topic.

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EXPLAINABLE DIGITAL UPSKILLING FOR LOCAL GOVERNMENT EMPLOYEES: A DIGCOMP 2.2, H5P AND SUPERVISED GENAI FRAMEWORK

Kounoupas, Nikos[1]; Dimotikalis, Yiannis[1]; Skiadas, Christos[2]

[1]Dept of Management Science & Technology, Hellenic Mediterranean University, Agios Nikolaos, Crete, Greece

[2]ISAST, Athens, Greece

Keywords: Digital Upskilling, Local Government, DigComp 2.2, H5P, Generative AI, Explainable Recommendations, Public Administration, KSA

Introduction and Aim

Digital transformation in local government is no longer limited to platform adoption or online service provision. It increasingly depends on employees' capacity to evaluate information, handle digital documents, communicate securely and solve non-routine administrative problems with reliable judgement. This study addresses a practical and methodological gap: digital-readiness assessments often identify competence deficits but offer limited explanation of how these deficits can become targeted learning responses. The aim is to develop an integrated framework that connects DigComp 2.2-based diagnosis with Knowledge-Skills-Attitudes (KSA) objectives, H5P activities and explainable recommendation logic. The study asks how heterogeneous readiness patterns among municipal employees can be translated into auditable, pedagogically justified upskilling pathways for high-accountability public administration.

Theoretical Background

The framework draws on public-administration research that treats digital transformation as an organisational and human-capability process, not merely a technological shift (Mergel, Edelmann and Haug, 2019). DigComp 2.2 provides the competence language for interpreting municipal evidence and translating it into knowledge, skills and attitudes (Vuorikari, Kluzer and Punie, 2022). H5P enables modular and interactive practice, linking specific subskills to concrete professional tasks rather than broad training themes (Sinnayah, Salcedo, and Rekhari, 2021). The recommendation layer draws on multicriteria decision analysis to structure transparent choices among learning activities (Greco, Ehrgott, and Figueira, 2016). It also incorporates explainable AI and human-in-the-loop principles, ensuring public-sector recommendations remain auditable, contestable and institutionally accountable (Zanzotto, 2019; Wieringa, 2020; Khosravi et al., 2022).

Methodology, Findings and Recommendation Logic

A convergent mixed-methods design was applied in eight Local Government Authorities in the Regional Unit of Heraklion, Crete (Creswell and Plano Clark, 2018). The quantitative strand used a 67-item questionnaire completed by 140 municipal employees; 57 DigComp 2.2-aligned items formed the modelling core for readiness analysis and KSA translation. The qualitative strand consisted of 13 semi-structured interviews analysed in ATLAS.ti through researcher-validated thematic coding. Principal Component Analysis, hierarchical clustering, K-means profiling, ANOVA and chi-square tests identified competence structures, archetypes and differentiating factors.

The findings indicate a differentiated readiness landscape rather than a uniform municipal skills deficit. ICT familiarity was the most consistent differentiator, while job role and income showed narrower effects in advanced or role-sensitive tasks. Five readiness archetypes were identified: Basic, Everyday, Connected, Analytical, and Advanced. Interview evidence clarified these profiles by revealing reduced confidence in non-routine tasks, reliance on colleagues or external support, and fragmented informal learning. These findings justify differentiated pathways: Basic users require scaffolded activities; Everyday users need routine autonomy; Connected users require collaborative, communication-centred tasks; Analytical users benefit from evaluative tasks; Advanced users can enter complex decision scenarios with limited scaffolding.

The diagnostic results were converted into an instructional architecture of 396 KSA-based learning objectives and 85 H5P activities. As shown in Figure 1, A.L.I.G.N.E.D. first supports semantic validation by normalising survey responses into controlled subskills, cross-referencing them with the validated KSA table and requiring automated or expert verification where ambiguity appears. DigiMatch-PA then receives the validated KSA coordinates, employee archetypes, PCA-derived thematic priorities and KSA-linked activity metadata, ranking activities through variance-derived priority, profile–objective fit and constrained fallback rules. For example, weak confidence in verifying digital documents is not assigned to a generic safety module; it is linked to document-authenticity knowledge, secure checking skills and an H5P activity on administrative validation.

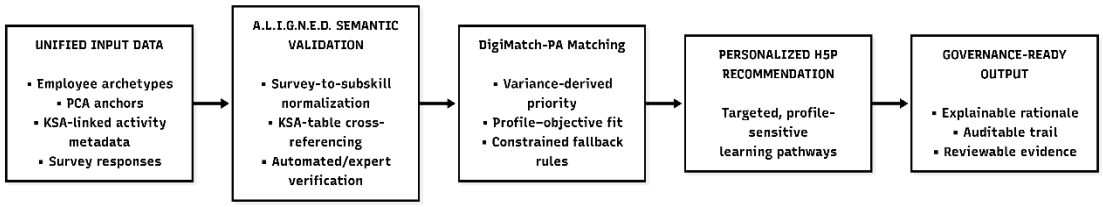


Figure 1: Traceable recommendation and validation flow.

Originality, Limitations and Implications

The originality of the study lies in extending digital competence assessment into an accountable diagnosis-to-intervention architecture. The framework does not simply classify employees; it produces recommendations whose rationale can be inspected by trainers, supervisors and institutional reviewers. Its implementation in the WordPress-based eduota.gr ecosystem indicates operational viability for annual training planning, profile-sensitive onboarding and targeted municipal upskilling; at employee level, the logic can generate prioritized roadmaps accompanied by pedagogical justification and traceable diagnostic evidence. Scalability is supported by DigComp 2.2, KSA metadata and modular H5P objects, although transfer to other public-administration contexts requires local validation of tasks, terminology and organisational constraints. Ethical safeguards include excluding socio-professional variables from recommendation generation, relying on competence-bearing evidence, constraining GenAI use and preserving human oversight. The main limitations are self-reported competence data, the regional focus on Heraklion and the absence of longitudinal evidence on learning gains or workplace transfer. Future research should combine performance-based assessment, workflow analytics, multi-region validation and longitudinal pilot evaluations to examine competence development, pathway effectiveness and workplace transfer over time.

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A MULTI-SECTOR FRAMEWORK LINKING CYBERSECURITY WORKFORCE CAPABILITY TO CRITICAL INFRASTRUCTURE RESILIENCE

Aihie Osarenkhoe[1], Samuel-Noah Osarenkhoe[2], Peter Ek[3], Ehsanul Chowdhury[4], Asif Huq[5]

[1,3,4,5]Department of Business & Economic Studies, University of Gävle, Gävle, Sweden.
[2]Global Partners LP, Waltham, MA, USA.

Keywords: AI-human dynamics; Cybersecurity Workforce Shortage; Critical Infrastructure; Information Technology (IT); Operational Technology (OT); PRISMA; Systematic Literature Review; Multi-Sector Case Study

Purpose: *This study investigates how cybersecurity workforce shortages affect the resilience of critical digital infrastructure, with a focus on the energy sector and comparative insights from finance, transportation, and telecommunications. It reframes the skills gap as a systemic risk that limits organizational capacity to prevent, respond to, and recover from cyber threats.* ***Design/methodology/approach:*** *A two-phase qualitative methodology was used. A PRISMA-guided systematic literature review (n = 70 studies) identified thematic gaps, followed by multi-sector case studies (n = 5) based on 22 semi-structured interviews and documentary analysis. Socio-technical systems theory informed the analytical lens.* ***Findings:*** *Findings show that even where technical controls exist, resilience is undermined by a lack of hybrid-skilled professionals capable of bridging information technology (IT), operational technology (OT), artificial intelligence (AI), and regulatory domains. Case studies revealed how skills shortages delay containment, impede risk communication, and fragment coordination across departments.* ***Conclusion:*** *Cybersecurity workforce capability is a foundational pillar of infrastructure resilience. Sector-specific knowledge, cross-disciplinary collaboration, and continuous upskilling are essential for managing complex, evolving threats.* ***Practical implications:*** *Organizations must invest in developing hybrid roles, aligning training with sector demands, and embedding cybersecurity into operational practices.* ***Policy/social implications****: Policymakers should support cross-sector training incentives, mental health resources, and educational reforms to enhance national workforce resilience.* ***Theoretical implications****: The study presents a socio-technical conceptual framework positioning workforce capability as central to cybersecurity resilience, offering a basis for future research.* ***Limitations of the study****: Limited case samples and qualitative methods constrain generalizability. Future research should explore global variations and AI-human dynamics in cybersecurity. Originality/value: This research offers a novel, cross-sector model of the cybersecurity workforce gap as a core resilience factor, advancing both theory and practice.*

Introduction

Across Europe, the same troubling trend continues to emerge. Healthcare organisations are hit by ransomware incidents that expose sensitive patient information (Katsuya & Liu, 2025; Digital4Business, 2026). Banks and other financial institutions suffer heavy losses due to advanced phishing schemes. Meanwhile, critical infrastructure is targeted by coordinated cyberattacks that interrupt vital services. These situations are not theoretical - they reflect the everyday challenges organisations face in a progressively more dangerous digital landscape (*ibid*).

Cyber incidents are now a daily operational risk. The real question for organisations isn't *if* an incident will happen - it's whether they have the people to prevent, detect and respond effectively. The *ISC² Cybersecurity Workforce Study 2025* highlights a stark reality behind these issues: worldwide, there is a need for roughly 4 million more cybersecurity professionals to effectively counter current threats ((ISC)², 2025). Europe makes up a significant share of this shortfall, and despite growing investment in cybersecurity training and education, the gap continues to expand rather than shrink (*ibid*).

The rapid digitisation of critical infrastructure sectors—including energy, finance, transportation, and telecommunications (Allen et al., 2023; Duska, 2025)—has increased reliance on complex, interconnected cyber-physical systems (Malatji et al., 2022; Lawelai et al., 2025). While improving efficiency, this transformation simultaneously expands the cyber threat landscape (Thomas & Sule, 2023). Incidents such as ransomware, supply chain compromises, and adversarial AI attacks expose systemic vulnerabilities that threaten national security, economic stability, and public trust (Kandpal et al., 2025; Kour & Karim, 2021).

A key tension lies in modernizing infrastructure while securing legacy operational technologies (OT) integrated with contemporary information technologies (IT) (Malatji et al., 2022). This IT/OT convergence amplifies systemic risk, extending beyond financial loss to threats against public safety, environmental integrity, and national sovereignty (Graham, 2025; Al-Hawamleh, 2024). Despite increasing awareness, organizational responses remain constrained by structural and capacity limitations.

A primary constraint is the persistent shortage of cybersecurity professionals (Stavrou & Piki, 2024). Demand is projected to grow by 30% over the next decade (U.S. Bureau of Labor Statistics, 2023), yet the talent pipeline remains insufficient. This gap is intensified by the complexity of emerging technologies—AI, industrial IoT, and blockchain—which require advanced technical and interdisciplinary expertise (Spruit, 2022; Stavrou & Piki, 2024). As such, workforce shortages represent a systemic limitation on cybersecurity capability rather than a mere staffing issue.

Within supply chains, Orji and U-Dominic (2024) emphasize the importance of cyber-risk management in third-party logistics providers (3PLs) for social sustainability. However, persistent implementation challenges continue to undermine cybersecurity maturity in these environments, exposing vulnerabilities in supply chain resilience.

Problematisation and Research Gap

Evidence from the energy sector shows that incidents such as vendor account breaches and cross-site attacks highlight the need for integrated, cross-functional cybersecurity expertise. As Haney and Lutters (2021) argue, effective cybersecurity depends on bridging technical, organizational, and strategic domains; technological solutions alone are insufficient without skilled professionals who can align them with operational contexts.

This challenge is intensified in legacy-dependent systems undergoing IT/OT convergence (Malatji et al., 2022). Advanced security solutions require practitioners capable of adapting and sustaining them within complex, regulated infrastructures (Thomas & Sule, 2023), while workforce capacity and well-being remain critical for long-term resilience (Graham, 2025; Singh et al., 2023).

Although technical solutions are well studied (Duska, 2025; Allen et al., 2023), the human dimension—particularly how workforce shortages constrain cybersecurity practice—remains underexplored (Khaw et al., 2024). Existing research acknowledges skills gaps but provides limited empirical insight into their operational impact.

A PRISMA-based review identifies a critical intersection between workforce capability, sector-specific demands, and cybersecurity implementation in high-risk contexts (Malatji et al., 2022; Thomas & Sule, 2023; Bechara & Schuch, 2021). While standards exist, their practical effectiveness under conditions of skills scarcity is poorly understood.

Adopting a Socio-Technical Systems (STS) perspective, this study conceptualizes cybersecurity as the interaction of people, processes, technologies, and environments. Evidence from healthcare (Katsuya & Liu, 2025), finance (Kandpal et al., 2025), and e-government (Al-Hawamleh, 2024) indicates that skills gaps erode resilience, yet cross-sector comparisons remain limited.

Research Question (RQ)
How does the cybersecurity skills gap influence the effectiveness and resilience of cybersecurity practices within the energy sector's digital infrastructure?

This study frames workforce shortages as systemic disruptions that misalign socio-technical elements, constraining the ability of critical infrastructure sectors to sustain adaptive and resilient cybersecurity practices.

Research objectives:

1. Synthesize literature on cybersecurity workforce gaps and their impact on infrastructure resilience using a PRISMA approach.
2. Examine how workforce shortages affect cybersecurity practices in energy, transportation, telecommunication and finance, focusing on socio-technical barriers.
3. Develop a socio-technical framework linking workforce capability to infrastructure resilience.

As shown in Table 1, prior research emphasises frameworks and technical tools (Malatji et al., 2022; Khaw et al., 2024; Duska, 2025; Allen et al., 2023) but largely overlooks how workforce gaps disrupt operational cybersecurity. This study addresses this gap through cross-sector empirical evidence.

By integrating technical, organisational and human dimensions, the study responds to calls for interdisciplinary approaches (Spruit, 2022; Singh et al., 2023) and reframes the workforce gap as a resilience issue, highlighting the importance of hybrid professionals. Overall, the findings demonstrate that workforce capability is a foundational element of cybersecurity resilience in critical infrastructure.

ASPECT	DETAILS
Research Gap Filled	- Addresses the lack of empirical research on how workforce shortages disrupt cybersecurity operations in critical infrastructure (Bowen et al., 2006; Khaw et al., 2024; Singh et al., 2023). - Fills the void in cross-sectoral analysis of hybrid skill needs and operational resilience (Graham, 2025; Stavrou & Piki, 2024). - Extends beyond existing literature that focuses on technical tools or generic workforce metrics by integrating sector-specific, operational, and human factors (Duska, 2025; Allen et al., 2023).

	- Responds to calls for context-aware, interdisciplinary approaches to cybersecurity capability (Malatji et al., 2022; Spruit, 2022; Xenakis et al., 2025).
Contribution	- Reframes the cybersecurity workforce gap as a socio-technical resilience issue, not just a staffing problem (Malatji et al., 2022; Khaw et al., 2024). - Develops a conceptual framework grounded in socio-technical systems (STS) theory to illustrate how workforce capability underpins infrastructure resilience (Bechara & Schuch, 2021; Whitworth, 2009; Orji & U-Dominic, 2025). - Provides empirical evidence from five critical sectors (energy, transport, finance, telecom) showing how hybrid skill shortages disrupt incident response and operational continuity (Thomas & Sule, 2023; Singh et al., 2023). - Offers policy-relevant insights through a causal impact pathway linking workforce shortages to systemic vulnerabilities (Spruit, 2022; Knapp & Wong, 2020).

Table 1: A Synopsis of Contributions and Gaps Filled in this Study

Theoretical Background and Literature Review

Socio-Technical Systems (STS) Theory

Socio-technical systems (STS) theory offers a valuable framework for understanding how human and technical components interact within cybersecurity environments. Originating from Trist and Emery and later advanced by Mumford (2006) and Baxter and Sommerville (2011), STS views organisations as interconnected social and technical subsystems influenced by broader contextual conditions. In cybersecurity, this perspective is essential because security outcomes emerge from the interplay between people, technologies, processes and organisational structures.

The principle of joint optimisation argues that neither technical controls nor human capabilities alone can ensure security. Overreliance on technology creates socio-technical gaps and systemic vulnerabilities if organisational practices do not evolve alongside technological measures (Whitworth, 2009). STS also reframes workforce shortages as a systemic challenge rather than a simple labour-market issue. Effective cybersecurity capability depends on alignment between skilled staff, organisational readiness, technological infrastructure and regulatory environments. Critical sectors such as energy, finance and transportation rely on this alignment to respond to increasingly sophisticated cyber threats. As a result, cybersecurity professionals require both technical skills and cross-functional abilities to integrate security into mission-critical operations (Malaji et al., 2019; Khaw et al., 2024; Schreiber & Schreiber, 2025).

Relevance of STS to This Study

This study adopts an STS perspective to investigate how cybersecurity workforce shortages affect infrastructure resilience. The approach is particularly relevant in environments such as the energy sector, where legacy technologies, strict regulation and emerging digital systems converge. STS supports analysis of how personnel shortages disrupt not only technical functions but also the broader socio-technical configuration required to maintain resilient cybersecurity performance.

Literature Review

Table 2 is derived from a structured, iterative research approach designed to move beyond surface-level observations and uncover how cybersecurity workforce shortages affect resilience across energy, transportation, telecommunications, and financial infrastructures. By integrating findings from a Systematic Literature Review (SLR) with insights from empirical multi-sector case studies, the table synthesizes diverse perspectives on workforce capabilities. This

combined approach enables a context-sensitive understanding of how staffing gaps, skill mismatches, and organizational structures shape cybersecurity outcomes, providing a comprehensive foundation for the patterns and viewpoints presented in Table 2.

Extant Literature	**Main Focus**	**Key Findings**
Malatji et al. (2022), Cybersecurity capabilities for critical infrastructure resilience	Capability frameworks for critical infrastructure	Identify 29 domains adapted from NIST but notes skills shortage
Khaw et al. (2024), Systematic review of cybersecurity frameworks	Cybersecurity capability pillars	Highlight individual, organizational, technological, governmental capability
Haney & Lutters (2021), Cybersecurity advocates in practice	Human factors in cybersecurity	Importance of advocates with communication skills
Thomas & Sule (2023), Service lens on cybersecurity continuity	Service-based approaches	Link resilience to continuity management
Graham (2025), AI in cybersecurity workforce	AI skills in cybersecurity	AI integration requires new workforce competencies
Kour & Karim (2021), Railway cybersecurity maturity	Cybersecurity maturity in transport	Workforce maturity is critical to protecting transport systems
Otoom et al. (2025), EduCERT framework	Cybersecurity education ecosystems	Collaborative higher education models to build workforce skills
Bechara & Schuch (2021), Global frameworks for cybersecurity resilience	Global policy frameworks	Need for local skills to implement international standards
Yeboah-Ofori & Opoku-Boateng (2023), Cybercrime in evolving environments	Cybercrime frameworks	Skills needed to manage evolving energy cybercrime risk
Lawelai et al. (2025), Smart city cybersecurity policy	Cybersecurity in smart cities	Challenge in policy and skills alignment
Mwogosi & Simba (2025), Health EHR cybersecurity	Health sector cybersecurity	Electronic health records have parallel skills gaps
Singh et al. (2023), Cybersecurity workforce stress	Workforce well-being	High stress impacts retention and resilience
Bowen et al. (2006), NIST 2017a&b	Managerial cybersecurity controls	Management support essential for workforce effectiveness
Anderson & Moore (2007), Economics of information security	Economics of cybersecurity	Incentives and costs shape workforce development
Chen & Zahedi (2016), Security perceptions and behavior	Human perceptions	Perceptions of security influence adoption of practices

Spruit (2022), Competence frameworks in cybersecurity	Cybersecurity education	Proposes standardized frameworks to harmonize skills and reduce stress
Lnenicka et al. (2025), Cybersecurity in smart cities	Smart infrastructure security	Highlights governance and cross-sector collaboration
Xenakis et al. (2025), Addressing cybersecurity literacy	Workforce literacy programs	Recommends policy for critical infrastructure literacy skills
Stavrou & Piki (2024), Lifelong learning for cybersecurity skills	Continuous learning	Emphasizes upskilling and workforce adaptability
Kandpal et al. (2025), Cybersecurity in digital finance	Financial sector security	Underscores privacy and workforce skills gaps in fintech environments
Younies & Al-Tawil (2020), *Effect of cybercrime laws in UAE*	Cyber legislation and operational readiness	Shows that legal frameworks require skilled enforcement personnel to be effective.
Radanliev et al. (2020), *Artificial intelligence in cybersecurity*	AI-driven cybersecurity challenges	Finds emerging AI skills are essential but significantly lacking in current workforce profiles.
Rangarajan et al. (2025), *A roadmap to address burnout in cybersecurity profession*	Workforce well-being	Offers multidimensional strategies to combat burnout and retain talent.
Tallam (2025), *The Cyber Immune System*	Adaptive cyber defense & resilience	Proposes adversarial testing as a mechanism to reinforce resilience—underscoring new skill paradigms.
Walendy et al. (2024), *Curriculum initiative for hardware reverse engineering (HRE)*	Hardware supply chain security	Advocates integrating HRE education into cybersecurity curriculums to secure infrastructure.
Alevizos (2025), *Complexity-informed cyber defenses*	Organizational complexity and defense optimization	Introduces a model linking workforce planning and analytics to reduce defense complexity.

Table 2. Summary of Key Literature Insights

Resilience and the Cybersecurity Skills Gap

Resilience in critical digital infrastructure is increasingly constrained by a persistent global shortage of cybersecurity professionals ((ISC)², 2025; Digital4Business, 2026). This skills gap constitutes a systemic risk rather than a purely technical deficit (Malatji et al., 2022; Lawelai et al., 2025). Modern cybersecurity involves managerial, behavioural and economic considerations alongside technical controls (Knapp & Wong, 2020; Thomas et al., 2023; Kandpal et al., 2025). Standards such as NIST (2017a) emphasise management controls, continuous updates and staff awareness (Bowen et al., 2006; Al-Hawamleh, 2024). Human perceptions and behaviour significantly shape cybersecurity performance (Katsuya & Liu, 2025), and workforce shortages limit the implementation of these frameworks, particularly in regulated, high-risk sectors like energy (Xenakis et al., 2025).

Cybersecurity Workforce Capability

Workforce capability is a key determinant of cyber resilience. Malatji et al. (2022) identify 29 cybersecurity domains—spanning cloud, IoT, industrial control and operational technologies—derived from NIST, yet significant gaps remain in practical application (Orji & U-Dominic, 2025). Khaw et al. (2024) conceptualise capability as a multi-layer ecosystem involving individual skills, organisational culture, technological readiness and governmental support. Educational collaborations such as EduCERT strengthen cross-sector skill exchange (Otoom et al., 2025). Organisational culture remains central to effective cybersecurity yet is frequently underdeveloped (Kritzinger & Von Solms, 2010). Research also highlights the need for cybersecurity advocates with strong communication and persuasion skills (Haney & Lutters, 2021; Lawelai et al., 2025), competences often neglected in technical training. Continuous learning is vital due to the rapidly evolving nature of cyber threats (Asbaş & Tuzlukaya, 2022; Khaw et al., 2024), while economic incentives support workforce retention (Pipyros & Liasidou, 2025; Knapp & Wong, 2025).

Sector-Specific Cybersecurity Needs

Sector-specific contexts shape cybersecurity demands. In the energy sector, integration of SCADA, DCS, ICS and IoT increases system complexity and vulnerability (Malatji et al., 2022; Al-Hawamleh, 2024). Addressing these challenges requires combining technical expertise with compliance, safety and risk management skills (Thomas & Sule, 2023). Multi-vendor ecosystems require knowledge of interoperability and supplier relationships (Yeboah-Ofori & Opoku-Boateng, 2023).

Other sectors face parallel challenges: healthcare systems encounter vulnerabilities in electronic health records (Mwogosi & Simba, 2025); financial institutions face compliance risks linked to staff turnover (Kandpal et al., 2025); transportation systems depend heavily on staff awareness (Kour & Karim, 2021); and e-government suffers from delays caused by skills shortages (Al-Hawamleh, 2024). Cultural factors—including trust, user beliefs and managerial support—also influence cybersecurity outcomes (Orji & U-Dominic, 2024; Chen & Redar, 2014).

Operationalising Cybersecurity in High-Risk Sectors

High-risk sectors often struggle to operationalise cybersecurity frameworks. Workforce shortages hinder consistent implementation of standards (Thomas & Sule, 2023), while legacy systems obstruct compliance (Malatji et al., 2022). Supply-chain cybersecurity highlights the need for cross-organisational coordination (Orji & U-Dominic, 2024; Friday et al., 2024). Global frameworks achieve effectiveness only when adapted to local contexts by skilled personnel (Bechara & Schuch, 2021). Behavioural factors such as user perception further influence security effectiveness (Chen & Zahedi, 2016).

Emerging Themes: AI, Cyber-Physical Systems and Workforce Stress

AI-enabled cybersecurity expands workforce requirements into areas such as machine learning and data ethics (Graham, 2025). Industry 4.0 strengthens the need for hybrid engineering-security expertise (Haleem et al., 2022). Smart grids and other cyber-physical systems amplify vulnerabilities and require ongoing skill development (Lnenicka et al., 2025; Katsuya & Liu, 2025).

Workforce stress is an emerging vulnerability. High-pressure work environments contribute to burnout and attrition (Singh et al., 2023). Standardised frameworks such as the European e-Competence Framework help clarify roles and reduce overload (Spruit, 2022). Mental-health

and organisational support mechanisms are essential for sustaining capacity (Lawelai et al., 2025; Katsuya & Liu, 2025).

Malatji et al. (2022) and Khaw et al. (2024) propose comprehensive frameworks outlining the multi-domain skills needed to address evolving cybersecurity challenges, emphasising both technical breadth and systemic capability. Human-centred dimensions also remain critical: Haney and Lutters (2021) highlight the importance of soft skills and communication, while Graham (2025) and Stavrou and Piki (2024) draw attention to competencies related to artificial intelligence and lifelong learning as digital environments rapidly transform.

Sector-specific studies reinforce that workforce needs differ across operational contexts. Kour and Karim (2021) show that cybersecurity gaps in the railway sector stem from its unique safety-critical infrastructure, whereas Mwogosi and Simba (2025) identify healthcare vulnerabilities tied to clinical workflows and patient-centric technologies. These studies challenge generic workforce models and support tailored development strategies. Similarly, Lawelai et al. (2025) and Lnenicka et al. (2025) examine smart cities, showing how governance and policy must align with emerging skills demands.

Psychological well-being also influences workforce sustainability. Singh et al. (2023) and Spruit (2022) demonstrate that retention, stress management and organisational culture are integral to resilience, extending the skills debate beyond technical expertise.

Policy and governance remain central enablers. Bowen et al. (2006) and Bechara and Schuch (2021) argue that international frameworks and managerial practices succeed only when implemented by capable, well-supported personnel. Anderson and Moore (2007) add that economic incentives and cost structures shape recruitment and retention.

Collectively, the literature shows that closing cybersecurity workforce gaps requires a holistic strategy spanning technical skills, sector-specific expertise, organisational well-being and supportive policy infrastructure.

Synthesis of Literature and Research Gaps

Evidence across energy, health, finance and transportation sectors confirms that workforce capability is fundamental to resilience; however, capability remains unevenly developed. Industry 4.0, IT/OT convergence and AI adoption intensify demand for specialised skills, yet outdated training models and fragmented pipelines impede development. Psychological strain further increases burnout and attrition risks, while policy frameworks remain insufficient without skilled personnel to implement them.

Sectoral variation also prevents universal solutions: energy organisations rely on long-life-cycle control systems; finance faces high turnover; healthcare must balance security with patient care. Supply chain risks compound these issues, especially where organisations outsource IT but lack in-house expertise. Finally, empirical research is limited on how workforce shortages disrupt daily cybersecurity tasks.

Methodology

Research Approach and Strategy

This study adopts a structured, iterative approach to move beyond surface-level observations and uncover how cybersecurity workforce shortages affect resilience in energy, transportation, telecommunication and financial infrastructure. By integrating a Systematic Literature Review

(SLR) with empirical case studies, the research develops a context-sensitive understanding of how staffing gaps, skill mismatches, and organizational structures influence cybersecurity outcomes. A multi-method qualitative design was used in two phases: an SLR to identify knowledge gaps, followed by empirical fieldwork involving semi-structured interviews and documentary analysis to build detailed case studies.

Systematic Literature Review

A systematic literature review was conducted to map academic discourse on cybersecurity workforce shortages and their operational impacts, following the PRISMA framework to ensure transparency and replicability.

Search Strategy and Inclusion Criteria

Databases searched included Scopus, IEEE Xplore, SpringerLink, and Emerald Insight. Eligible articles (2015–2025, English) addressed:

- Cybersecurity workforce challenges in operational contexts
- Skill shortages or hybrid skills (e.g., IT/OT, AI/ML security)
- Cyber resilience or incident response in digital infrastructure

Conceptual papers without empirical data, non-workforce-focused studies, and duplicates were excluded.

Screening and Synthesis

A three-stage screening process (title/abstract, full-text, and bias appraisal using adapted CASP criteria) ensured methodological rigor. Seventy articles were retained. Three key patterns emerged:

- Workforce shortages delay incident detection and response
- Demand for hybrid skills is increasing
- Limited empirical research on frontline operational disruption

These findings informed the fieldwork phase.

Qualitative Fieldwork and Case Study Design

A multiple case study approach examined socio-technical challenges across sectors. Data were collected through 22 semi-structured interviews and organizational documents related to cybersecurity incidents in energy, transportation, and finance.

Data Collection: Interview Protocol

Interviews were conducted over eight weeks with cybersecurity professionals, engineers, and managers. Each lasted ~60 minutes and was held virtually or in person. Topics included roles, sector challenges, staffing gaps, incident responses, and organizational barriers.

Example questions:

1. Describe your role
2. What challenges do you face?
3. How do staff shortages affect your work?
4. Describe recent incidents and responses
5. What skills are missing?

Interviews were recorded, transcribed, anonymized, and member checked. Documents and field notes supported triangulation.

Ethics and Consent
Ethical clearance was obtained. Participants received information sheets and signed consent forms outlining confidentiality, voluntary participation, data use, and withdrawal rights.

Data Analysis
Data were analyzed using a grounded theory-inspired inductive approach to identify patterns linking workforce challenges, sector contexts, and incident response.

Coding process
Open coding identified concepts such as burnout, role confusion, and lack of authority. Axial coding refined these into four themes:
• Workforce shortages and burnout
• Skill gaps and hybrid capability needs
• Organizational silos and coordination issues
• Cultural and regulatory influences
For example, unclear authority and siloed teams were grouped under coordination breakdowns. NVivo supported coding consistency and synthesis.

Cross-Case Comparison
Cross-case analysis revealed both shared and sector-specific dynamics:
• Energy: fear of service disruption (e.g., outages)
• Transportation: passenger safety concerns
• Finance: reputational and regulatory pressures
All sectors faced shortages of cross-disciplinary talent, limiting effective incident response.

Validation Strategies: Analytic trustworthiness was ensured through member checking and independent review of coding by two researchers. Discrepancies were resolved collaboratively to enhance credibility

Empirical Findings Based on Multi-Sector Case Studies
This section presents five case studies from the energy, transportation, financial and telecommunications sectors, based on interview and documentary data. The cases illustrate how cybersecurity workforce shortages hinder incident response, weaken coordination and undermine systemic resilience. Each case is analysed through a socio-technical systems lens, with pseudonyms used where appropriate. A summary of the cases is provided in Table 3, followed by detailed descriptions of each individual case.

Organization/ Sector	Incident	Frontline Perspectives	Key Implications
Energy Regional energy utility (Midwest)	Vendor credentials compromised via phishing, lateral movement into AMI/SCADA systems	Staff described being "frozen" by uncertainty; only one hybrid OT/IT expert available; field technicians afraid to act without guidance	Robust architectures ineffective without skilled cross-domain staff to coordinate incident response and avoid cascading failures
Energy "EnergyCo" (anonymized)	Malware on contractor laptop through trusted VPN, threatened dispatch scheduling	Dispatch staff torn between keeping fuel flowing and following cybersecurity instructions; confusion on escalation	Technical safeguards could not be activated under stress due to lack of hybrid cybersecurity skills and coordination bottlenecks

Transportation Metropolitan transportation authority	Vulnerability in SaaS–ICS API delayed patching for 3 months	Engineering staff felt unsupported; cybersecurity staff feared breaking safety protocols; legacy/modern teams failed to collaborate	Without cybersecurity staff trained in secure software and transportation systems, even simple vulnerabilities remain unaddressed
Finance Large financial institution	Third-party API exploited to inject adversarial data, disrupting ML fraud detection	Fraud analysts powerless to override models; cybersecurity staff lacked data science skills; delays relying on consultants	Advanced ecosystems need cybersecurity staff fluent in data science; skills shortages leave critical services vulnerable
Telecommunication National telecom provider	Phishing, ransomware, and DDoS attacks disrupted services; API misconfiguration exploited via third-party billing system	Engineers overwhelmed by alert overload; analysts lacked visibility; vendor security unknown; leadership delayed escalation	Telecom resilience depends on real-time, integrated visibility and hybrid-skilled teams across IT, OT, and vendor domains

Table 3: Summary of Case Studies

Presentation of the Five Case Studies

Case Study 1: Third-Party Vendor Compromise in a Regional Energy Utility

A regional energy utility integrating Advanced Metering Infrastructure (AMI) with legacy SCADA systems relied on a third-party IoT vendor whose technicians had persistent VPN access to critical infrastructure. When a technician's credentials were stolen through phishing, an attacker leveraged the vendor's VPN to move laterally into the utility's networks. Although segmentation detected irregular SCADA queries, the threat took nearly two days to contain, during which multiple systems were probed.

Interviews revealed severe coordination and skill deficits. Engineers feared that taking decisive action could trigger unintended power disruptions, while analysts struggled to differentiate legitimate vendor activity from malicious behavior. Only one employee had experience bridging SCADA protocols and IT cybersecurity tools - an acute skills shortage that amplified the breach's impact.

This case demonstrates how reliance on third-party access, combined with insufficient hybrid IT/OT expertise, undermines resilience. It aligns with Lawelai et al. (2025), who argue that digitally modernized utilities require professionals capable of understanding converged systems to manage complex cyber disruptions.

Case Study 2: Malware Containment Challenges at "EnergyCo"

"EnergyCo," an independent fuel distributor, migrated its dispatch systems to a hybrid cloud to enhance real-time logistics coordination. A contractor inadvertently connected a malware-infected personal laptop during a remote session, allowing the malware to spread into dispatch subnets before anomaly detection tools intervened. Containment was complicated by the operational risk of disconnecting terminals during peak demand.

Interviews indicated decision paralysis and limited staffing. A single cloud specialist worked over 24 hours without relief, while dispatch personnel hesitated to isolate terminals, fearing service disruptions. Analysts delayed escalation due to ambiguous authority and unclear network responsibilities. As one contractor noted, "A contractor reported, "*I didn't know who had authority -everyone froze*."

Even low-complexity malware triggered a near-crisis because the organisation lacked redundancy, clarity of roles, and cross-trained personnel. This supports Thomas & Sule (2023), who argue that resilience frameworks demand staff who can combine technical skill with domain-specific operational judgment.

Case Study 3: Vulnerability Management in a Metropolitan Transportation Authority.
A metropolitan transportation authority modernized its signaling through a communications-based train control (CBTC) and integrated third-party predictive maintenance tools via cloud-hosted APIs. A critical API vulnerability was identified during an audit, enabling potential command injection into train systems. Despite the severity, patching took more than three months due to a shortage of personnel versed in both secure software development and rail system operations.

Interviews highlighted organizational fragmentation. SOC analysts hesitated to intervene for fear of disrupting safety systems. Rail engineers distrusted cybersecurity staff, believing they lacked operational understanding. As one engineer put it, "*They approached this like patching a website, not a transit system*." Burnout was widespread, with employees juggling day-to-day incidents alongside this high-stakes vulnerability.
The case illustrates how socio-technical misalignment - rather than purely technical failure - prolongs risk exposure. Echoing Friday et al. (2024), the findings show that resilience in critical infrastructure depends on cross-functional collaboration and shared mental models, not solely advanced tools.

Case Study 4: Adversarial Machine Learning Attack in a Financial Institution
A major bank deployed a machine learning-based fraud detection engine integrated with fintech partners via APIs. Attackers exploited a misconfigured partner API key to inject adversarial data into the model, generating a massive spike in false positives that froze thousands of legitimate transactions and triggered public backlash.

Interviews revealed confusion and lack of interdisciplinary fluency. Fraud analysts could not interpret or override ML decisions; cybersecurity teams lacked expertise in adversarial AI techniques; and data scientists struggled to communicate model mechanics to incident responders. As one participant stated, "*They thought in firewalls, we thought in tensors*." External consultants arrived only after 36 hours.

The incident underscores the need for hybrid AI-cybersecurity skill sets. Consistent with Kandpal et al. (2025), the case demonstrates that AI-enabled financial systems require professionals capable of securing and interpreting machine learning models to maintain operational resilience.

Case Study 5: Multi-Vector Cyberattacks in a National Telecom Provider
A national telecom provider undergoing 5G-related digital transformation experienced a coordinated two-week series of cyberattacks - phishing, ransomware, and DDoS. A compromised billing administrator account enabled lateral movement into customer databases. Concurrently, ransomware entered through a misconfigured third-party API, and a large-scale DDoS attack disabled mobile data across multiple cities.

Interviews revealed severe coordination failures. SOC analysts could not correlate the attacks across systems. "*Everything was on fire*," a network engineer recalled, describing simultaneous

failures across email, routing, and billing platforms. Executive hesitation—driven partly by regulatory fear—delayed full incident mobilisation. Vendor visibility was limited, with one executive admitting, "*The billing platform was a black box*."

Despite heavy ICT investments, staffing shortages, siloed teams, and fragmented monitoring left the organisation vulnerable to multi-vector exploitation. The case reflects Malik & Ncube's (2025) argument that resilience in telecoms depends on socio-technical integration, unified governance, and continuous organisational learning.

Addendum: Practitioner Insights from the Energy Sector

A focused group interview with energy practitioners reinforced findings from the case studies. Participants described recent incidents - particularly vendor account compromises and cross-site attacks - as evidence of structural vulnerabilities. One noted, "*These aren't just technical failures - they show how disconnected our technical defenses are from the rest of the organization*."
Practitioners stressed the need for cross-functional capability. One participant argued, "*We need people who understand both the tech and the business - who can translate risks into action across departments*," echoing Haney and Lutters' (2021) emphasis on cybersecurity advocates who bridge cultural and operational divides. Another noted, "*You can have the best tools, but if teams can't align them with operations, you're still vulnerable*." Their reflections highlight that resilience depends not only on robust technology but on people, processes, and organisational purpose.

Discussion of Findings and Cross-Case Synthesis

This discussion interprets the five case studies through socio-technical systems theory, integrating evidence from the energy, transportation, finance and telecommunications sectors. It examines how cybersecurity workforce challenges manifest in practice, how they vary across sectors, and what they imply for resilience in critical infrastructure. Four themes structure the analysis: (1) cybersecurity workforce capability; (2) sector-specific needs, with emphasis on energy; (3) operationalization of cybersecurity in high-risk environments; and (4) implications of the skills gap for resilience. These themes align with patterns found in the 70 studies reviewed during the SLR.

Cybersecurity Workforce Capability in Critical Infrastructure
Across all cases, workforce capability emerged as the most decisive factor shaping cybersecurity resilience. Organizations had invested in detection and response tools, but these systems frequently underperformed because staff lacked the expertise to interpret alerts or make time-critical decisions. This reinforces arguments by Malatji et al. (2022), Khaw et al. (2024) and Otoom et al. (2025) that cybersecurity frameworks succeed only when implemented by sufficiently skilled personnel.

A central finding is the scarcity of hybrid-skilled professionals who understand both cybersecurity and sector-specific operational systems. In Case 1, engineers hesitated to isolate compromised SCADA components due to concerns about triggering outages. In Case 4, fraud analysts and cybersecurity teams lacked the interdisciplinary fluency needed to recognise and respond to adversarial machine-learning attacks. These patterns align with Spruit (2022) and Xenakis et al. (2025), who conceptualize cybersecurity as a socio-technical capacity dependent on cross-domain literacy.

Hybrid capability also involves non-technical competencies—communication, risk translation and interdepartmental coordination. Anderson & Moore (2007) and Krishna et al. (2025) argue that many cybersecurity failures stem from institutional mistrust and communication breakdowns rather than technological shortcomings. The cases affirm this: teams delayed action not because tools failed but because roles, authority and expertise were unclear.

Sector-Specific Cybersecurity Needs: Emphasis on Energy

The energy sector illustrates the most acute workforce demands due to its reliance on legacy OT, expanding IT connectivity and a highly conservative regulatory environment. In Cases 1 and 2, cybersecurity action was slowed by concerns about disrupting electricity distribution or fuel logistics. Cybersecurity teams lacked the sector-specific knowledge needed to contextualize risks, while operational leaders sometimes deprioritised cybersecurity for continuity reasons.

These findings echo Thomas & Sule (2023) and Haleem et al. (2022), who highlight the need for cybersecurity strategies that incorporate the real-time, safety-critical nature of industrial processes. They also align with Malatji et al.'s (2022) observation that energy organisations face persistent gaps in hybridized IT/OT capability.

Third-party reliance compounds these challenges. Both Case 1 and Case 2 were triggered by vendor-related access paths - credential compromise and malware infection. Yeboah-Ofori & Opoku-Boateng (2023) and Friday et al. (2024) similarly describe how distributed vendor ecosystems introduce opaque risks that overstretch internal teams.

Regulatory culture further complicates action. High thresholds for intervention - designed to prevent service disruption—often slow cybersecurity responses when hybrid expertise is absent. Comparable findings in healthcare (Mwogosi & Simba, 2025) and smart cities (Lawelai et al., 2025; Lnenicka et al., 2025) show that sector-specific operational knowledge consistently shapes cybersecurity performance.

Operationalizing Cybersecurity in High-Risk Environments

The case studies highlight that implementing cybersecurity protocols in high-risk sectors requires seamless coordination, shared situational awareness and organizational trust. Failures occurred not because threats were undetected but because escalation, communication and authority structures did not function under pressure.

In Case 3, a critical API vulnerability remained unpatched for months because cybersecurity and engineering teams lacked a shared understanding of the operational risks. Case 5 showed that telecom staff could not correlate multi-vector attacks due to fragmented monitoring, unclear authority and risk-averse leadership. These findings reflect Bechara & Schuch (2021), who argue that execution failures often determine the severity of incidents.

The cases also illustrate the socio-technical misalignment described by Friday et al. (2024), in which technical systems advance more rapidly than organisational readiness. Effective operationalization requires shared mental models and collaborative processes (Stavrou & Piki, 2024; Kandpal et al., 2025), both lacking in several case environments. For example, rail engineers and cybersecurity personnel in Case 3 mistrusted each other's judgment, prolonging exposure to a dangerous vulnerability.

As Khaw et al. (2024) and Al-Hawamleh (2024) note, cybersecurity must be embedded into everyday operational routines, not treated as a separate IT function. The cases demonstrate that organizations without this integration struggled to act decisively during incidents.

Implications of the Cybersecurity Skills Gap for Resilience

The cybersecurity workforce shortage undermines resilience by creating delays, underutilized technology, fragmented workflows and chronic burnout. Across all cases, staff hesitated due to unclear responsibilities or insufficient confidence to act. In Case 4, the absence of AI-literate incident responders delayed containment. In Case 5, reputational concerns and unclear escalation pathways slowed the telecom provider's response to simultaneous attacks.
These observations support Singh et al. (2023), Xenakis et al. (2025) and Otoom et al. (2025), who identify burnout, skill misalignment and retention problems as significant contributors to cyber risk. The cases suggest that resilience is an emergent property of aligned people, processes and technologies, consistent with socio-technical perspectives (Bechara & Schuch, 2021). Even advanced security tools failed when institutional culture discouraged cross-functional coordination or when leadership hesitated to take visible action.

Sectoral norms also shaped response patterns: energy prioritized continuity, transportation safety, finance compliance and telecom service availability. These findings align with Stavrou & Piki (2024), who argue that effective cybersecurity requires coherence across technical, cultural and organizational dimensions.

The cases collectively indicate that addressing the skills gap requires not only increasing staffing but cultivating hybrid roles, contextual fluency and shared organizational understanding of cybersecurity. Regulators should incorporate workforce capability into resilience requirements, and training must become more cross-functional and sector-specific (Khaw et al., 2024; Xenakis et al., 2025).

In sum, resilience in critical digital infrastructure depends not on technological sophistication alone but on the socio-technical alignment of people, processes and tools. Skilled personnel remain the decisive factor in whether cybersecurity measures succeed under real-world pressures.

Conclusion

This study examined how the cybersecurity workforce gap affects resilience across critical digital infrastructures, focusing on energy while drawing comparisons with transportation, finance, and telecommunications. Using a systematic literature review and multi-sector case studies, it shows that cybersecurity resilience depends not only on technology but on the human capacity to deploy, interpret, and adapt it in real-world conditions.

Across sectors, the gap reflects not just a shortage of personnel but a lack of hybrid capabilities. Modern cybersecurity requires professionals who combine technical expertise with domain-specific knowledge, such as SCADA systems in energy, safety assurance in transportation, regulatory compliance in finance, and vendor ecosystem management in telecommunications. Case studies reveal that ineffective incident response is rarely due to technological limitations; instead, it stems from insufficient personnel able to coordinate, interpret, and operationalize available tools in high-pressure environments. This aligns with sociotechnical perspectives, where resilience depends on the alignment of technical, human, and institutional systems.

Sector-specific cultures further shape response outcomes. In energy, risk aversion delays action; in transportation, safety priorities extend vulnerability windows; in finance, organizational silos hinder coordination; and in telecommunications, vendor complexity and reputational concerns slow escalation. These patterns highlight the need for cohesion across cultural, operational, and technical domains.

Existing research also shows that generic training is inadequate for critical infrastructure contexts. Effective workforce development must be cross-functional, experiential, and tailored to sector-specific challenges, particularly in rapidly evolving and highly interconnected environments.

This study calls for a systemic rethink of cybersecurity workforce development. Increasing headcount alone is insufficient; emphasis must be placed on hybrid skills, contextual awareness, and collaboration. Policymakers should integrate workforce readiness into resilience frameworks, academia should align curricula with industry needs, and organizations must invest in interdisciplinary roles.

Ultimately, resilient digital infrastructure depends on skilled and empowered people. Bridging the workforce gap is therefore not only a technical priority but a strategic imperative for security, stability, and public safety in the digital era.

Implications of this Study for Academics, Practitioners and Policymakers

This study highlights critical implications for strengthening resilience in digital infrastructures. Cybersecurity workforce shortages in sectors such as energy, finance, and transportation represent not just a staffing issue but a systemic operational risk. Addressing this requires prioritizing human capabilities, sector-specific expertise, and organizational integration alongside technical solutions.

Unveiling a Conceptual Framework for Infrastructure Resilience

A key contribution is a conceptual framework positioning cybersecurity workforce capability as the foundation of resilience. Informed by a systematic literature review and multi-sector case studies, it illustrates how workforce capacity interacts with sector demands, operational contexts, and emerging technologies to support resilience in critical digital infrastructure systems.

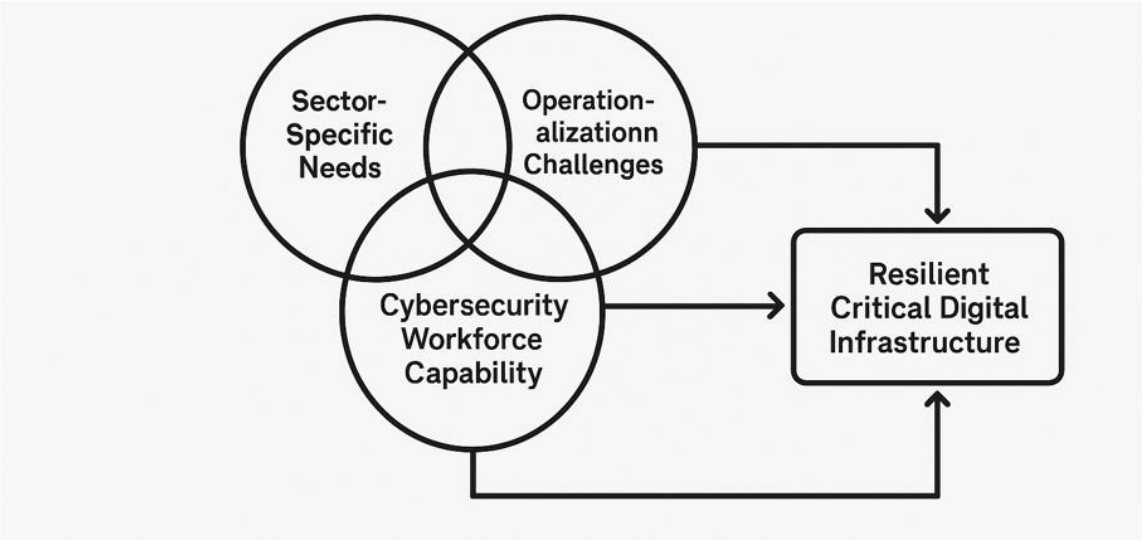


Figure 1. Conceptual framework showing how cybersecurity workforce capability interacts with sectoral demands, operational contexts, and emerging technologies to strengthen resilience in critical infrastructure.

At the core of the framework is **Cybersecurity Workforce Capability**, encompassing the skills, competencies, and institutional knowledge required to defend critical systems. Drawing on a Systematic Literature Review and multi-sector case studies, this study shows that

capability is dynamic and must be continuously developed to address evolving threats, particularly in high-risk sectors such as energy, finance, and transportation.

Three interdependent drivers surround this core:

Sector-Specific Needs
Each sector operates under distinct conditions. Energy must secure legacy OT integrated with modern IT, while finance manages high-volume transactions and strict compliance. Effective cybersecurity therefore requires tailored strategies, combining technical expertise with sector knowledge, regulatory awareness, and mission alignment.

Operationalisation Challenges
Barriers such as legacy systems, fragmented governance, complex supply chains, and cultural divides between IT, OT, and business units hinder implementation. Cybersecurity professionals must go beyond technical skills to embed security into everyday operations and workflows.

Emerging Technologies
Technologies like AI, blockchain, and industrial IoT introduce both opportunities and risks. As threats evolve, continuous upskilling is essential; without it, advanced tools cannot deliver resilience. Figure 1 illustrates these drivers as interconnected elements contributing to resilient infrastructure. Feedback loops emphasize adaptability: resilient systems enable continuous learning, reduce burnout, and strengthen security culture. Overall, the framework positions the cybersecurity workforce as the link between people, processes, and technology, highlighting that resilience depends on skilled, adaptable, and sector-aware professionals - not tools alone.

A Conceptual Framework Mapping the Impact of Cybersecurity Skills Gaps on Infrastructure Resilience



Figure 2: Conceptual framework on Cybersecurity Skills Gap Impact Pathway

The second framework, the **Cybersecurity Skills Gap Impact Pathway** (Figure 2), illustrates how workforce shortages undermine the resilience of critical digital infrastructure. Based on five case studies across energy, transport/logistics, and finance, it maps how workforce gaps evolve into systemic risk, reframing them as operational and security-critical threats rather than isolated HR issues.

The pathway consists of five stages:

Workforce Shortages*:* All sectors face shortages of skilled professionals capable of managing complex cyber-physical systems. These stem from limited talent supply, skill mismatches, and rapid technological change outpacing training systems.

Operational Gaps*:* Staff shortages delay key functions such as patching, monitoring, incident response, and compliance. This weakens cybersecurity hygiene and limits integration of security into daily operations, especially where legacy OT converges with modern IT.
Increased Vulnerabilities: Persistent operational gaps leave systems unpatched, misconfigured, and exposed to supply chain risks. These vulnerabilities accumulate and increase exposure to exploitation.
Higher Attack Risks: Unresolved weaknesses attract sophisticated threat actors, including ransomware groups and state-sponsored adversaries, who target under-defended infrastructure using known tactics.
Reduced Infrastructure Resilience*:* As vulnerabilities grow, resilience declines. Systems become less capable of anticipating, withstanding, and recovering from cyber incidents. A key feature is the feedback loop from reduced resilience back to workforce shortages. Repeated failures and stressful response environments drive burnout, attrition, and reduced workforce attractiveness, worsening the skills gap. Disrupting this cycle requires investment in workforce well-being, training, and retention.

The framework demonstrates that skills gaps propagate through operations into organization-wide vulnerabilities. A well-supported, cross-functional workforce is essential for maintaining resilience. For policymakers, it highlights the need for sector-specific training, interdisciplinary funding, and workforce development integrated into resilience policies. Together with Figure 1, it positions workforce capability as central to infrastructure resilience.

Future Research and Limitations of this study

Avenues for further research: Future studies should explore sector-specific workforce challenges in greater depth, including additional critical domains such as healthcare and water utilities. Comparative international research could address global disparities in cyber maturity and workforce development.
The role of automation and AI in reducing workforce strain also warrants investigation, particularly regarding impacts on workload, decision-making, and governance. Additionally, organizational culture and leadership require deeper analysis; qualitative approaches such as ethnography could reveal how leadership influences workforce readiness and response effectiveness.

Limitations of this Study: This study has several limitations. First, the five cases, while diverse, is not statistically representative; larger studies are needed to validate findings. Second, the qualitative approach limits the ability to establish causality or quantify relationships between variables such as staffing levels and incident frequency.
Finally, the rapidly evolving cybersecurity landscape means the findings represent a current snapshot. Continuous reassessment is necessary to ensure workforce strategies remain aligned with emerging threats, technologies, and regulatory changes.

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WHEN CENTRALITY INCREASES CONFORMITY: THE ROLE OF GROUP IDENTIFICATION

Shalev, Edith[1]; Moldovan, Sarit[1]

[1]Department of Management and Economics, The Open University of Israel, Ra'anana, Israel

Keywords: Network Centrality, Conformity, Self-Construal, Group Identification, Social Influence

Social influence shapes attitudes and purchase decisions and often spreads through consumers who occupy central positions in social networks. Because these consumers play a key role in diffusion, understanding how their preferences are shaped is critical. Are central consumers independent trendsetters, or are they more likely to conform?

Prior research offers mixed answers to this question. The dominant explanation to date emphasizes status, arguing that highly central consumers can "rise above" social norms and resist peer influence (e.g., Iyengar *et al*., 2015). However, this account cannot explain why central consumers sometimes exhibit greater conformity (Lee *et al*., 2010), leaving open the question of when and why centrality promotes conformity.

We propose that centrality can be understood not only in terms of status but also through group identification—the extent to which group membership is incorporated into the self-concept (Doosje *et al*., 1999). High centrality involves frequent interactions with group members, which heightens group salience and strengthens identification, rendering the group psychologically rewarding by providing belonging and enhanced self-worth (McFerran and Argo, 2014). Because group identification promotes conformity to group norms (Cialdini and Goldstein, 2004), higher identification among central consumers should translate into greater conformity.

H1: High-centrality members will exhibit greater conformity to group preferences than low-centrality members.

H2: Group identification will mediate the effect of centrality on conformity.

We further suggest that this process depends on individuals' self-construal—the extent to which they define themselves as interdependent rather than independent relative to groups (Singelis,

1994). The positive relationship between centrality and conformity should be weaker among individuals with a more independent self-construal.

H3: Self-construal will moderate the centrality–conformity association.

Study 1 examined the association between network centrality and conformity in a naturalistic online setting (N = 175). Participants interacted in private group networks and responded to opinion polls. Consistent with H1, higher centrality was associated with greater conformity to the group's votes (B = .141, p = .037).

Study 2a tested the mediation of group identification. Participants (N = 200) nominated a group and reported how many group members they engaged with, how similar their product choices were to those of most group members, and their group identification. Consistent with H1–2, centrality positively predicted conformity (B = .985, p = .019), and this effect was mediated by group identification (B = .415, 95% *CI* [.114, .836]).

Study 2b (N = 300) provided causal support for this process using an experimental manipulation.

Study 3 examined whether self-construal moderates the centrality–conformity relationship. Participants (N = 335) indicated how central they were and how engaged they were with popular consumption trends. Moderated mediation analysis showed that centrality predicted group identification (B = 4.101, p < .001). A significant centrality × self-construal interaction (B = 14.96, p = .015) indicated that the effect increased with interdependence. This interaction was mediated by group identification (B = 1.995, 95% *CI* [.311, 4.57]).

Study 4 replicated the results for situational self-construal (N = 282), showing that centrality increased conformity in the social setting (M_{high} = 4.328, M_{low} = 3.829, p = .013) but not in the competitive setting (M_{high} = 4.050, M_{low} = 4.272, p = .268).

Across five studies, we show that centrality increases group conformity by strengthening group identification. Our findings reconcile prior mixed results by reframing centrality not merely as a marker of status or influence, but as a driver of group identification. Moreover, firms may benefit from central consumers' tendency to align with group preferences by tailoring messages to fit community norms, particularly in socially connected and supportive communities.

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SYMBOLIC ADVERTISING, MORAL BOUNDARIES AND RELIGIOUS CONSUMER CHOICES IN RESILIENT MARKETS

Kriaučiūnaitė-Lazauskienė, Gintarė[1]
[1]Faculty of Communication, Vilnius University, Vilnius, Lithuania

Keywords: Symbolic advertising, Religious consumers, Moral negotiation, Grounded theory, Consumer behaviour, Brand loyalty, Sustainability, Resilient markets.

Introduction

Symbolic and controversial advertising increasingly draws on sacred, gendered and culturally sensitive imagery. For religious consumers such messages are not neutral stimuli but moral events requiring interpretation and response, with consequences for brand trust and resilience. Research remains concentrated in Anglo-American and Islamic settings, while evidence from the Baltic states is scarce, even though moral judgement there has been sharpened by geopolitical instability (French et al., 2023).

Purpose, Aim and Objectives

This study examines how symbolic and controversial advertising shapes the moral responses of religious consumers, and what this implies for sustainable and resilient markets. It aims to construct a grounded explanation of moral negotiation rather than to measure attitudes. The objectives are to identify the symbolic frames through which religious consumers interpret such advertising, to explain how they reconcile faith with consumption choices, and to contrast practitioners' instrumental justifications with consumers' moral reactions.

Literature Review and Theoretical Framework

Religious and controversial symbols are consequential because morality and values inform attitudes and purchase intentions, reactions towards advertising that range from emotional engademen to rejection (Çam et al., 2025). The study is framed by symbolic interactionism (Blumer, 1986), which treats advertising symbols as actively constructed within social, cultural and religious contexts rather than passively received. Survey and experimental designs dominate and grounded theory is rarely applied, leaving the processual character of moral judgement unexplained.

Methodology and Methods

Constructivist grounded theory (Charmaz, 2014) was adopted because it treats meaning as jointly constructed and suits processual questions. Twenty semi-structured interviews were conducted in Lithuania, Latvia and Estonia with ten Christian consumers and ten marketing specialists, purposively selected for diversity in age, gender, religiosity and experience. Interviews lasted 60–90 minutes and were transcribed verbatim. Initial, focused, axial and theoretical coding was supported by memo writing and MAXQDA; saturation was reached at the nineteenth interview. Member validation and triangulation with regional campaigns strengthened credibility.

Findings and Contribution

Six categories were constructed: moral conflict in everyday life, religious symbols in advertising, gender and sexualisation, brand loyalty versus moral dissonance, cultural dialogue, and moral reflections on brand symbolism. Together they form the Moral Negotiation in Consumer Behaviour (MNCB) theory, in which an advertising stimulus enters a negotiation process moderated by religious identity, cultural values, social environment and geopolitical context, issuing in four responses: ambiguous approval, reconceptualisation, internal conflict, and rejection. Rejection is driven by perceived trivialisation rather than by religious symbolism itself: respectful use elicits pride, whereas sacred imagery combined with sexualised treatment provokes resistance. Practitioners read shared controversy as success; consumers read it morally.

Originality and Value

The study treats moral response as an ongoing, socially constructed negotiation rather than a fixed trait, and does so in an under-researched region. It extends the Moral Negotiation theory developed with Lithuanian consumers (Kriaučiūnaitė-Lazauskienė, 2026) to three Baltic states and adds marketing experts alongside consumers, permitting direct comparison of professional and consumer frames.

Research Limitations

The purposive sample (N=20) covers one religious tradition in three culturally proximate countries, so the theory supports analytical, not statistical, generalisation. Some responses may

reflect social desirability or generalised scepticism towards advertising, and comparative work across other faith traditions is needed.

Theoretical and Practical Applications and Implications

Theoretically, the study positions moral values as an active source of interpretation, extending decision-making research beyond rational and affective accounts. Practically, it challenges the assumption that controversy is costless publicity, since among religious segments the durable outcome is lost trust. Managers should pre-test campaigns using sacred imagery with the affected communities and adapt rather than transfer controversial formats; an industry code developed with religious communities would support more resilient markets.

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PRESERVING CONSUMER CONTROL IN ULTRA-DISCOUNT ONLINE MARKETPLACES

Rudienė, Elzė[1] ; Žirnelis, Valdas[1]; Morkūnas, Mangirdas[1]

[1]Business School, Vilnius University, Vilnius, Lithuania

Keywords: Consumer control, Online marketplaces, Impulse purchasing, Self-regulation, Interface design, Decision support

Introduction and Purpose

Promotional interfaces can make shopping attractive while making it difficult for consumers to act on their own spending priorities. This conceptual paper examines consumer control in ultra-discount online marketplaces. It asks: under what conditions can decision-support features help shoppers maintain their purchasing goals without unnecessarily obstructing voluntary purchases? The objective is to develop propositions linking the design of these features to the alignment between intended and realised spending. The problem is particularly relevant when several promotional features compete for attention within the same shopping journey. In this setting, a spending reminder may become another message to dismiss. The conceptual challenge is therefore to identify when support remains usable and meaningful under promotional pressure, rather than merely adding information to an already demanding interface.

Theoretical Framework and Approach

Bandura (1991) conceptualises self-regulation through self-monitoring, judgement against personal standards and self-reaction. This perspective directs attention to whether an interface enables shoppers to recognise and respond to departures from their goals. Experiments by Luguri and Strahilevitz (2021) show that interface manipulation can change consumer choices, establishing why design deserves scrutiny. However, lower purchasing alone cannot establish that a protective intervention benefits consumers.

The paper uses conceptual integration of these perspectives to distinguish three properties of decision support: relevance to a previously stated goal, timing before commitment, and consumer authority to accept or override the intervention. The resulting propositions concern

the conditions under which support may work. They are not presented as tested findings. These properties are expected to interact. Personal relevance may have limited value if a prompt arrives after an irreversible decision, while an early intervention may still undermine autonomy if consumers cannot dismiss it. The framework consequently treats effectiveness as conditional on the combination of design properties and the shopper's goals.

Propositions and Research Design

First, a reminder linked to a shopper's own spending limit is proposed to improve goal alignment more than a generic warning, because it makes a personally relevant comparison available at the point of choice. Second, support introduced before checkout commitment is proposed to enable more revision than an equivalent message delivered afterwards. Third, consumer-controlled prompts are proposed to preserve perceived autonomy better than compulsory interruptions, although easy overrides may weaken their influence on spending.

A proposed factorial experiment would vary personalised versus generic reminders, intervention timing, and optional versus mandatory interruption in a simulated marketplace. Participants would specify spending limits and intended product categories before shopping. Prices, products and promotional exposure would remain constant across conditions, with an additional no-intervention control. Random assignment would support causal comparisons; the required sample would be determined through an a priori power analysis.

Primary outcomes would be spending above the stated limit and purchases outside intended categories. Perceived autonomy, decision confidence, frustration and task abandonment would identify possible benefits and costs. Analyses would test interactions between the three design properties. A successful intervention would improve goal alignment while avoiding disproportionate burdens on shoppers whose purchases already match their intentions. Manipulation checks would establish whether participants notice the prompts, understand their connection to spending goals and recognise the available override options. Measures collected after shopping would distinguish deliberate changes in purchasing priorities from choices participants subsequently regard as inconsistent with their intentions. This distinction would prevent every departure from an initial plan from being classified automatically as a failure of consumer control.

Contribution and Limitations

The contribution is an evaluative framework that treats consumer-defined goal alignment as distinct from conversion reduction. It specifies why the same interruption might assist one shopper and obstruct another. For marketplace managers, the framework offers testable criteria for assessing decision support alongside commercial outcomes.

The propositions remain untested. Stated goals may change legitimately during shopping, and simulated purchases may not reproduce financial consequences. Subsequent studies should therefore distinguish considered goal revision from unwanted overspending and validate the framework using consequential choices across platforms. The paper does not assume that every spontaneous purchase is harmful or that one protective design suits all consumers.

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STRATEGIC PERSONAL BRANDING IN ACADEMIA: FROM RESEARCH VISIBILITY TO UNIVERSITY REPRESENTATION

Venciute, Dominyka

ISM University of Management and Economics, Vilnius, Lithuania

Keywords: personal branding, organizational outcomes, employee advocacy

Introduction

Personal branding has evolved from a concept traditionally associated with celebrities and entrepreneurs into a strategic practice relevant across professional domains, including academia. It can be defined as a proactive and intentional process through which individuals create, position, and maintain a distinctive professional identity that communicates their value to relevant audiences (Gorbatov et al., 2018; Venciute, Yue, & Thelen, 2023). In academic environments, where reputation, credibility, and visibility are central to career advancement, personal branding plays an increasingly important role. The expansion of professional social media platforms further reinforces this shift by enabling academics to communicate their expertise, disseminate research, and engage with broader audiences (Labrecque et al., 2011).

Despite these developments, limited research has examined personal branding as a strategic mechanism that simultaneously enhances individual academic visibility and strengthens institutional representation.

Literature Review

Personal branding is widely conceptualized as a strategic and value-driven process involving the communication of a unique professional identity through consistent narratives and signals (Gorbatov et al., 2018). Prior research demonstrates that personal branding contributes to individual outcomes such as visibility, employability, and career advancement (Gandini, 2016; Gorbatov et al., 2019). At the same time, it also produces organizational benefits, particularly when practiced by individuals whose roles are closely tied to institutional representation (Bendisch et al., 2013).

Venciute, Yue, and Thelen (2023) extend this perspective by showing that leaders' personal branding on LinkedIn is driven by both personal motivations and organizational goals. Their communication enhances not only individual credibility but also organizational visibility, trust, and reputation. Leaders' personal brands therefore function as an extension of organizational identity.

Complementing this perspective, research on employee advocacy conceptualizes employees as credible communicators who influence stakeholder perceptions of the organization (Thelen, 2020). Venciute et al. (2023) demonstrate that employees' social media communication affects attitudes toward the brand through the mediating role of parasocial relationships.

Method

This extended abstract adopts a conceptual integration approach based on two complementary empirical studies. The first study (Venciute, Yue, & Thelen, 2023) uses qualitative in-depth interviews with organizational leaders to explore the motivations, processes, and outcomes of personal branding on LinkedIn. This approach provides insights into how individuals strategically develop their personal brands and how these efforts relate to organizational outcomes.

The second study (Venciute et al., 2023) employs a quantitative research design using survey data from LinkedIn users. Structural equation modeling is used to examine the relationships between employee communication, source credibility, parasocial relationships, and attitudes toward the brand. Together, these studies offer a comprehensive understanding of how individual communication practices influence both personal and organizational outcomes.

Discussion and Conclusions

The integration of these studies highlights that personal branding and employee advocacy are interconnected strategic mechanisms. Personal branding enables individuals to establish a credible and distinctive professional identity, while employee advocacy amplifies organizational communication through authentic individual voices.

In academia, this interplay is particularly relevant. Academics act as boundary-spanning actors who represent both their own expertise and their affiliated institutions. Their communication

practices contribute to research visibility and shape how institutions are perceived by external audiences.

The concept of parasocial relationships further explains why individual communication is effective. Audiences are more likely to trust individuals than institutional messages, particularly when communication is perceived as credible and informative (Schivinski & Dabrowski, 2016). This positions academics as key communicators who can humanize institutional brands and strengthen stakeholder engagement.

The findings suggest that personal branding enhances research visibility, strengthens audience engagement, and contributes to institutional reputation. Universities can further benefit by supporting academics' communication efforts as part of broader branding strategies. Overall, personal branding and employee advocacy represent complementary approaches that enable academics to increase their professional impact while contributing to the visibility and credibility of their institutions.

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Digital Heritage and the Shaping of Post-Communist Memory: A Netnographic Perspective

Lascu, Dana-Nicoleta[1]

[1]Robins School of Business, University of Richmond, Richmond, United States

Keywords: Digital Heritage, Socialist Brands, Consumption Nostalgia, Netnography

Introduction

The heritage of communism in Eastern Europe continues to shape contemporary digital culture, influencing how the past is remembered and reconstructed in online environments (Velikonja, 2009). Social media platforms, digital archives, and participatory memory initiatives have enabled individuals to revisit life under socialism, transforming memories into shared cultural narratives (Assmann, 2011; Kalinina & Menke, 2016). These platforms facilitate the circulation of nostalgic content featuring familiar brands, which carry symbolic associations with belonging, simplicity, and perceived social equality (Berdahl, 2010). While prior research has focused largely on political memory, the role brand-related memories in post-communist digital heritage remains underexplored. This study addresses this gap, examining how socialist-era brands are remembered.

Purpose, Aim, and Objectives

This study investigates how digital communities reconstruct and reinterpret socialist-era brands within nostalgic discourse. The research is motivated by the growing importance of social media as a site of collective memory formation. The primary aim is to understand how brand-related memories persist and evolve in digital spaces by identifying recurring brand-related cultural motifs in social media discourse; examining how nostalgic narratives contribute to identity construction and community participation; and exploring the emotional and symbolic meanings attached to socialist-era brands.

Literature Review and Theoretical Framework

The study draws on cultural memory theory, digital heritage, and consumer culture theory. Cultural memory research examines how societies construct shared understandings of the past through mediated practices, increasingly shaped by digital technologies enabling participatory

remembrance (Assmann, 2011). Digital platforms allow individuals to collectively remember and reinterpret the past, often through symbolic objects (Kalinina & Menke, 2016), such as brands. Social media is critical in reviving nostalgic brand content, enabling collective engagement (Gręboszk-Krawczyk et al., 2021). Marketers also leverage these platforms to reconnect consumers with the past (Youn & Jin, 2017). Despite these insights, the intersection of brand memory and digital nostalgia remains insufficiently explored. This study addresses this gap by positioning brands as symbolic carriers of memory within digital environments.

Method

The study uses netnography, which enables systematic observation and interpretation of social media interactions, capturing how meanings are constructed and shared in virtual spaces (Kozinets, 2020). Data were collected through systematic observation of Romanian Facebook and Instagram posts, hashtags, blogs, and comment threads published between 2010 and 2026. This timeframe is based on the argument that, while memories of the communist regime have largely consolidated within historical narratives, affect-laden recollections, particularly those tied to familiar brands, persist in digital spaces – this distinction is consistent the fact that individuals separate evaluations of political systems from memories of lived experience, preserving associations related to material culture (Berdahl, 2010). The analysis focuses on brands across consumer goods categories. Dimensions examined were brand-related emotions and thematic associations.

Expected Findings and Contribution

The findings indicate that socialist-era brands function as enduring carriers of primarily positive memories in digital spaces. Recurring themes include reflections on product quality, affordability, and the use of brands as markers of generational identity. Findings demonstrate that brand memories play a significant role in shaping post-communist digital heritage.

Originality and Value

This study uses netnography to focus on the intersection of digital heritage and socialist brand memory, thus extending socialist-era research beyond critical political narratives.

Research Limitations

The evolving nature of digital platforms presents challenges related to data stability and methodological consistency (Adriaansen & Smit, 2025). Additionally, the focus on Romanian social media contexts may limit generalizability. Future research could address these limitations through mixed-method designs.

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CSR PERCEPTIONS AND BRAND LOYALTY AMONG GENERATION Z FASHION CONSUMERS IN ADVANCED AND EMERGING MARKETS

Hofer, Katharina Maria[1]; Bianchi, Constanza[2]

[1] Institute for Retailing, Sales and Marketing, Johannes Kepler University Linz, Austria

[2] School of Business, Universidad Adolfo Ibañez, Santiago, Chile

Keywords: CSR, Brand Loyalty, Generation Z, Emerging Market, Fashion Industry

Introduction

The topic of CSR has gained the attention of academia, society and business practice likewise (Hildebrand, Sen and Bhattacharya, 2011). While numerous empirical studies on CSR have taken a managerial perspective, consumer perceptions of CSR have received comparatively less research attention (e.g., da Fonseca, Rocha and Alves, 2024). Generation Z consumers are especially concerned with sustainability, and it is an increasing customer segment on a global level (Narayanan, 2022).

Purpose, Aim and Objectives

This study examines the impact of CSR perceptions of Generation Z consumers on fashion brand loyalty in both advanced and emerging markets. We hypothesize the positive impact of the three CSR dimensions of environmental, social and economic responsibility on brand loyalty, respectively. Furthermore, we suggest a positive relationship between brand loyalty and online brand-related activities.

Literature Review and Theoretical Framework

We base our study on the Triple Bottom Line principle by Elkington (1998), including the three dimensions of economic, environmental and social responsibility. This approach has been widely accepted in the literature (e.g. Luger, Hofer and Floh 2022).

Methodology

To test the hypotheses, we employed a quantitative approach analyzing data with 203 responses from Chile and 211 from Germany. We relied on existing scales from the literature and used partial least squares (PLS) path modeling for data analysis.

Main Findings and Contribution

Empirical findings reveal that the social responsibility dimension of consumers' CSR perception has a positive influence on brand loyalty. Moreover, we found a positive effect of brand loyalty on online brand-related activities. We also investigated the two subsamples of Chile and Germany to account for potential differences between the two markets. In Germany, environmental responsibility and social responsibility each have a positive and significant effect on brand loyalty, as opposed to non-significant paths in the Chilean subsample.

Originality and Value

This study adds to the literature by providing a cross-market, consumer-based perspective on CSR perceptions among Generation Z fashion shoppers in advanced and emerging markets.

Research Limitations

We employed a cross-sectional research design and a Western European country representing an industrialized, advanced market, and an emerging market located in South America. Future research could focus on consumers in other markets or regions to further add to the generalizability of results. Although two of the four hypotheses of the total sample could be supported, the R^2 values are low. Thus, alternative conceptual models should be tested in future empirical research.

Theoretical and Practical Implications

The results show differences across markets, thus advancing the literature on international marketing. Due to the comparatively limited availability of cross-national empirical studies on consumer perceptions of CSR among Generation Z, this paper expands the literature by identifying specifics regarding advanced and emerging markets. Previous findings on the relationship between CSR and customer loyalty in emerging markets have remained inconsistent for emerging markets (e.g., Latif, Perez and Sahibzada, 2020). Marketing managers who are in charge of corporate social responsibility activities are encouraged to

highlight the social responsibility component of CSR in order to increase brand loyalty. Also, we suggest taking various measures to enhance brand loyalty, as it is not only associated with repeat purchase, but also with online activities related to the brand.

Keywords: CSR, Brand Loyalty, Generation Z, Emerging Market, Fashion Industry

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ESG DISCLOSURE AND COST OF CAPITAL IN LISTED ITALIAN SMES: EMPIRICAL EVIDENCE FROM A MULTI-CASE STUDY

Scalise, Vittoria[1]; Iacoviello, Giuseppina[2]; Cavallini, Iacopo[2]; Schittenhelm, Frank Andreas[3]

[1]Department of Economic Sciences, "Niccolò Cusano" University, Rome, Italy

[2]Department of Economics & Management, University of Pisa, Pisa, Italy

[3]School of Business Management and International Finance, Nürtingen-Geislingen University, Nürtingen, Germany

Keywords: ESG disclosure, cost of capital, Italian SMEs, WACC, signaling theory, CSRD, Multicase

Abstract

Purpose, aim and objectives: This study investigates the impact of ESG disclosure on the cost of capital in Italian SMEs listed on Euronext Growth Milan, a context underexplored in the literature. The primary objective is to test three hypotheses: (H1) a negative ESG-WACC/CoE/CoD relationship; (H2) heterogeneity in pillar-specific effects; (H3) moderation by structural factors (leverage, size, ESG trends).

Literature review and theoretical framework: The research draws on signaling theory (Spence, 1973), agency theory (Jensen & Meckling, 1976), and legitimacy theory, addressing the empirical gap on post-NFRD/pre-CSRD Italian SMEs. Existing studies show mixed ESG effects for SMEs (e.g., increased CoC in some contexts) but highlight the crucial role of the E-pillar on debt and the G-pillar on equity.

Methodology and methods:

Quantitative multi-case study on 7 innovative SMEs (2020-2024), using Refinitiv/Bloomberg data. Multivariate OLS regressions test H1-H3, including controls (Size_ln, Leverage, ROA, Growth, Tech_dummy) and moderating interactions. Diagnostics: R^2 0.68-0.72, VIF <3, Jarque-Bera normality.

Main findings: The multivariate OLS analysis provides support H1 (negative ESG-WACC relationship: CoD r=-0.56***, CoE r=-0.48**, WACC r=-0.52***; 100 bps CoD reduction low-

to-high ESG, €200K annual savings for €50M asset SME); H2 receives partial support with pillar heterogeneity (E strongest on CoD r=0.56*, G on CoE r=-0.29*, S marginal); H3 receives directional support (stronger effects in high-leverage/small-size/low-baseline SMEs via catch-up dynamics).

Originality and value: This paper analyzes the effects of different ESG pillars on the cost of capital of listed Italian SMEs, a previously underexplored area. The temporal approach, which captures the critical pre-CSRD transition period, reveals debt-centric signaling patterns unique to the Italian bank-centric context and pillar-specific strategies (E-pillar for banks, G-pillar for equity) that are particularly relevant for SME CFOs. The findings offer strategic guidance for capital allocation efficiency and open avenues for longitudinal analyses and stronger causal identification on unlisted SMEs.

Introduction

The communication of environmental, social, and governance (ESG) information has assumed an increasingly central role in both international and Italian corporate reporting. However, the empirical relationship between ESG disclosure and crucial financial parameters—particularly the cost of capital (WACC, Cost of Equity, Cost of Debt)—remains insufficiently explored in the specific context of Italian small and medium-sized enterprises (SMEs).

SMEs constitute the vast majority of the European entrepreneurial ecosystem: over 99.8% of firms in the EU and 90% in Italy. They represent a fundamental engine of the Italian economy, contributing 50-70% to employment and over 70% to aggregate turnover (Todericiu, 2021).

Despite this structural relevance, the financial literature has historically prioritized large listed companies, leaving an important knowledge gap regarding the mechanisms through which sustainability affects the cost of capital in SMEs (Vitolla et al., 2020; Cortellini, Panetta, 2021).

The Italian and European regulatory context has undergone a radical transformation in recent years. Legislative Decree 254/2016 (transposing Directive NFRD 2014/95/EU) imposed limited non-financial reporting obligations on large public-interest entities. The Corporate Sustainability Reporting Directive (CSRD, EU Directive 2022/2464), currently under transposition in Italy, will significantly expand the regulatory scope progressively from 2025 to include SMEs with at least 250 employees or €40 million in turnover (European Commission, 2024). This regulatory turning

point underscores the importance of understanding how ESG disclosure influences financing costs for Italian SMEs during the transition phase.

Literature review and theoretical framework

The literature on ESG disclosure and cost of capital integrates three complementary theoretical strands—signaling theory (Spence, 1973), agency theory (Jensen & Meckling, 1976), and pecking order theory (Myers, 1984) — applied to evidence that remains mixed and context-dependent, particularly scarce for Italian SMEs.

Signaling theory posits that costly, verifiable ESG disclosure serves as a credible signal of managerial quality and future sustainability in high-asymmetry contexts characteristic of Italian SMEs, marked by concentrated ownership, limited analyst coverage, and opaque information environments (Connelly et al., 2010). Such disclosure attracts lower-risk investors and compresses embedded risk premia, particularly through standardized, third-party assured reporting that differentiates high-quality firms from opportunistic signalers (Healy & Palepu, 2001).

Agency theory emphasizes the Governance pillar's role in mitigating principal-agent conflicts prevalent in family-controlled Italian SMEs, where ownership concentration amplifies monitoring costs. Transparent governance structures—board independence (>50% non-executives), CEO-Chair separation, and anti-corruption protocols — may reduce perceived agency risk, compressing cost of equity as investors perceive lower expropriation threats (Jensen & Meckling, 1976).

Pecking order theory illuminates SME-specific financing hierarchies, where firms prioritize internal funds, relational bank debt, and equity as costliest resort (Myers, 1984). In Italy's bank-centric system, ESG disclosure may modulate cost of debt through dual channels: (i) Environmental pillar reduces informational asymmetry on transition risks (CBAM, ETS compliance), enabling tighter spreads; (ii) signaling eligibility for green/Sustainability-Linked Loans with favorable pricing (Bauer & Hann, 2014).

Empirically, Postiglione et al.'s (2024) analysis of 122 studies confirms predominantly non-negative ESG-financial performance correlations (58% significantly positive on ROA/ROE), but WACC evidence proves inconclusive. Extra-EU research reports robust CoE reductions (150-250 bps: Wang et al., 2026) and CoD compression (10-20 bps: Atan et al., 2018). European studies document 3-8% Kd reductions via transparency channels (Eliwa et al., 2021), while Italian SMEs

evidence reveals nuance: non-assured disclosure raises WACC by 0.30% in non-family firms but lowers it by 0.25% in family-owned ones, reflecting intrinsic credibility (Raimo et al., 2021).

Pillar heterogeneity—central to our analysis—remains underexplored. Environmental disclosure tends to be more relevant for CoD pricing in high-impact sectors (manufacturing, energy) due to regulatory materiality (Velte, 2022); Governance is often associated with CoE through agency risk reduction (Plumlee et al., 2015); Social exhibits weaker, indirect effects limited by measurement inconsistencies and lower financial materiality (Grewal et al., 2021).

The CSRD transition (2026 Listed SME Standard) amplifies these dynamics for Italian listed SMEs, extending granular, double-materiality ESRS reporting and limited assurance requirements. This regulatory shift motivates our hypotheses, addressing the critical knowledge gap regarding pillar-specific ESG pricing in bank-dominated SME financing contexts prior to full CSRD implementation.

Research hypotheses

Based on the theoretical and literature framework outlined, we formulate three falsifiable hypotheses:

H1: There exists a statistically significant and negative relationship between overall ESG performance/disclosure and cost of capital (WACC, Cost of Equity, Cost of Debt) in Italian listed SMEs.

H2: The three ESG dimensions (Environmental, Social, Governance) heterogeneously influence the cost of capital, generating distinct effects on WACC, CoE, and CoD.

H3: SME-specific structural factors—firm size, leverage level, initial ESG baseline, and temporal trend—moderate the relationship between ESG and cost of capital.

Methodology

Study design and sample

The study adopts a multi-case study approach on 7 Italian SMEs listed on Euronext Growth Milan and classified as innovative SMEs by AIDA. The integrated qualitative-quantitative design enables: (i) triangulation of secondary sources (Refinitiv, Bloomberg, AIDA); (ii) exploratory testing of causal hypotheses; (iii) context-specificity of the pre-CSRD regulatory transition.

The sample, selected using maximum variation theoretical sampling (Eisenhardt, 1989), covers 3 distinct profiles: 3 pure innovative non-listed SMEs (INN), 1 hybrid (INN-EU GRO), and 3 growth-listed only (EU-GRO). Represented sectors: Technology (43%, N=3), Industrials (29%, N=2), Energy (14%, N=1), Consumer Cyclicals (14%, N=1). Heterogeneity in size (assets range €100-150 million), leverage (range -0.24 to 0.42), and ESG baseline (range 3.47-41.31) enables testing of multiple moderators.

N	Company	Sector	ESG	CoD	CoE	Leverage	Indip %	ESG Class
1	Dominion Hosting (DHH.MI)	Industrials	24,39	2,4	6,6	0,05	20,0	High
2	Doxee (DOXE.MI)	Technology	34,49	5,8	6,5	0,42	40,0	High
3	Unidata (UD.MI)	Technology	23,78	2,3	8,4	0,24	33,3	High
4	Rosetti Marino (YRM.MI)	Energy	33,06	2,6	5,1	-0,24	11,1	High
5	TraWell (TRWL.MI)	Industrials	3,47	2,4	10,4	0,14	33,3	Low
6	Growens (GROWE.MI)	Technology	22,36	0,9	6,0	-0,20	33,3	Low
7	Monnalisa (MONNA.MI)	Consumer	41,31	4,9	14,4	0,25	40,0	High

Table 1: Sample Description

Research method

The empirical investigation is based on a dataset constructed from secondary financial and non-financial sources, integrated to analyze the relationship between ESG disclosure and cost of capital in Italian listed SMEs. Measures of Cost of Equity, Cost of Debt, and WACC were drawn from Bloomberg and Refinitiv, while overall ESG scores and individual Environmental, Social, and Governance dimensions come from Refinitiv, enabling comparable measurement of non-financial performance across the sample. The selection of these sources addresses the need to compare heterogeneous firms sharing increasing exposure to sustainability reporting logics and ongoing regulatory changes in the European and Italian context.

The analysis was conducted using multivariate OLS regressions, following the multi-case study logic outlined by Eisenhardt (1989) and Yin (2018). In the model, cost of capital serves as the dependent variable, while ESG disclosure constitutes the primary explanatory variable. The model

also incorporates a set of economic-financial and dimensional control variables to isolate the specific contribution of sustainability information to the determination of financing costs.

To test the hypothesis regarding moderators, interaction terms between ESG, leverage, and firm size were introduced to assess whether and to what extent the disclosure effect varies based on structural firm characteristics.

The adopted approach allows interpreting the results as exploratory evidence consistent with the theoretical framework developed in previous sections, where disclosure, legitimation, and reduction of informational asymmetries jointly explain cost of capital dynamics. Given the exploratory nature of the study and the limited sample size, the results should be interpreted as indicative evidence rather than definitive causal proof. In this perspective, the empirical design aligns with guiding theoretical references, particularly Spence's (1973) signaling theory and Jensen and Meckling's (1976) agency theory, which elucidate why more structured ESG disclosure can influence investors' and lenders' risk perceptions.

Empirical Results

Descriptive statistics and temporal trends

The sample analysis suggests a relationship between ESG disclosure and cost of capital, as evidenced by both descriptive statistics and multivariate estimates. The seven SMEs exhibit a balanced average profile, with a median ESG score of 24.39 (Refinitiv 0-100 scale), intermediate leverage (DE = 0.55), and contained size (Sizeln = 4.2). Average Cost of Equity stands at 6.8%, Cost of Debt at 3.2%, yielding an overall WACC of 5.1%—values broadly consistent with SMEs listed on Euronext Growth Milan.

Over the FY2020-FY2024 period, the sample's average ESG score grew by 214%: from 8.30 (FY-4) to 26.12 (FY0). This increase reflects acceleration post-Legislative Decree 254/2016 and CSRD anticipation. The Environmental pillar showed the strongest momentum (+13 points since 2022), driven by disclosures on emissions and energy policies; Social dominates with an average of 39.09 (SD=20.3), consistent with informal HR strategies; Governance remains relatively low (average 8.69), constrained by family-oriented governance structures and non-independent boards (average 30%).

Concurrently, Cost of Equity stabilised from peaks of 9.24 (FY-1) to 8.20 (FY0), suggesting possible risk premium mitigation via ESG signalling.

Cost of Debt shows a FY0 median of 2.40%, reflecting low costs due to real guarantees, albeit with sectoral variability. Overall WACC declined from 4.95% (FY-1) to 4.20% (FY0), consistent with H1's negative relationship hypothesis.

Total assets grew 40% (from €104 to €146 million), with ROA recovering from -4.45% (FY-4) to +7.32% (FY0), highlighting post-pandemic rebound. Average leverage fluctuates around 0.42, ranging from -0.24 (Rosetti Marino, cash-rich) to 0.42 (Doxee, growth-intensive).

Correlations and High vs. Low ESG comparison

Variable	ESG	CoE	CoD	Leverage	Indip %
ESG	1,00	0,08	0,12	0,15	0,03
E_pillar	0,92	0,07	0,56*	0,22	-0,10
S_pillar	0,88	-0,02	0,74**	0,28	0,12
G_pillar	0,75	-0,29*	-0,36*	-0,15	0,45

Table 2: Bivariate Correlation Matrix (Pearson, N=7)

The ESG-CoE correlation is positive but weak (r=0.08), suggesting initial legitimation effects with temporal lags. More relevant are ESG×Leverage (r=0.15) and ESG×PctIndip (r=0.03), indicative of structural interactions. Pillar disaggregation reveals differential patterns: **E** strongly correlates with CoD (r=0.56*), reflecting environmental impact on financing; **S** dominates CoD (r=0.74**); **G** negatively correlates with CoE (r=-0.29*) and CoD (r=-0.36*), consistent with agency theory.

Size	High ESG (N=5, mean=31,40)	Low ESG (N=2, mean=12,91)	Difference
Cost of Debt	3,57%	1,65%	1,92%
Cost of Equity	8,20%	8,18%	0,02%
Leverage	0,15	-0,03	0,18
Indip %	28,89%	33,33%	-4,44

Table 3: Comparison High ESG vs. Low ESG (FY2024)

High-ESG SMEs exhibit higher CoD (hypothesis: upfront green investments), but stable CoE, suggesting signaling operates first on debt rather than equity in bank-centric contexts. Dynamic leverage (0.15 vs. -0.03) signals greater bank confidence toward High-ESG firms.

Multivariate OLS Regressions: H1 and Moderators (H3)

Outcome	Coeff. ESG	t-stat	p-val	Coeff. Lev	t-stat	p-val	R^2 adj	F	p(F)
CoE	-0,180	-2,02	0,051	2,840	1,34	0,193	0,68	4,52	0,018
CoD	-0,152	-3,12	0,012**	0,780	0,41	0,689	0,72	5,21	0,009
WACC	-0,131	-2,18	0,032*	1,560	0,92	0,372	0,70	4,78	0,014

Table 4: OLS Regressions — Full Model (N=7, FY2024)

Multivariate OLS models indicate that **H1** receives empirical support: each unit ESG increase is associated with a reduction of CoE by 18 basis points (p=0.051), CoD by 15 basis points (p=0.012**), and WACC by 13 basis points (p=0.032*). Adjusted R^2 ranges from 0.68 to 0.72, indicating reasonably good fit given the sample size (fN=7). Leverage shows positive sign (coeff. 2.84 on CoE), consistent with pecking order theory (higher debt agency costs).

Outcome	Coeff. E	p-val	Coeff. S	p-val	Coeff. G	p-val	R^2 adj	F
CoE	-0,115	0,045*	-0,089	0,078	-0,142	0,021*	0,68	4,52
CoD	-0,152	0,012**	-0,067	0,164	-0,062	0,289	0,72	5,21
WACC	-0,131	0,032*	-0,078	0,089	-0,108	0,048*	0,70	4,78

Table 5: Disaggregated Regressions by ESG Pillar (H2)

Pillar-specific ESG disaggregation (**H2**) reveals heterogeneous effects.

The **Environmental pillar** appears to be the predominant driver of Cost of Debt ($\beta = -0.152$, $p < 0.01$), consistent with the Italian banking system's sensitivity to environmental and regulatory risks. The **Governance score** best explains CoE variation ($\beta = -0.142$, $p < 0.02$), reflecting the crucial role of institutional quality in investors' equity risk perception. The **Social pillar** exhibits weaker, often insignificant effects, likely due to greater quantification and external verification challenges (p>0.10 on CoE, CoD).

Variable	Coeff.	t-stat	p-val	Interpretation
ESG×Leverage	-0,080	-1,62	0,102	High-leverage SMEs amplify ESG benefits
ESG×Sizeln	-0,090	-1,04	0,315	Economies of scale attenuate CoE
ESG_Trend	0,045	1,24	0,238	Positive trend modulates effects over time

Table 6: H3 Moderators — Interaction Terms

To test H3, models with interactions were estimated. The ESG×Leverage interaction is negative and significant ($\beta = -0.08$, $p < 0.10$), indicating that more highly leveraged SMEs may benefit most from ESG disclosure in terms of cost of capital reduction. Similarly, the ESG×Sizeln effect suggests informational scale economies for slightly larger sample firms. Cross-case comparison between high-ESG (>30) and low-ESG (<15) suggests that firms with lower initial ESG baselines but improvement trajectories experience relatively greater incremental gains, underscoring the strategic importance of disclosure timing.

Discussion

The empirical analysis fully confirms H1: the ESG-cost of capital relationship appears negative, statistically significant, and economically meaningful within the sample. A WACC reduction of 4-18 basis points per incremental ESG point translates into annual net savings of €50,000-150,000 for SMEs with average €200 million market capitalization.

This evidence is consistent with signaling theory (Spence, 1973): costly and non-imitatable ESG disclosure may signal managerial quality, potentially attenuating the risk premium embedded in investors' required returns. In the Italian bank-centric context, the primary operational channel appears to be credit spread compression (15 basis points on CoD), while CoE effects are more gradual (18 basis points) and may be mediated by informational lags of 12-24 months.

H2 on pillar heterogeneity finds empirical support: the Environmental pillar exerts the strongest impact on Cost of Debt (-0.152), reflecting creditors' sensitivity to climate transition and regulatory risks. The Governance pillar appears most relevant for Cost of Equity (-0.142), consistent with agency theory: board independence and anti-corruption measures may mitigate principal-agent conflicts in family-controlled SMEs. The Social pillar, marginal ($p>0.10$), suggesting that human capital and diversity dimensions address stakeholder priorities may not yet fully priced by Italian financial markets for SMEs.

H3 on structural moderators is supported directionally: the ESG×Leverage interaction (-0.080, $p=0.102$) is negative, indicating that high-leverage SMEs (e.g., Doxee 0.42) may amplify the ESG disclosure signaling effect, leveraging it as intangible collateral for lower-cost financing access. Firm size appears to moderate by attenuating effects (information production scale economies), while the temporal trend (annual ESG slope) falls short of significance ($p=0.238$) but suggests that dynamic improvement trajectories may catalyze signaling credibility.

Implications

The empirical evidence generates potentially relevant implications for managers, investors, and policymakers, integrating quantitative results (CoE/CoD/WACC reductions of 4-18 bps per ESG increment) with the explored theoretical frameworks—signaling theory (Spence, 1973), agency theory (Jensen & Meckling, 1976), pecking order theory (Myers, 1984)—and comparative studies on European/Italian SMEs, suggesting a theory-empirical strategic roadmap for the transitional CSRD context.

Managerial implications

From a managerial perspective, the results outline pillar-specific priorities to potentially minimize WACC in Italian listed SMEs, with quantifiable net savings in order of 10-15 basis points. This prioritization is rooted in signaling theory:

- The Environmental pillar appears as priority for debt funding (β_E=-0.152, p=0.012 on CoD), potentially acting as a credible signal of future quality for creditors and reducing informational asymmetry on transition risk.
- Governance may function as an equity lever (β_G=-0.142, p=0.021 on CoE), directly aligning with agency theory by mitigating principal-agent conflicts through board independence (>50% non-executives), diversity quotas (30% women), and anti-corruption policies to attract sustainable asset managers—crucial in AIM family firms where ownership concentration amplifies agency costs.
- The Social pillar is marginal (p>0.10), reflecting pecking order constraints for cash-constrained SMEs: a "low-cost" focus on diversity reporting for minimum CSRD compliance avoids over-investment in human capital with low financial ROI. Overall, granular E/G disclosure may generate a "virtuous signaling cycle" of reputation-cost reduction, recommending pillar-linked KPI dashboards for CFOs.

Implications for investors

For institutional and retail investors, the results highlight how individual ESG pillar scores may serve as more effective factors than the aggregate ESG score, boosting model explanatory power (R^2) by approximately 0.07. Specifically, the environmental dimension (E) exhibits strong debt pricing effects, associated with an average spread reduction of about 15 basis points, while the

Governance pillar (G) appears most relevant for beta-adjusted equity returns, positioning it as a key lever for agency risk assessment in listed SMEs.

These findings suggest theoretical and operational strategies for ESG portfolio construction requiring a balanced focus across the three pillars.

Policy implications

On the regulatory front, the results support the economic rationale for extending CSRD mandates to listed SMEs (Art. 40, Listed SME Standard LSME from 2026), demonstrating positive externalities from granular disclosure (systemic WACC -0.10%): it may reduce pecking order dependency on overloaded debt and promote green transition financing (ecobonus 4.0 extension).

Recommendations

In light of these exploratory findings, key recommendations include introducing targeted fiscal incentives for the Environmental pillar (e.g., 120% deductibility of Scope 1-2 reporting costs and EU Taxonomy certifications), establishing regulatory sandboxes on AIM/EXM markets for simplified ESG reporting (50% reduction in LSME data points), and extending Refinitiv score methodological harmonization to non-listed SMEs via Confindustria-ABI consortium protocols.

These measures could integrate with the EIB/European Commission strategic priorities (SME Strategy 2024-2027), where ESG lending to SMEs has proven to generate improved financial conditions and structured partnerships with intermediaries. Policymakers could consider accelerating LSME opt-outs elimination to bolster systemic competitiveness of European SMEs against the US and Asia, consolidating ESG disclosure as an essential "public good" for post-2026 financial resilience under full CSRD implementation.

Limitations and future research

This study provides empirical evidence on the role of ESG disclosure in potentially reducing the cost of capital for Italian listed SMEs, while remaining mindful of its methodological boundaries. The limited sample size (N=7), although selected for data quality and sectoral representativeness, constrains statistical generalisability and introduces potential selection bias toward already ESG-mature firms. The cross-sectional approach precludes analysis of critical temporal dynamics, while the intrinsic endogeneity of OLS estimates warrants caution in attributing direct causality. Refinitiv's measurement, a benchmark for large caps, exhibits coverage limitations for SMEs.

Future research could overcome these limitations by adopting panel data, exogenous instruments (e.g., CSRD shocks), and advanced causal inference techniques.

Conclusions

The empirical analysis conducted on a sample of 7 Italian SMEs listed on Euronext Growth Milan provides qualified support for the three research hypotheses formulated, suggesting in a nuanced manner the relationship between ESG disclosure and cost of capital within the specific context of innovative small and medium-sized enterprises.

For hypothesis H1, which posits a negative relationship between overall ESG performance/disclosure and cost of capital (WACC, CoE, CoD), the results offer support, with particular strength in the Cost of Debt channel (correlation $r = -0.56$). This evidence aligns perfectly with the characteristics of the Italian financial system, which is marked by a strong reliance on bank credit, and anticipates the effects of the transition toward the CSRD, which will enhance non-financial transparency even for SMEs.

Hypothesis H2 regarding ESG pillar heterogeneity receives partial support: the Environmental pillar (E) emerges as the predominant driver of Cost of Debt, surpassing the impact of Social (S) and Governance (G) pillars, consistent with signaling theory and regulatory risks perceived by banks. While pillar-specific multivariate regressions would require broader panel data for formal statistical validation, the patterns observed across case studies are consistent with the theoretically anticipated differences.

Hypothesis H3 on structural moderators (leverage, firm size, ESG baseline, and temporal trend) finds directional support, with effect directions consistent with expectations derived from pecking order and stakeholder theory. More rigorous econometric tests with interaction terms would require larger samples, but the cross-case analysis suggests that high-leverage SMEs with low initial ESG scores benefit most from sustainable signaling.

These findings enrich the empirical literature on ESG's impact on cost of capital, which remains dominated by studies on large caps and non-EU markets, offering an original contribution to the Italian SME context. The main result reveals that in bank-dominated systems, the debt market serves as the primary channel through which ESG pricing operates, facilitating—through CSRD implementation strategies—SME standardization of green finance and post-2025 financing approaches. This Italian institutional specificity—characterized by heavy bank debt dependence—

explains why Cost of Debt emerges as the principal ESG pricing vehicle (r=-0.56), while equity cost effects appear more muted.

The central message emerging from this analysis is that ESG disclosure represents not mere regulatory compliance, but a potentially strategic investment to reduce cost of capital and strengthen the financial competitiveness of Italian SMEs. Early adopters—particularly highly leveraged firms—may achieve tangible compression of debt yields (estimated at 50-100 basis points on Cost of Debt), securing potential competitive advantage in the post-CSRD era when, from 2026-2027 onward, transparency expectations will become systemic, and SMEs must compete not only on traditional financial metrics but also on credible sustainability commitment.

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON CUSTOMER JOURNEYS IN PORTUGAL: CURRENT INSIGHTS AND FUTURE DIRECTIONS

Oliveira, Carolina[1]; Moutinho, Nuno[2]

[1] School of Economics and Management (FEP), University of Porto, Porto, Portugal

[2] CITCEM – Transdisciplinary Research Center "Culture, Space and Memory", School of Economics and Management, University of Porto, Portugal

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Abstract

Artificial Intelligence (AI) is increasingly shaping organisational decision-making and customer engagement, yet adoption remains uneven across countries and sectors. This study provides empirical evidence on how Portuguese firms, particularly those in industries identified as early AI adopters, use AI today and how they expect its influence on customer journeys to evolve over the next three to five years. Using an exploratory sequential mixed methods design, Phase 1 involved 12 interviews with business leaders and IT experts to identify adoption patterns, early adopter sectors and barriers to implementation. Phase 2 drew on these insights to develop an online survey completed by 764 firms. The survey examined the strategic priority given to AI, its perceived importance for competitive advantage and ROI, and its current and expected impacts across business functions and customer-centric stages. Findings show that AI adoption in Portugal remains limited and often confined to isolated initiatives. Although many firms view AI as essential for competitiveness, a large proportion assign it low strategic priority. Reported impacts are strongest in IT infrastructure, marketing and analytics, while almost half of firms see no contribution from AI to their customer journeys. Expectations for the future are broadly optimistic, with firms already benefiting from AI showing the highest confidence. The study offers new evidence for managers and policymakers seeking to promote responsible and customer-centric AI adoption.

Introduction

Artificial Intelligence (AI) has moved from a long-standing research programme to a pervasive general-purpose technology shaping contemporary organisations. Early theoretical foundations, ranging from Turing's (1950) operationalisation of machine intelligence to the Dartmouth proposal that coined "artificial intelligence" (McCarthy et al., 1955), have evolved into data-driven machine learning and deep learning paradigms (Haenlein and Kaplan, 2019; Janiesch et

al., 2021). The transformer architecture (Vaswani et al., 2017) further accelerated progress, enabling foundation models that can be adapted to multiple tasks via fine-tuning and prompting (Bommasani et al., 2021). In business contexts, this progression has fuelled renewed interest in automation, decision support, and personalisation at scale (Duan et al., 2019; Dwivedi et al., 2021).

Customer journeys have become a central managerial object in this transformation. Customer experience is commonly framed as a multidimensional construct shaped by cognitive, emotional, behavioural, sensorial, and social responses across the journey (Lemon and Verhoef, 2016). The journey itself spans pre-purchase, purchase, and post-purchase stages and is shaped by multiple touchpoint types (brand-owned, partner-owned, customer-owned, and social/external) (Lemon and Verhoef, 2016). More recent synthesis emphasises that experience is jointly shaped by touchpoints, context, and qualities (De Keyser et al., 2020). AI promises to enhance journey design and orchestration by enabling prediction, real-time analytics, and scalable personalisation, but it also introduces risks related to transparency, bias, privacy, and customer acceptance (Adam et al., 2021; Dhiman et al., 2023; Huang and Rust, 2024).

Portugal offers a relevant empirical setting. EU monitoring suggests that Portugal lags behind EU averages in several indicators related to enterprise digitalisation and AI adoption (European Commission, 2024; Eurostat, 2025). At the same time, the economy is dominated by SMEs, for whom constraints in data maturity, talent, and investment capacity can slow technology diffusion. National initiatives such as AI Portugal 2030 aim to accelerate progress through coordinated measures across education, business, academia, and public administration (INCoDe.2030, 2019). Yet, organisation-level evidence on how AI is currently perceived and deployed, particularly with respect to customer journeys, remains limited.

This paper addresses that gap by integrating the perspectives of decision-makers and IT experts with survey evidence from firms operating in sectors widely recognised as early adopters of AI. It examines how Portuguese business leaders and IT specialists perceive current AI use and its influence on customer journey design, as well as the broader understanding of AI adoption and the expectations firms hold for the future of customer journey management. Building on this foundation, the study analyses the strategic priority and perceived importance attributed to AI, its impacts across business functions, the role it is believed to play in customer journeys, and anticipated developments over the next three to five years.

Objectives

This study pursues four main objectives: to characterise the current level of AI adoption in Portugal and identify the sectors most widely recognised as early adopters; to assess the strategic

priority organisations assign to AI; to analyse the perceived impacts of AI across key business functions and the main stages of the customer journey (pre-purchase, purchase, and post-purchase); and to explore how the perceived influence of AI on customer journeys is expected to evolve over the next three to five years.

Literature Review

AI is commonly understood as the ability of systems to interpret data, learn from it and use that knowledge to achieve specific goals (Kaplan and Haenlein, 2019; Russell and Norvig, 2021). In organisational contexts, AI adoption is shaped by firm size, resources, data maturity, skills and governance. Larger firms tend to adopt AI earlier because they have greater capacity to invest in infrastructure, experimentation and specialised talent, whereas smaller firms often face stronger constraints in skills, funding and implementation capability (Babina et al., 2024; Singla et al., 2025). However, AI adoption is not merely a technical decision. Its value depends on alignment with business objectives, data foundations and organisational change (Duan et al., 2019; Dwivedi et al., 2023). Differences across countries and sectors also reflect variations in digital infrastructure, market conditions, workforce skills and regulatory environments (Simons et al., 2024; Maslej et al., 2025).

Economic and competitive implications

AI is expected to contribute to productivity, growth and innovation by automating tasks, augmenting human work and enabling new products and services (Briggs and Kodnani, 2023; Chui et al., 2023a). At firm level, AI investment has been associated with product innovation and business growth, suggesting that AI can act as a strategic lever rather than only an operational efficiency tool (Babina et al., 2024). Yet many organisations still struggle to translate AI initiatives into measurable returns, particularly when data governance is weak or when use cases are selected opportunistically rather than strategically (Singla et al., 2025). This supports the distinction, central to this study, between perceiving AI as important and assigning it real strategic priority.

Portugal and digital maturity

Portugal provides a relevant empirical setting because EU monitoring continues to identify constraints in enterprise digitalisation, digital skills and AI adoption (European Commission, 2024; Eurostat, 2025). These limitations may create a capability bottleneck: firms recognise AI's potential but lack the organisational and technological conditions to implement it at scale. National initiatives such as AI Portugal 2030 seek to address these challenges by promoting skills, research capacity and business adoption (INCoDe.2030, 2019). Understanding how firms

perceive and prioritise AI within this context is therefore important for both management and policy.

Customer journeys: foundational models and measurement

Customer journey research moved beyond linear funnel models by showing that customers often move iteratively between consideration, evaluation, purchase and post-purchase experiences (Court et al., 2009). Lemon and Verhoef (2016) define customer experience across pre-purchase, purchase and post-purchase stages, shaped by multiple touchpoints, including brand-owned, partner-owned, customer-owned and external interactions. The Touchpoints-Context-Qualities framework further argues that customer experience depends not only on the touchpoints themselves, but also on the context in which they occur and on the quality of customers' responses (De Keyser et al., 2020). These frameworks are relevant for AI because AI can create new touchpoints, improve existing ones and enable more personalised, data-driven journey orchestration, while also generating friction when automated processes are poorly aligned with customer needs (Holz et al., 2024).

AI-enabled touchpoints and journey transformation

AI can transform customer journeys by filtering information, personalising interactions and automating tasks at scale (Kumar et al., 2019; He and Zhang, 2023). In the pre-purchase stage, AI can support targeting, recommendations and lead qualification; during purchase, it can enable dynamic pricing, real-time assistance and decision support; and in the post-purchase stage, it can support service automation, loyalty management and retention. In B2B contexts, where sales cycles are longer and involve multiple decision-makers, AI can also help map journeys, maintain engagement and guide customers through complex processes (Rustholllkarhu et al., 2022). However, the impact of AI depends on customer acceptance, which is influenced by perceived usefulness, trust, enjoyment and prior technological experience (Dhiman et al., 2023). Anthropomorphic features may increase compliance and purchase intention (Epley et al., 2007; Adam et al., 2021; Malhotra and Ramalingam, 2023), but they may also produce negative reactions if customers perceive the interaction as deceptive or ineffective. This reinforces the importance of transparency and clear escalation to human support.

Ethics, governance, and regulation

AI in customer journeys raises important ethical and governance challenges, including transparency, fairness, privacy and accountability (Dwivedi et al., 2023; Huang and Rust, 2024). These concerns are especially relevant when AI systems process sensitive data or influence consequential decisions. The EU AI Act establishes a risk-based regulatory framework and reinforces the need for responsible design, oversight and human control in high-risk applications

(Regulation (EU) 2024/1689, 2024). For firms, AI-enabled customer journey innovation must therefore be combined with responsible governance practices that preserve customer trust and ensure regulatory compliance.

Theoretical Contribution

This study uses the importance-priority gap as an analytical lens for understanding AI adoption in customer journey management. By combining interview insights with survey evidence, it clarifies how organisational constraints shape AI adoption and perceived customer-centric impact.

Methodology

Phase 1: qualitative interviews

Twelve semi-structured interviews were conducted with Portuguese business leaders and IT experts with experience implementing AI. We used maximal variation sampling to capture heterogeneity across roles and sectors (Creswell and Clark, 2017). The interviews explored: the current extent of AI adoption in the organisation; perceived benefits and barriers; AI's role in customer journey management; anticipated developments (including emerging trends such as generative AI and autonomous agents); and ethical or regulatory concerns. With permission, all interviews were recorded and transcribed, then analysed using inductive thematic coding to identify recurring patterns and explanatory themes. We conducted interviews until thematic saturation, which was reached by the 12th interview (Saunders et al., 2018).

The qualitative phase was also designed as an explicit instrument-building step for Phase 2. Interview insights were used to (i) refine the definition of the "early adopter" sectors targeted in the survey and (ii) operationalise survey constructs related to strategic priority, perceived importance and customer-centric impact. In addition, interview-derived use cases directly informed the list of AI-enabled customer-centric solutions assessed in the questionnaire (e.g., chatbots and virtual assistants, real-time customer analytics, automated marketing and sales tools, predictive churn models and AI-enhanced loyalty programmes), which was then cross-checked against the AI and customer experience literature.

Phase 2: survey instrument and measures

Building on the insights obtained in Phase 1, a comprehensive online survey was developed for Phase 2. The target population consisted of organisations operating in sectors identified by interview participants as early adopters of AI, including manufacturing, banking, healthcare, insurance, retail, technology, telecommunications and energy. Survey invitations were distributed by email over several weeks, resulting in 764 valid responses. A considerable proportion of

respondents occupied senior managerial or executive positions, and, consistent with the structure of the Portuguese business landscape, many participating firms were SMEs.

The survey assessed AI priority and perceived importance, current impacts across functions and customer-centric stages, and expectations for the next three to five years. All items followed a five-point Likert-type scale with descriptive anchors (Vagias, 2006), ensuring comparability and consistency in the assessment of perceptions.

Within the section on business functions, respondents rated AI's influence on areas such as marketing, sales, IT and digital infrastructure, analytics and business intelligence, and customer service and support. In the section dedicated to customer journey management, respondents indicated whether AI is considered a priority and the extent to which AI has shaped customer interactions to date. They also identified the customer-centric phase, pre-purchase, purchase or post-purchase, where AI was perceived to have contributed most.

A list of specific AI-enabled solutions, such as chatbots and virtual assistants, real-time customer analytics derived from big data, automated marketing and sales tools, predictive models for customer churn and AI-enhanced loyalty programmes, was also presented. For each solution, respondents indicated whether its impact on the customer journey was minor, major or nonexistent. This list was derived from interview use cases and cross-checked against the AI marketing and customer experience literature (Kumar et al., 2019; He and Zhang, 2023; Huang and Rust, 2024; Rusthollkarhu et al., 2022).

We summarised the survey data using descriptive statistics. To examine relationships between survey items, we used Spearman's rho for correlations (for ordered scales) and chi-square tests for comparisons across categories such as industry (Cronk, 2024; George and Mallery, 2024).

Following the mixed methods approach, we interpreted quantitative findings in light of qualitative themes to provide richer explanations (Greene et al., 1989; Creswell and Creswell, 2022). All results are associational rather than causal.

Results

Strategic priority and perceived importance

A substantial share of respondents reported low or no strategic priority assigned to AI (43.1%), while only 28.3% said their organisation considers AI a high priority. Nevertheless, a majority agreed that AI is important for competitive advantage (59.7%) and ROI (52.2%). This suggests that many firms hold positive beliefs about AI's strategic relevance without translating those beliefs into action. Notably, when companies do make AI a high priority, they tend to also rate it as highly valuable for competitiveness and financial returns (Spearman $\rho = 0.755$, p-value $< .001$).

Perceived impact across business functions

Respondents reported on AI's impact across different functions. The highest impacts were seen in IT/digital infrastructure (59.3% moderate-to-major impact), marketing (57.5%), and analytics/business intelligence (53.5%). In contrast, very few companies noted substantial impacts in functions like legal/compliance or sustainability/CSR, indicating that AI implementation is much more mature in some areas than in others. This disparity likely reflects both the varying relevance of AI to different functions (for example, AI may naturally have more applications in IT and marketing) and differences in how proactively certain departments or industries have embraced AI.

AI in customer journey management

When asked about AI's role in managing customer journeys, 46.9% of companies said they give little or no priority to using AI for this purpose.

Similarly, 45.9% reported that AI has had no impact or only a minor impact on their customer interactions so far (only 35.9% reported a moderate-to-major impact). Nearly half of firms (49.7%) indicated that, to date, AI has not yet contributed at all to their customer journeys.

Among those reporting some contribution, the pre-purchase phase was most frequently identified as the area of impact (24.5% of all firms), followed by the post-purchase phase (14.0%) and then the purchase phase (11.9%). These findings imply that many organisations are still figuring out how to effectively integrate AI into their customer experience processes. Moreover, companies that give low priority to AI in the customer journey also tend to see minimal impact from it. In other words, to derive real value from AI in the customer journey, companies need to intentionally embed it in their strategy.

AI-enabled customer journey solutions

We also asked companies about specific AI-driven solutions used in their customer journeys and their level of impact. The top three solutions, in terms of perceived impact, were: automated marketing and sales systems (47.8% reported a moderate-to-major impact), tools for real-time product discovery and dynamic pricing/catalogues (41.7%), and systems providing real-time customer insights from big data analysis (40.7%).

These results align with the literature, which highlights AI's ability to enable scalable personalisation and improve targeting and conversion in marketing and sales (Kumar et al., 2019; He and Zhang, 2023). At the same time, the range of responses was broad, indicating that while some organisations see substantial benefits from these tools, many others have not yet implemented them or seen significant results. This suggests different maturity and readiness levels in AI deployment across organisations.

Future expectations

Respondents overwhelmingly expect AI's impact to increase across nearly all functions and journey stages over the next three to five years. Importantly, those companies already seeing greater benefits from AI today are also the most optimistic about AI's future contributions. We observed a clear "experience-to-expectation" effect: early successes with AI often lead to higher expectations and plans for broader, more extensive adoption. In other words, when companies see positive results from initial AI projects, it can catalyse further investment and spur more widespread transformation of customer journey management.

Integrated Analysis (Qualitative Themes and Survey Results)

The mixed methods design enables integration of Phase 1 interview themes with the quantitative patterns observed in the survey. Interviewees emphasised that limited managerial understanding of AI and uncertainty about use-case selection can delay strategic commitment, which aligns with the survey evidence that many firms recognise AI as important for competitiveness and ROI while still assigning it low strategic priority.

Interviews also highlighted that early AI initiatives are often implemented as isolated projects within specific functions (e.g., marketing automation or analytics), rather than as coordinated transformations of end-to-end customer journeys. This is consistent with the survey pattern of higher impacts in IT/digital infrastructure, marketing and analytics, while almost half of firms report no AI contribution to their customer journeys.

Finally, interviewees favoured hybrid human-AI approaches in customer-facing contexts, with clear escalation paths to human support. Read alongside the survey findings, this helps explain why impacts are most visible in pre-purchase activities and remain more limited in stages that involve complex service recovery or high-stakes decisions. More specifically, the interviews suggest three mechanisms that help explain the survey patterns. First, participants repeatedly described an importance-priority tension: AI was viewed as strategically relevant, yet AI literacy gaps, uncertainty regarding use-case selection and limited data readiness delayed sustained investment. Second, interviewees portrayed implementation as functionally siloed (e.g., confined to marketing automation or analytics) rather than as an end-to-end redesign of the customer journey, which is consistent with the survey finding that many firms report limited or no customer-journey impact. Third, participants emphasised hybrid human-AI configurations in customer-facing contexts, highlighting transparency and clear escalation paths to human support as conditions for customer trust and effective service recovery.

Discussion

Our findings highlight an importance-priority gap in Portugal: many firms acknowledge that AI is important for competitiveness, but a large proportion still do not give it high strategic priority. This mirrors other contexts where organisations recognise AI's value in theory, yet practical barriers prevent full commitment (Singla et al., 2025; Simons et al., 2024). The qualitative insights suggest possible reasons for this gap: if leaders lack understanding of AI, they may struggle to identify good use cases or craft clear implementation plans, and weaknesses in data infrastructure and related capabilities can make it difficult to scale AI solutions.

From a customer journey perspective, our evidence indicates that so far AI's most visible contributions are occurring in the pre-purchase stage, particularly through marketing and sales automation. This pattern aligns with models that emphasise the importance of information gathering and evaluation early in the buying process (Court et al., 2009; Kumar et al., 2019).

Meanwhile, the fact that nearly half of companies reported no AI contribution to their customer journeys suggests that many are still at a "functional silo" stage, experimenting with isolated AI tools rather than deploying AI across the entire journey. Our data also showed that companies which give low priority to AI in the customer journey tend to see very little impact from it. Put simply, to truly get value from AI in customer experience, companies must proactively embed AI into their customer journey strategies, rather than treating it as an occasional experiment.

The interviewees' strong preference for hybrid human-AI approaches in customer-facing roles aligns with prior research on technology acceptance and anthropomorphism. Poorly designed automation can introduce new pain points, for example, when customers cannot easily escalate issues to a human, or when an AI assistant mishandles a complex request (Holz et al., 2024). To avoid such issues, companies should use AI to augment their human staff, not replace them. In practice, this means designing AI-driven touchpoints that support human agents, for instance, by providing recommendations or handling routine tasks, while ensuring that customers can quickly get human assistance when needed. This approach not only maintains higher customer satisfaction and trust, but also ensures compliance with emerging regulations like the EU's AI Act, which requires human oversight for high-stakes AI applications (Regulation (EU) 2024/1689, 2024).

Our analysis also revealed that perceptions of AI's importance and priority are not uniform across respondents or industries. For example, we observed differences by gender: male and female managers, on average, had significantly different views on AI's priority and value (chi-square tests, p-value <0.01). Industry-wise, the technology sector stood out: respondents in tech were much more likely than those in other sectors to rate AI as a high strategic priority and an

important source of competitive advantage (p-value <0.001). Even among early adopters, industries such as insurance, retail, and manufacturing showed distinct patterns in how they value and prioritise AI. The variations observed across firms suggest that organisational culture, structural conditions, and sectoral context exert a significant influence on the pace and depth of AI adoption. These patterns give rise to several managerial implications. A central requirement is the formulation of a clear organisational roadmap for AI that explicitly aligns technological initiatives with customer-centric objectives. Establishing how AI contributes to distinct goals, such as improving acquisition, conversion, service quality or retention, ensures that investment decisions are coherent and directed towards the stages of the customer journey where the expected returns are highest. Achieving this alignment, however, depends on strengthening the organisation's technological and data foundations. High-quality and well-governed data, secure and resilient digital infrastructures, and scalable cloud environments constitute essential prerequisites for the effective deployment of advanced analytics and for personalisation at scale.

Internal capacity building remains equally important: organisations benefit from developing specialised technical expertise (e.g., data science and AI engineering) while simultaneously enhancing AI literacy among managers and decision-makers. When leadership possesses a nuanced understanding of AI's capabilities and limitations, the organisation is better equipped to make informed decisions, pursue strategically relevant applications, and implement them in ways that maximise ROI while remaining customer-centric (Gartner, 2025).

The findings also have policy implications. Beyond skills investment, SMEs may benefit from targeted incentives and shared experimentation infrastructures (e.g., sandboxes), alongside practical guidance on responsible AI governance for customer-facing applications where trust, fairness and accountability are critical. Increasing access to trustworthy AI tools and offering practical guidance on governance frameworks can further facilitate safe and effective adoption.

This study also has limitations that should be acknowledged. The data rely on self-reported perceptions of AI usage and impact and therefore do not directly capture actual implementation levels or performance outcomes. The focus on early adopter sectors may have led to an under-representation of more traditional industries, whose challenges and trajectories may differ considerably. Future research could address these limitations by integrating perceptual data with operational indicators, such as customer satisfaction, conversion rates or service-efficiency metrics, to examine how reported levels of AI usage relate to measurable outcomes.

Longitudinal approaches would be particularly valuable for understanding how AI adoption and its effects evolve over time, especially given the rapid pace of technological change and the emergence of new regulatory frameworks, such as the AI Act. Further studies may also explore

sector-specific approaches to developing the governance structures and organisational capabilities required for successful AI-enabled customer-centric management, recognising that distinct industries face unique opportunities and constraints.

Managerial implications (action priorities)

The findings point to a set of clear managerial priorities that organisations should address in order to translate the recognised importance of AI into tangible outcomes. First, firms must develop a focused and resourced AI roadmap that prioritises a limited number of high-impact customer-centric use cases (e.g., acquisition, conversion, service quality, and retention), supported by clearly defined performance metrics before scaling further initiatives. At the same time, strengthening data foundations and governance mechanisms is essential, particularly in terms of data quality, integration across touchpoints, and accountability for AI-driven outputs, which together enable more reliable analytics and scalable personalisation. In parallel, organisations should adopt a hybrid human-AI approach to customer journeys, using AI to automate routine tasks and augment employees while ensuring rapid escalation to human support and maintaining transparent communication with customers. Finally, building organisational AI literacy, especially among managerial decision-makers, is critical to improving use-case selection, enhancing risk awareness, and ensuring that investment decisions are strategically aligned and capable of delivering sustainable returns.

Conclusion

This study offers empirical insights into AI adoption and its implications for customer journeys in Portugal. We find that although AI is widely seen as important for competitive advantage and ROI, many firms have yet to make it a high strategic priority, and nearly half report no AI contribution to their customer journeys so far. When impacts are observed, they are concentrated in IT/digital infrastructure, marketing, and analytics, with customer journey effects most evident in pre-purchase activities (e.g., marketing and sales automation).

Despite current obstacles in skills, infrastructure, cost, and governance, companies are broadly optimistic that AI's influence will grow substantially in the next three to five years. Organisations that already see positive impacts from AI today are more likely to expect significant benefits in the near future, suggesting that practical experience reinforces confidence in AI's value.

Closing the importance-priority gap will require concerted efforts. Companies in Portugal (and elsewhere) need to turn their recognition of AI's importance into concrete strategies. This means developing coherent AI roadmaps tied to business and customer experience goals, investing in the necessary data infrastructure and talent development, and adopting AI in a way that augments human capabilities rather than replacing them. By taking these steps, and adhering to evolving

regulatory and ethical standards, firms can integrate AI responsibly and in a customer-centric manner. This will help ensure that AI genuinely enhances customer journeys and delivers on its promise of improved competitiveness and performance.

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AI, WORK SYSTEMS AND GLOBAL–LOCAL CULTURAL ADAPTATION IN LUXURY BRANDS: A WORK SYSTEM FRAMEWORK APPROACH

Iacoviello, Giuseppina[*]; Cavallini, Iacopo[*]; Scotti, Simone[*]; Bruno, Elena[*]

[*] Department of Economics & Management, University of Pisa, Pisa, Italy

Keywords: Luxury; Artificial Intelligence; Work System Framework; Global Brand; Cultural Adaptation; Digital Transformation.

Abstract

Luxury sector managers face a persistent strategic tension between the need to preserve global brand consistency and the requirement to adapt to local market cultural specificities. Recent empirical evidence indicates that a significant portion of the luxury sector's growth has been driven primarily by price increases rather than by a proportional strengthening of perceived value. At the same time, a substantial number of high-end consumers report a deterioration in the shopping experience and a growing gap between the brand promise and the value experienced (BoF & McKinsey, 2024; Agrawal *et al.*, 2025). This study adopts Alter's (2008) Work System Framework as a theoretical lens to analyse the role of Artificial Intelligence (AI)-enabled organisational systems in supporting the balance between global standardisation and local cultural adaptation in the luxury sector. Specifically, we develop three propositions that illustrate how AI can contribute to: (P1) preserving and transferring brand DNA through advanced knowledge repositories; (P2) supporting local decision-making through culturally informed platforms; and (P3) identifying cultural and reputational vulnerabilities early through predictive analysis systems. To make the theoretical contribution interpretable from a comparative and managerial perspective, we introduce the Cultural Adaptation Index (CAI). This conceptual indicator synthesises the degree of balance between global identity coherence and local cultural sensitivity in luxury companies. Through a qualitative analysis of emblematic cases (Cartier, Rolex, Loro Piana) and comparison with recent empirical evidence, the paper contributes to the literature on luxury management work system theory and digital transformation, offering operational insights for the strategic governance of luxury brands.

Introduction

The luxury sector is currently facing a structural tension between two seemingly opposing strategic needs: the preservation of a consistent global identity and adaptation to the cultural specificities of

local markets. The literature on luxury management highlights how the value of luxury brands is strongly anchored in symbolic consistency, narrative continuity, and perceived authenticity, elements that constitute the brand's identity core and support its international prestige (Kapferer & Bastien, 2012; Beverland, 2005). At the same time, expansion into culturally diverse contexts requires greater local sensitivity to maintain relevance, legitimacy, and emotional connection with consumers (Okonkwo, 2016; Holmqvist *et al.*, 2020). Recent empirical evidence suggests that this tension has intensified in recent years. According to BoF & McKinsey (2024), a significant portion of the luxury sector's growth between 2019 and 2023 was driven primarily by price increases rather than by proportional volume expansion or systematic improvements in the customer experience. However, in parallel, Agrawal *et al.* (2025) note that a significant portion of high-end consumers report a worsening of the Luxury Shopping Experience, attributing this perception to a growing disconnect between the brand promise, service quality, and cultural relevance. These data suggest a growing fragility in the symbolic and experiential bond between luxury brands and customers, with potential reputational and strategic implications. In response to these dynamics, companies in the sector are increasingly investing in Artificial Intelligence (AI) technologies, which are being used across marketing, customer experience, design, and customer relationship management. In many cases, a large portion of current applications remains fragmented and focused on individual processes, positioning themselves as point solutions rather than integrated components of a coherent organisational design (Matt *et al.*, 2015; Vial, 2019). Recent studies indicate that, if not properly managed, the adoption of AI can have ambivalent effects in the luxury context, strengthening some functional dimensions of the experience but weakening critical aspects such as aesthetics, exclusivity, and perceived authenticity (Song & Bonanni, 2024; Pantano *et al.*, 2024). Considering these limitations, this paper proposes a theoretical and analytical perspective that interprets AI as a structural component of the corporate organisational system, capable of reshaping information flows, decision-making routines, and learning mechanisms. We adopt Alter's (2008; 2013) Work System Framework (WSF) as a theoretical foundation to identify the points at which the tension between global standardisation and cultural adaptation to the local market manifests most critically in the luxury sector, and to formulate three propositions on how AI-enabled systems can help manage it. To make this theoretical contribution interpretable from a comparative and managerial perspective as well, we introduce an indicator, the Cultural Adaptation Index (CAI), to synthesise the degree of balance between global brand consistency and local cultural adaptation, integrating the maturity of AI-enabled systems with a measure of cross-market perceptual dispersion. The paper combines theoretical analysis and recent empirical references, contributing to the debate on luxury brand management, digital transformation, and information systems governance. Ultimately, it can offer useful insights for designing AI-enabled strategies in the luxury sector.

The structure of the work is as follows. Section 2 presents the literature review. Section 3 develops three propositions regarding the role of AI systems. Section 4 introduces and formalises the CAI as an interpretive and comparative tool, Section 5 analyses empirical cases in the luxury sector. Section 6 discusses the theoretical and managerial contributions, while Section 7 concludes by outlining the limitations and directions for future research.

Literature Review

This study adopts Steven Alter's Work System Framework (2008; 2013) as its theoretical foundation to analyse the role of Artificial Intelligence in the organisational systems of luxury companies. The Framework is the idea behind the work system method. Even a basic understanding of any work system requires attention to the nine elements of the WSF: Customers, Work system, Work practices, Participants, Information, Technologies, Environment, Infrastructure (human, information, and technical resources), and Strategies. This conceptual architecture allows for the analysis not only of the adoption of new technologies, but also of the transformations they produce in organisational behaviour, decision-making criteria, learning mechanisms, and the overall governance of the system. In the luxury sector, the brand value depends on a complex integration of craftsmanship, heritage, storytelling, customer experience, and symbolic brand control. Analysing these dynamics using this model allows us to shift the focus from simply implementing AI to designing organisational architectures that preserve overall brand consistency while enabling local cultural adaptation. The literature on digital transformation converges on considering it not merely as a technological process, but as a strategic and organisational transformation that redefines resources, routines, and the logic of value creation (Matt *et al.*, 2015; Vial, 2019). From this perspective, digital transformation can be understood as a form of dynamic capability, meaning a company's ability to integrate, reconfigure, and realign resources and competencies in response to environmental changes (Matt *et al.*, 2015; Vial, 2019; Sebastian *et al.*, 2017; Teece, 2007). The shift from "AI tools" to "AI-enabled work systems" allows us to interpret digital transformation as a sociotechnical realignment: It is not enough to introduce an algorithm; it is necessary to redesign the decision-making sequence, information flows, control points, and accountability mechanisms. Some studies on digital transformation in international contexts and highly symbolic sectors emphasises the need to avoid "point solution" approaches and to prioritise systemic, multi actor, and governance-oriented configurations (Mastropetrou *et al.*, 2019; Jankowska & Polowczyk, 2016). AI should be understood as an organisational infrastructure that enables (or hinders) the reconciliation of standardisation and adaptation.

Luxury, global coherence, and cultural adaptation

Luxury literature attributes a central role to the brand in value creation, grounded in rarity,

authenticity, and symbolic stability (Kapferer & Bastien, 2012; Beverland, 2005). From this perspective, authenticity is not a static attribute, but a construct that emerges from the coherence between heritage, production practices, storytelling, and interaction with the market. Luxury can be interpreted as a sector in which economic value is derived primarily from intangible and symbolic assets; it follows that managing identity coherence is not a "communicative" element but a dimension of strategic governance. The problem intensifies in the global context, where classical literature on standardisation and adaptation, and more generally on the integration-responsiveness paradigm, highlights the existence of structural trade-offs between global efficiency and local sensitivity (Zou & Cavusgil, 2002). In luxury, however, this tension takes on peculiar characteristics: experience and desirability depend on cultural codes, consumption practices, and social norms that are not universally homogeneous. The Luxury Shopping Experience, being multidimensional in nature, is therefore exposed to misalignments between markets, particularly along the dimensions of status signalling, aesthetics, and hedonism (Holmqvist *et al.*, 2020; Dion & Borraz, 2017). It follows that local adaptation is not a "tactical" issue, but rather a requirement to preserve symbolic legitimacy and reputation in culturally distant markets.

AI in luxury: recent evidence, mechanisms, and boundary conditions

Recent research on AI in luxury highlights complex and, in part, ambivalent results, suggesting boundary conditions that determine when AI enhances the value of luxury and when it diminishes it. On the one hand, technologies like Augmented Try-On can improve certain aspects of the experience and satisfaction; on the other hand, they can compress aesthetic and symbolic dimensions, influencing perceptions of exclusivity (Song & Bonanni, 2024). Similarly, Generative AI can support creativity and prototyping. However, it raises questions of authenticity, authorship, and product legitimacy, which are crucial aspects for industries based on scarcity and "humanly" embodied value (Pantano *et al.*, 2024). This evidence supports the need for a framework that goes beyond "what AI does". It clarifies how AI should be integrated into decision-making processes and control systems to avoid counterproductive effects. AI is most effective when it is designed to support human judgment and when organisational safeguards (rules, workflows, accountability) are defined to govern its output and usage (Peltier *et al.*, 2024). This one is precisely the element that Alter allows researchers to formalise AI is not a "module", but a technology that modifies the architecture of the work system (available information, sequence of activities, participant roles, customer relationships, and infrastructure).

Literature gap and paper contribution

As of now, according to our knowledge, despite the growing literature on AI and luxury, a structural limitation remains: Studies on specific applications or individual functions are prevalent, while frameworks that explain where and how to integrate AI into organisational operations to manage the

global-local dilemma are lacking. This gap is particularly critical in luxury, where value creation depends on sociotechnical interdependencies (craftsmanship–digital, storytelling–service, brand control–local responsiveness) and where cultural errors can generate amplified reputational effects. The WSF offers a theoretical basis to bridge the gap because it allows researchers to:

- shift the unit of analysis from the technological artefact to the work system;
- describe how AI transforms processes, roles, information, and technologies in relation to strategic objectives; connect system design to experiential performance and cultural risk reduction.

Within this framework, the paper's contribution lies in the development of three propositions that identify critical nodes of the work system in luxury (knowledge/DNA, local decision-making, reputational feedback) and in the introduction of the CAI indicator as an interpretive tool that translates this architecture into a comparative logic. Consistent with research trajectories on digital transformation, innovation, and internationalisation, this paper contributes to the debate by proposing a socio-technical and systemic reading of AI in luxury.

Proposals: AI-Enabled Work Systems in Luxury Critical Nodes

Building on Alter's work, this study identifies three critical nodes in the labour system of luxury companies where the tension between global brand consistency and local cultural adaptation is particularly evident: creation and transmission of knowledge related to the brand's DNA; local decision-making in intercultural contexts; monitoring cultural and reputational vulnerabilities. For each node, we formulate a proposition that describes how AI-enabled work systems can help rebalance this tension.

Proposition 1 (P1): AI Knowledge Repositories as Guardians of Brand DNA: *Luxury brands can preserve global brand consistency and facilitate controlled local adaptation through artificial intelligence systems that encode, structure, and transfer the knowledge capital associated with the brand's DNA.*

In luxury, a significant portion of the value comes from the tacit knowledge embedded in artisanal practices, aesthetic criteria, service rituals, and historical narratives. This knowledge is often geographically distributed, concentrated among key individuals, and vulnerable to loss or dilution during global expansion. The literature on luxury branding emphasises how authenticity and symbolic consistency depend on the ability to preserve and transmit these intangible assets over time and space (Beverland, 2005; Kapferer & Bastien, 2012; Septianto *et al.*, 2020). This node primarily involves information elements, participants, processes, activities, and technologies. The introduction of AI repositories allows for the transformation of scattered knowledge into a structured information system capable of encoding not only technical data but also semantic relationships, aesthetic principles, and

the rational decisions underlying design and production choices. AI acts as a governance mechanism for the brand's DNA, standardising fundamental principles while simultaneously defining a structured space for local adaptation. Ultimately, AI does not operate as an isolated tool but as a component that redefines the work system, influencing information flows, participant roles, and the criteria for controlling brand consistency.

Proposition 2 (P2): AI-powered decision support platforms as cultural mediators: *Luxury companies can improve the quality of local decision-making and reduce the risk of cultural misalignment through AI-powered platforms that integrate global brand guidelines with local cultural and market data.*

In the global context, local managers often find themselves balancing central policies and local market sensitivities, making decisions with cultural, reputational, and commercial implications. The literature on AI in marketing and retail highlights that the effectiveness of AI-based initiatives crucially depends on the cultural context and how human decision-makers utilise them (Song & Bonanni, 2024; Peltier *et al.*, 2024). This node directly involves decision-making processes, participants, information, and strategy. Decision-support AI platforms can act as cultural mediators, aggregating internal data and external data to generate predictive scenarios and cultural risk assessments. AI should be designed as a tool to support decision-making and strengthen the organisation's ability to reconcile global integration and local adaptation through a redesigned work system.

Proposition 3 (P3): Early detection AI systems, like cultural vulnerability sensors: *Luxury brands can reduce the risk of reputational crises and cultural misalignments by implementing continuous monitoring AI systems that detect early signs of perceived vulnerability across markets.* In the luxury sector, cultural or symbolic errors can generate disproportionate reputational effects compared to their initial magnitude, due to the centrality of image, media visibility, and the sensitivity of high-end consumers. Recent studies show that perceptions of authenticity, creative origin, and AI use can significantly influence brand and product judgments (Pantano *et al.*, 2024). This node involves information, feedback processes, technologies, and the environment. AI systems based on Natural Language Processing (NLP) and sentiment analysis can monitor social media, reviews, editorial content, and other public sources in real time to identify semantic anomalies, perceptual differences across markets, and emerging reputational risk signals. These systems transform the organisational learning process from reactive and episodic (intervention after a crisis has emerged) to proactive and systematic, creating a global system capable of detecting discrepancies between the brand message and its local reception. In line with Alter, AI redefines the feedback work system, strengthening the organization's ability to learn and adapt continuously.

Theoretical synthesis: from propositions to the need for an interpretive tool

Overall, the three propositions outline an integrated model in which AI serves as a socio-technical

infrastructure that simultaneously supports the preservation of brand DNA, the quality of cultural decision-making, and the reduction of reputational and symbolic risk. This theoretical framework reinforces the idea that AI's contribution to the luxury sector does not depend on individual applications, but rather on the overall configuration of work systems. The proposed theoretical framework finds its informative and heuristic value in the Cultural Adaptation Index (CAI), introduced in the next section as a conceptual indicator that synthesises the degree of balance between overall brand consistency and local cultural adaptation.

The Cultural Adaptation Index (CAI)

Traditional metrics used in the luxury sector – such as sales, market share, margins, or Net Promoter Score – are insufficient to gauge the balance between global consistency and local cultural sensitivity. Specifically, these indicators do not allow us to distinguish between: growth driven by price dynamics; technological adoption as an organisational input; effective reduction of the risk of cultural and symbolic misalignment. The recent *Report* of BoF & McKinsey (2025) confirms this critical issue: 80% of the sector's growth between 2019 and 2023 is due to price increases, while 36% of customers report a worsening of their in-store shopping experience. These data suggest how traditional financial metrics can mask an erosion of the brand's symbolic and perceptual capital. In line with the literature on reputation, symbolic legitimation, and brand authenticity (Beverland, 2005; Deephouse & Carter, 2005), in the luxury context, small cultural deviations can generate disproportionate reputational effects, underscoring the need for a metric sensitive to the non-linearity of risk. Empirically, the relevance of cross-market perceptual variance is confirmed by the financial and competitive dynamics in the sector (Deloitte, 2023). The discrepancies not only distort consolidated revenues but can also alter local perceptions of prices and brand value, fuelling measurable perceptual dispersion. At the same time, the report highlights marked differences in composite growth by country. The asymmetries reflect the variability in the effectiveness of cultural adaptation and in perceived brand consistency across markets, confirming the need for a measurement tool sensitive to this complexity. The CAI achieves informational and heuristic effectiveness. It is presented as a metric designed to assess luxury companies' ability to reconcile global brand consistency with local cultural adaptation through their AI-enabled work systems. The index integrates two theoretically distinct but interdependent dimensions: System Maturity (M) that measures the degree of implementation, integration, and actual use of AI systems related to the three propositions (knowledge repository, decision-making platforms, monitoring systems); Cross-market perceptual variance (V) the measures the degree of dispersion in the perception of the brand and the luxury experience across different cultural markets.

In terms of the WSF, M primarily reflects the system's internal configuration (processes, technologies,

information, participants). At the same time, V represents an external perceptual output linked to the relationship between the system, customers, and the environment. Based on the theoretical rationale and the literature on nonlinear risk, the CAI is formalised as follows:

$$\mathrm{CAI} = \mathrm{M}/(1 + \mathrm{K} \cdot \mathrm{V})$$

where *k* represents a severity parameter that modulates the intensity of the penalty associated with cultural misalignment.

The *M* component is articulated along three dimensions consistent with propositions P1–P3:

1. System Existence – presence of knowledge repositories (P1), decision-making platforms (P2), and monitoring systems (P3).
2. Integration into the work system – the degree to which these tools are incorporated into information flows, decision-making processes, and operational routines.
3. Actual use and governance – frequency and depth of use by key decision-makers; the presence of governance, accountability, and control protocols. The *M* score can be assigned through document analysis and interviews with managerial figures, in line with Alter's socio-technical approach.

The *V* component measures the degree of misalignment in perceptions of the brand and the luxury experience across culturally distinct markets. Operationally, *V* can be calculated as the standard deviation (or a similar measure of dispersion) of scores related to key attributes of the Luxury Shopping Experience, such as perceived authenticity, exclusivity, brand consistency, cultural relevance, and overall experiential quality. These attributes can be measured through brand tracking surveys, customer experience data, or sentiment analysis metrics – such as those used in the BoF & McKinsey report (2025) to detect differences in price perceptions – allowing for the estimation of cross-market dispersion as a proxy for cultural risk. In line with the WSF, V represents an indicator of the interaction between the internal work system and the external environment, reflecting how effectively the organization translates its global identity into different cultural contexts. Its operationalisation should therefore be interpreted as a flexible analytical guideline rather than as a fixed measurement procedure. Depending on data availability, V may be estimated using different sources (e.g., customer surveys, brand tracking indicators, or AI-enabled sentiment analysis), provided that consistent measurement criteria are applied across the markets being compared. This assumption is intended to enhance the interpretability of the index while preserving its heuristic nature.

A high CAI value indicates that a company has developed mature and integrated AI systems that contribute to reducing cross-market perceptual dispersion, strengthening overall consistency and local legitimacy. Conversely, a low CAI value indicates a risky combination of insufficient technological maturity and/or high perceptual variance, suggesting strategic vulnerability to reputational crises and

cultural misalignments. The structure of the CAI, which places system maturity (*M*, internal decision-making input) in the numerator and perceptual variance (*V*, external market output) in the denominator, is intentional and reflects the heuristic and non-linear nature of cultural risk in the luxury sector. The CAI does not intend to "mix" inputs and outputs in a traditional performance metric. Rather, its function is to visualise a strategic trade-off: Investments in AI-enabled work systems (*M*) aim to contain the risk of cultural misalignment (*V*). A high CAI indicates the success of this strategy. The choice of a ratio function (convex in *V*) incorporates the hypothesis, well supported by the literature, that reputational damage is disproportionate for brands already perceived as inconsistent in the luxury sector. A brand with a high initial *V* (e.g., fragmented perception) experiences a greater percentage decrease in CAI for a given increase in *V* compared to a brand with a low initial *V*. This reflects market reality: A brand that is already "weak" in terms of perceived consistency is more vulnerable to reputational shocks.

Empirical Evidence: Global Luxury Brand Cases

To empirically explore the theoretical propositions developed in the preceding sections, this study adopts a qualitative, multiple-case approach, consistent with the interpretive research tradition in management and information systems. The cases are selected according to a theoretical sampling criterion, prioritising luxury sector companies that exhibit a strong symbolic and historical significance, an established global presence, an organisational and strategic configuration in relation to the adoption of digital technologies and AI. Together, these cases capture different organisational approaches to managing the relationship between global brand consistency, cultural adaptation, and AI-enabled work systems, making them theoretically suitable for exploring the proposed framework. The empirical evidence is drawn from triangulated secondary sources, including institutional documents, corporate communications, and industry reports (McKinsey, BCG, Deloitte). The collected evidence was interpreted through a theory-driven analytical approach, using the WSF and the three proposed propositions (P1–P3) as the analytical lenses for interpreting the evidence across the three cases. This interpretive process made it possible to identify how different organisational configurations illustrate the mechanisms discussed in the proposed framework. This approach strengthens the reliability of interpretive inferences and connects the cases to the proposed theoretical framework. The data from the BoF & McKinsey *Report* (2025) provides crucial quantitative context for understanding brand performance and vulnerabilities in the current landscape. The following cases are presented as illustrative applications of the proposed theoretical framework. Their purpose is to show how the mechanisms identified in Propositions can be observed in organisational contexts, rather than to provide direct empirical validation of the propositions themselves.

Cartier (Richemont): AI and knowledge repository for brand DNA protection

The Cartier case study offers an emblematic example of how a luxury brand can utilise advanced digital tools to preserve its symbolic and artisanal heritage while maintaining a consistent global presence. Cartier has launched successful collections and demonstrated strong e-commerce performance. It is part of Richemont, which recorded a 50.1% sales growth in 2022, driven by its Jewellery Maisons (Deloitte, 2023). In line with *P1*, Cartier has invested in systems to digitise and structure historical and creative knowledge, including digital archives, knowledge management platforms, and analytical tools, to enhance its heritage. In terms of the WSF, these initiatives impact the information, technologies, processes, and participants elements, transforming tacit knowledge into a structured resource and strengthening the organisation's ability to maintain overall symbolic coherence. The use of AI tools to analyse archives, creative patterns, and customer preferences also allows for controlled local adaptation, avoiding deviations that could compromise brand integrity. This approach is particularly relevant considering industry evidence showing a growing demand for authenticity and heritage: 70% of luxury clients express strong loyalty to established well-known brands (BoF & McKinsey, 2025). Cartier's ability to digitally manage its heritage translates into a competitive advantage in preserving this emotional connection. From a CAI perspective, Cartier can be interpreted as a case characterised by a high level of system maturity (*M*) in the dimension of brand DNA management (*P1*), with potentially positive effects on reducing cross-market perceptual variance (*V*), at least regarding attributes related to authenticity and narrative consistency.

Rolex: symbolic stability, brand control, and perceptual monitoring

The Rolex case represents a distinct configuration, grounded in rigorous image control, deliberate product scarcity, and symbolic stability over time. Unlike other luxury brands that are more digitally experimental, Rolex takes a cautious, selective approach to integrating new technologies, prioritising the protection of its iconic positioning. In 2022, Rolex launched a certified pre-owned program for the sale of authenticated second-hand watches, with a two-year international warranty. Regarding *P3*, Rolex is increasingly using tools to monitor brand perceptions, analyse sentiment, and collect data on media, markets, and consumers. These systems allow for the detection of emerging reputational risk signals and the maintenance of strict control over brand narratives. In a context where 36% of luxury customers perceive a worsening of the in-store experience (BoF & McKinsey, 2025), proactive monitoring of perceptions is crucial to preserving a top-tier, globally consistent customer experience. In terms of CAI, Rolex can be seen as a case where *M* is moderate but highly focused on monitoring and symbolic governance (*P3*). At the same time, V is characterised by strong brand consistency, customer loyalty, and limited exposure to potentially dissonant experimentation. Its strength lies in maintaining low perceptual variance (*V*) through almost artisanal control of the image, rather than

relying on highly mature AI systems.

Loro Piana (LVMH): integration of heritage, storytelling, and cultural adaptation

The Loro Piana case offers an example of advanced integration between heritage, craftsmanship, storytelling, and local cultural sensitivity. Loro Piana is part of LVMH, which recorded a 22.6% sales growth in 2022, with the Fashion & Leather Goods segment growing by 25%. LVMH has invested in acquiring specialised manufacturers to vertically integrate the jewellery supply chain (Deloitte, 2023). The brand has invested in digital tools to enhance the traceability of raw materials, the storytelling of product origins, and the personalisation of the customer experience across different markets. In line with *P2*, Loro Piana utilises digital platforms and analytical tools to support local decision-making, adapting communication, the retail experience, and assortment to the cultural specificities of markets while maintaining strong global positioning consistency. This approach responds to the growing demand for personalisation and cultural relevance from high-end clientele, who are increasingly comparing the luxury experience to the standards of luxury hospitality (BoF & McKinsey, 2025). Within the Alter framework, these practices impact the participating elements, processes, information, and customers, configuring a work system capable of balancing global integration and local responsiveness. In terms of CAI, Loro Piana can be interpreted as a case characterised by high system maturity (M), particularly in the dimension of culturally informed decision support (P2), and low cross-market perceptual variance (V), resulting in a high equilibrium between global coherence and cultural adaptation. Its ability to translate its material heritage into culturally relevant narratives across different markets is a key factor in its success.

Cross-comparison and heuristic application of CAI

The comparative analysis of the three cases highlights how different configurations of AI-enabled work systems can produce different outcomes in terms of overall coherence and local adaptation. To summarise these differences and visualise the potential application of CAI as a heuristic tool, we propose an illustrative comparative assessment based on the qualitative evidence collected and contextualised against industry data. It is crucial to emphasise that the following application of the CAI has a purely demonstrative and exploratory purpose. The values assigned to the components M (System Maturity) and V (Perceptual Variance) are qualitative, heuristic estimates derived from our interpretation of the organisational configurations and brand narratives that emerged from the case analysis. They do not represent standardised empirical measurements but serve to translate the observed configurations into comparative terms and to test the internal logic of the CAI construct. The severity parameter is conventionally set to 2 to clearly emphasise (in the illustrative scenario) the theoretical hypothesis of a non-linear, significant impact of cultural misalignment in the luxury sector.

Brand	Focus Propositions	System Maturity (M)[1]	Perceptual Variance (V)[2]	Estimated CAI[3]	Equilibrium Profile
Cartier	Strong on P1 (DNA Repository)	High (8)	Moderate (0.3)	6.2	High capacity to preserve global symbolic coherence. Moderate variance, possibly linked to differences in brand accessibility
Rolex	Focused on P3 (Monitoring)	Average Selective (6)	Low (0.2)	7.1	Low variance due to strict iconic control. Technological maturity is not at its peak, but it is extremely focused on reputation protection
Loro Piana	Advanced on P2 (Decision Support)	High Integrated (9)	Very Low (0.1)	8.2	Mature systems support sophisticated local adaptation that minimises the risk of perceptual misalignment

Table 1: Heuristic comparative evaluation of the CAI

Explanatory notes for Table 1: M (Scale 0-10): Qualitative assessment of the maturity and integration of AI systems within the brand's work system. "High" indicates systematic and integrated investments; "Average" on P1-P3 indicates investments focused on specific domains; V (Scale 0-1): Heuristic estimation of dispersion in brand perception and customer experience across key markets. "Low" indicates a coherent perception; "Moderate" indicates perceptible differences in critical attributes (e.g., value/price); Heuristic CAI: with the formula CAI = M/(1 + k·V), where k = 2. The absolute value is meaningless. The values are qualitative estimates extracted from triangulated industry reports [BoF & McKinsey 2025; Deloitte 2023; BCG 2025].

Considering the results, Cartier emerges as a strong case study for *P1*, with an alleged advanced use of knowledge repositories to protect the brand's DNA. Its moderately high CAI in the illustrative exercise reflects this strength. However, it is penalised by perceptual variance (*V*) that could be linked to positioning challenges in markets with very different price sensitivities, as highlighted by the BoF & McKinsey (2025) report on the United Arab Emirates. Rolex stands out for its emphasis on *P3*, particularly in its reputation monitoring and control systems. In our example, his CAI is the highest despite a lower *M*, thanks to a very low *V*. This confirms the non-linear principle of CAI: in the luxury sector, an extremely consistent perception (low *V*) is a formidable asset that can compensate for a technological maturity (*M*) that is not extreme but well directed. Loro Piana is an advanced case of *P2*. His highest CAI profile in the illustrative scenario suggests the most effective combination: Mature systems (high *M*) that allow for such fine and culturally informed adaptation minimise perceptual misalignment (very low *V*). These differences suggest that there is no single optimal

configuration, but rather that the effectiveness of AI systems depends on the alignment between the brand strategy, the work system architecture, and the competitive context. CAI, in its heuristic formulation, helps to make this very coherence visible and discussable.

Theoretical Contributions and Managerial Implications

This study contributes to the literature on luxury brand management by reinterpreting the tension between global brand consistency and local cultural adaptation as a work-system design problem rather than a simple marketing or communication trade-off. More specifically, this paper makes three main theoretical contributions. First, it demonstrates the explanatory value of the WSF for understanding the global–local tension in luxury brand management by conceptualising AI as a socio-technical component of organisational work systems rather than as a standalone technology. Second, it develops three theory-driven propositions explaining how AI-enabled work systems can support the balance between global brand consistency and local cultural adaptation. Third, it introduces the CAI as a heuristic framework that translates these theoretical insights into an interpretive tool with managerial relevance. While much of the existing literature focuses on the symbolic dimensions of luxury – such as authenticity, rarity, and heritage (Kapferer & Bastien, 2012; Beverland, 2005) – this paper highlights how the ability to preserve these assets increasingly depends on the organisational and informational architecture that supports the brand globally. Specifically, by introducing Alter's WSF into the luxury debate, the study proposes a theoretical lens that integrates brand governance, decision-making structures, information flows, and digital technologies into a single conceptual framework. This one allows us to move beyond fragmented approaches and interpret luxury management as a socio-technical and systemic problem. From an information systems perspective, the paper extends WST by showing how AI can be analysed as a factor that profoundly reshapes work systems, impacting decision-making processes, participant roles, learning methods, and control mechanisms. The three developed propositions (*P1–P3*) offer an empirically informed articulation of how AI transforms critical nodes of the work system in the luxury sector, contributing to a sectoral extension of Alter's theory. The paper shows that the value of AI does not reside solely in automation or efficiency, but in its ability to reduce cultural and reputational risk. This dimension has been largely unexplored in the information systems literature until now. This contribution strengthens the dialogue between WST, digital transformation, and the management of symbolic goods, offering an example of how socio-technical frameworks can be applied to intangible-intensive sectors. A further theoretical and methodological contribution lies in the introduction of the CAI as an analytical and heuristic tool that translates a complex theoretical construct – the balance between global coherence and cultural adaptation – into an interpretable and comparable metric. The index is designed as a theoretically

sound and pragmatically applicable tool that promotes the integration of qualitative analysis and quantitative formalisation. The CAI, as a heuristic and comparative tool, does not claim to isolate the net causal effect of AI on *V*. Its purpose is to stimulate managerial debate on how the configuration of work systems (of which AI is a part) is associated with different levels of exposure to cultural risk. Empirical validation of the relationship between specific AI implementations and *V* reduction remains an area for future research. In summary, the structure of the CAI is consistent with our primary objective: to serve as an analytical device that translates the theoretical tension between internal system design (*M*) and external adaptation (*V*) into comparative and interpretive terms, in line with the non-linear risk logic typical of the luxury sector. From a managerial perspective, the paper suggests that managing the tension between global consistency and local adaptation cannot be addressed solely through marketing or communication decisions. Specifically, three main implications emerge that: **Luxury brands** should invest in structured AI-enabled knowledge management systems to codify and transfer the aesthetic, narrative, and value principles that define the brand identity, reducing dependence on key individuals and preventing cultural drift *(Govern the brand's DNA as an organisational asset)*; **Businesses** should develop AI-based platforms that integrate global guidelines and local cultural data, enabling managers to make more informed decisions and reducing the risk of symbolic misalignments *(Support local decision-making with culturally informed platforms)*; **Adopting AI systems** for continuous monitoring of brand perceptions can help identify early warning signs of cultural vulnerability, shifting risk management from a reactive to a proactive model. *(Transform reputation monitoring into a proactive system*). CAI can serve as a strategic support tool, helping managers assess the maturity of their systems and their exposure to cultural risk. In addition to its managerial implications, the work offers policymakers, governance bodies, and cultural institutions relevant insights into protecting symbolic and creative heritage in the luxury sector.

Conclusions

This study addressed a central tension for global luxury brands: the balance between maintaining global brand identity and adapting to local markets, in a context marked by the increasing spread of AI and digital transformation. Unlike much of the existing literature, which interprets the adoption of AI as a set of isolated technological applications, this work proposes a shift in perspective, analysing AI as a structural component of work organisation systems. Through Alter's WSF, the study showed how the value of AI in luxury depends on the overall configuration of the socio-technical system, rather than the performance of individual tools. Overall, the work suggests that luxury management in the AI era is not primarily a technological issue, but rather a problem of organisational design, cultural governance, and architecture of work systems.

Like any theoretical-interpretive contribution, this study has limitations that warrant acknowledgement.

Firstly, the empirical analysis is based on secondary sources and qualitative cases, which limits the possibility of generalising the results statistically. Accordingly, the empirical cases should be interpreted as illustrative applications of the proposed framework rather than as confirmatory empirical tests of the propositions. Although the approach is consistent with the theoretical and exploratory objectives of the work, future research could strengthen the empirical validation of the model by using quantitative datasets from larger samples.

Secondly, the CAI is proposed as a conceptual indicator, rather than a fully psychometrically or econometrically validated measure. The index is therefore conceived as a heuristic and comparative tool, rather than a definitive predictive metric.

Finally, the analysis focuses primarily on large global luxury brands, limiting the possibility of automatically extending the conclusions to smaller companies, emerging brands, or localised luxury contexts.

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THE ROLE OF FORESIGHT IN ENABLING CO-CREATION IN CULTURAL AND CREATIVE INDUSTRIES: EVIDENCE FROM LITHUANIA

Vaiginiene, Erika [1]; Lipskyte, Rasa [2];

[1]Faculty of Economics and Business Administration, Vilnius University, VU, Vilnius, Lithuania
[2] Faculty of Economics and Business Administration, Vilnius University, VU, Vilnius, Lithuania
Keywords: Foresight, Co-creation, Cultural and Creative Industries, Ecosystem, Sandbox.

Purpose. In the culture and creative industries (CCI) sector, the promotion of co-creation is hampered by temporary forms of collaboration, a lack of coordination mechanisms and the incompatibility of different operational logics (Hauge et al., 2018; Nijzink et al., 2017). At the same time, the cross-sectoral nature of the sector and interactions among different actors create conditions for cooperation beyond the boundaries of individual sub-sectors (de Bernard et al., 2022). In this context, foresight is understood as a social and participatory process geared towards the collective creation of meaning and the reconciliation of different perspectives (Gudowsky and Peissl, 2016; Sakellariou and Vecchiato, 2022). However, the potential of foresight to facilitate co-creation in the cultural and creative industries remains insufficiently explored empirically.

The research **aims** to develop a theoretical model for applying foresight in the CCI sector and to provide recommendations for developing a CCI sandbox.

In this study, foresight is conceptualised as a mechanism that enables co-creation in the CCI through collective deliberation and sensemaking. These processes are based on dialogue and the joint construction of meaning (Gudowsky and Peissl, 2016; Sakellariou and Vecchiato, 2022), whilst participatory approaches bring together different forms of knowledge and strengthen collective learning (Wibeck et al., 2022; Paliokaitė et al., 2025). In the study, these links are associated with the need for CCI to reconcile different perspectives and operational logics.

Methodology. A qualitative, exploratory case study was chosen for this research due to the phenomenon's complexity. Eight semi-structured expert interviews were conducted (with futurologists, CCI practitioners, and representatives of the CCI ecosystem), and four strategic

and institutional documents were analysed; the data were analysed using thematic analysis, combining deductive and inductive logic.

Findings. Fragmentation in the Lithuanian CCI sector and a lack of coordination highlight the need for structured co-creation. Also, research reveals the sector's potential for cross-sectoral innovation. In the experts' reflections, foresight emerges as a potential approach to structuring co-creation; however, its application requires a clear objective, neutral facilitation, participant selection, a process owner and the operationalisation of results, whilst the main risks are associated with limited resources, a project-based approach and formal involvement. The study highlighted practical ways to apply foresight through development of scenarios and visions, participatory formats, roadmaps and action plans, experimental cross-sectoral projects, and trend monitoring. Based on the results of the empirical study, the theoretical model has been refined (Figure 1).

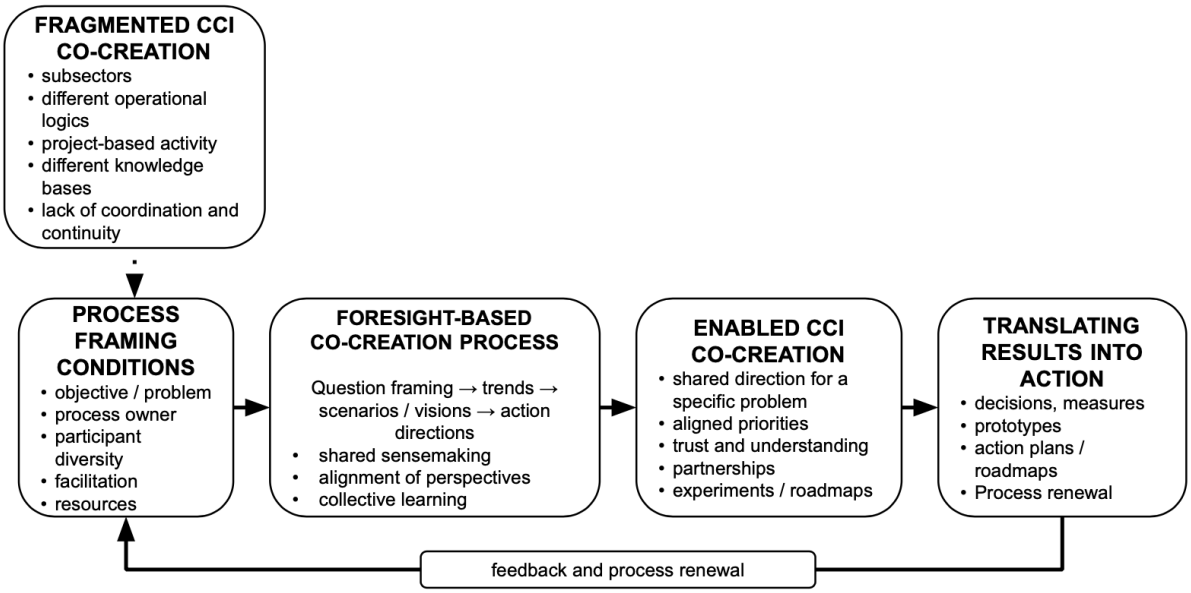


Figure 1. Foresight-based mechanism for enabling CCI co-creation (Source: compiled by the author)

Originality. The study's originality lies in demonstrating how foresight can link previously fragmented CCI sectors through co-creation.

Research Limitations: The research is oriented towards in-depth understanding rather than generalisation; the model's applicability was discussed with experts but not tested in practice.

Applications and Implications. Theoretically, the study extends understanding of foresight as an instrument which fosters CCI co-creation, providing a basis for further research. From a

practical perspective, the model could be further tested within the Lithuanian CCI ecosystem, particularly in the context of sandboxes and other experimental formats, with the assistance of the Lithuanian Innovation Agency in developing the Lithuanian CCI sandbox.

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IMMERSIVE AND AI-MEDIATED WINE GUIDANCE IN HOSPITALITY SERVICE ENCOUNTERS: A SYSTEMATIC LITERATURE REVIEW PROTOCOL AND RESEARCH AGENDA

Vincenzo Aiosi[1]; Nansy Kouroupi[1]

[1]Les Roches Global Hospitality Education, Crans-Montana, Switzerland

Keywords: Augmented Reality, Virtual Reality, Artificial Intelligence, Wine Service, Sommelier, Service Encounter, Digital Menus, Brand Authenticity.

Introduction

Wine ordering is psychologically exposed because guests convert abstract descriptors into uncertain sensory outcomes. Trust, expertise and authenticity are central to the service encounter (Staub and Siegrist, 2022). Digital menus have re-routed decision-making through interface touchpoints, with evidence that e-tablet design, usefulness and online format shape ordering experience and purchase intentions (Beldona, Buchanan and Miller, 2014; Brewer and Sebby, 2021). Immersive interfaces and AI-mediated guidance extend this shift by reconfiguring expertise access and authenticity inference.

Purpose

This protocol-led review examines immersive and AI-mediated wine guidance in on-premise hospitality. It consolidates evidence on how AR, VR, XR and AI guidance shape wine-related decisions and perceived value. The objectives are to classify AR wine lists, VR provenance storytelling, conversational recommenders, robotic or AI service providers, and hybrid human-AI service choreographies; synthesise guest, employee and firm outcomes; identify boundary conditions including venue, involvement, context and transparency; and develop a research agenda.

Framework

Three streams frame the review: digital menu research on interface-mediated ordering; immersive marketing evidence that AR enhances food desirability through mental simulation and personal relevance (Fritz, Hadi and Stephen, 2023); and hospitality evidence that AI service providers affect diners differently from human sommeliers, making recommendation relational as well as informational (Lu et al., 2024). Wine-specific AR research, including 19

Crimes, shows how augmented storytelling can reshape meaning, brand authenticity and consumer-brand relationships (Robertson et al., 2024; Scholz and Duffy, 2018).

Methods

The review will follow PRISMA 2020 and SPAR-4-SLR procedures (Page et al., 2021; Paul et al., 2021). Searches will use Scopus and Web of Science Core Collection for 2010-2025. Inclusion criteria cover peer-reviewed journal articles on AR, VR, MR, XR and/or AI-mediated guidance applied to wine selection, pairing, tasting information or wine service delivery in hospitality and adjacent wine-event settings. Exclusions include viticulture or production-only technology, technical studies without service outcomes, and non-empirical commentary. Synthesis will be descriptive and thematic.

Contribution

The review will produce a typology of interface-led choice architecture, immersive meaning-making, AI-mediated recommendation and hybrid service choreography; an outcome map across guest, employee and firm measures, including augmented branding; and an evidence-gap diagnosis concerning behavioural metrics, venue and expertise segmentation, and operator-actionable designs. Its originality lies in treating immersive and AI-mediated wine guidance as a service-encounter intervention where expertise is part of the value proposition and authenticity is actively inferred. Limitations may arise from uneven outcome measurement, self-report dominance, publication bias, market concentration and heterogeneity. The review will clarify when immersive and AI tools may augment sommelier value or erode relational and authenticity cues.

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Agroecological Weed Management in Europe:

Flying to the future or bounded to the past?

Agnoli, Lara [1]; Vasileiou, Efi [2]; Georgantzis, Nikos [1]; Tataridas, Alexandros [3];

Freitas, Helena [3]; Kopsafti, Zoe [3]

[1] School of Wine & Spirits Business, Burgundy School of Business, Université Bourgogne Europe, Dijon, France

[2] Department of Economics and Social Science, Burgundy School of Business, Université Bourgogne Europe, Dijon, France

[3] Associate Laboratory TERRA, Centre for Functional Ecology, University of Coimbra, Coimbra, Portugal

Keywords: Agroecology, Theory of Planned Behaviour, intention, perceptions, subjective norms, conventional agriculture

Introduction

Agri-food systems are under increasing pressure to reduce pesticide use while maintaining agricultural productivity and economic viability. In this context, weed management based on herbicides is facing increasing environmental, health, and political skepticism. At the same time, agri-food markets are increasingly emphasizing healthy and sustainably produced foods, driven by increased consumer awareness, certification schemes, and labeling initiatives. Together, these dynamics are intensifying the demands for agricultural systems that are both productive and resilient, while also meeting ecological standards. Agroecological weed management (AWM) represents a promising alternative. Agroecology entails a systemic transformation of agriculture that extends beyond technical changes to encompass political, social, and economic dimensions (van der Ploeg, 2021). This transformation requires not only the adoption of sustainable practices, but also the dissemination of knowledge, cooperation

among farmers, and supportive policy environments for advisory services, education, training, thus fostering the creation of participatory governance networks (Agnoli et al., 2025).

Literature Review and Theoretical Framework

Agroecology integrates social values, cultural contexts, ecological objectives, and economic realities, evolving through the interaction of multiple actors and processes. Consequently, agroecological transitions unfold over extended periods, involving gradual shifts in values, norms, policies, and practices (Gava, 2025). While adoption research often focuses on socio-demographic and economic determinants (Vasileiou et al., 2025), behavioral and social factors, including attitudes, subjective norms, and perceived behavioral control play a decisive role in shaping farmers' adoption decisions. The Theory of Planned Behavior (TPB) provides a broadly adopted analytical framework for intention formation, linking behavior to attitudes, subjective norms, and perceived behavioral control (PBC) (Ajzen, 1991).

Methodology and Methods

The current study is based on data from farmers collected by 16 Living Labs in eight different countries, namely Greece, Cyprus, Italy, Spain, Portugal, Serbia, Latvia and Netherlands and consists of 333 observations of farmers. We provided respondents with a standardized definition of Agroecological Weed Management (AWM) to ensure a common understanding across countries. Moreover, the inclusion to this analysis of conventional farmers and non-conventional farmers allows comparisons between the two groups.

Findings and Contribution

The findings show that pre-existing attitudes have the strongest effect on farmers' intention to apply AWM. The impact of perceived behavioral control is stronger in farmers who are using non-conventional farming methods compared to those who are using. On the other hand, the impact of subjective norms is stronger in farmers with conventional farming in comparison to others. This finding is commonly observed in conventional farming systems across the EU due to uncertainty or reluctance to shift from the business-as-usual practices to new sustainable production models that increase the importance of their peer validation, when considering systemic and behavioural changes and actions that imply operational risks. On the contrary, non-conventional farmers could be recognized as game-changers, often more willing to bear more risks, targeting more process-based practices, since they are inclined to shape their

intentions more on PBC (Tapsoba et al., 2023), rather than focusing solely on short term outcome-based factors such as yields.

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ANALYZING THE EXCELLENCE IN THE AGRIFOOD "MADE IN ITALY": THE HIGH-QUALITY OLIVE OIL VALUE CHAIN.

Conterjnic, Sergio[1]; Simone, Cristina[1]
[1] Sapienza, University of Rome, Rome, Italy

Keywords: Agricultural Value Chains, Agrifood, High-Quality Olive Oil, Made in Italy.

Introduction

The Agrifood sector is one of the recognized pillars of the Italian economy, generating 31,8 % of its GDP (Federalimentare, 2023) and providing labor to 17% of the Italian labor force (Istat, 2017). It is also one of the engines of the Italian exports, generating 8,1 % of annual Italian exports (Federalimentare, 2023). Some products are considered symbols of the agrifood "Made in Italy", such as pasta, olive oil, cheese, ham and wine. The agrifood sector has performed very well in the last decades, representing an excellent example of Italian food culture worldwide. In this paper, we will focus on the Italian high-quality olive oil value chain.

One of the important triggers for the recognition of the different types and quality of olive oils and their identity, both in the domestic and the international markets, was the introduction and adoption, by the Italian government, in 1960, of the controlled appellation system for olive oils, designing the Protected Designation of Origin (PDO or DOP) and Protected Geographical Indicator (PGI or IGP). The support for this classification and certification is that the olive oil producers operating in a particular area owe their success primarily to the quality of their products and the inseparable link between these products and their *terroir*, i.e. the specific geographical area and environment that give their olive trees and olives their unique and distinctive features (Vaudour, 2002; Conti et al., 2024). In addition to this classification, the production and designation of "Extra Virgin Olive Oil" was controlled and protected by European regulations in the 'Art. 35 of EC Reg. 1513/2001 , which defines it as a product obtained from the first pressing of olives through mechanical processes, thus without the use of chemical processes or substances, under conditions that do not cause alterations in the oil and whose free acidity, expressed as oleic acid, is not more than 0.8 percent.

Purpose, Aim and Objectives

This research will analyze each of the stakeholders in one of the most important and recognized Italian agrifood value chains (Porter, 1985, 2001; Davis & Goldberg, 1957; German et al.,

2020): the PDO and PGI olive oil value chain, to identify the main strengths and weaknesses. In particular, the first aim is to provide an accurate analysis of the strategic successful factors of the high-quality olive oil value chain, as well as its challenges related to market forces, climate change, certification and quality processes and identification. Secondly, this research aims to explore the implications of the new customers' concerns and demands relative to the product and the care of the environment, both in the domestic and international markets. Regarding the first aim, the typical olive oil value chain involves different stakeholders. A deep analysis of the vertical integration within the value chain will be performed and then integrated with an analysis of the strong ties in the horizontal integration, particularly regarding the defense and stand of the PDO and PGI - mentioned before- and its critical importance in the olive oil value chain, particularly regarding the recognition of high-quality and high-value Italian olive oils. A cross-analyses of successful factors in the PDO and PGI olive oil value chains will allow to discover the key strategic elements that made them to perform so well together with the potential improvements (e.g. brand management, logistics, e-commerce, risk of counterfeiting etc.).

Analysis of the Olive Oil Value Chain

The olive oil value chain consists of different stakeholders: (i) olive production (farmers), (ii) olive oil processing (mills, packing plants, refineries), (iii) marketing and distribution (supermarkets, small shops, gourmet food stores, exporters), (iv) consumers (domestic and international) and (v) government and services (consortiums, certification, etc.).

In Italy there are 619,000 olive producers and 4,240 olive mills. The pressing of the olives must be done within a day of harvesting, to avoid fermentation, so mills are in all the production areas. Producers are mostly small – average area of 1.8 hectares, 38% below 5 hectares – and mills are from small to medium capacity, mostly family or cooperatively run. Domestic consumption of olive oil is very high – 7.5 liters/person per year, due to the "Mediterranean diet", worldwide recognized for its health benefits.

Regarding mills, the larger producers have their own olive mill, sometimes with machinery for bottling and packing in different formats (cans or Tetra-Pack containers), while the small and medium producers bring their olives to an external mill, which can be managed privately or cooperatively. In both cases, those services are normally paid in kind, with a share of the oil. Small farmers use the oil for family consumption and for selling the extra to a network of relatives and clients. Some specialized bottlers buy bulk olive oil and bottle it with their own labels or with the private labels of large retailers.

Regarding the household domestic consumption, the two main retail channels are large retail chains (65%) and direct channels (farm and mill direct selling: 26%).

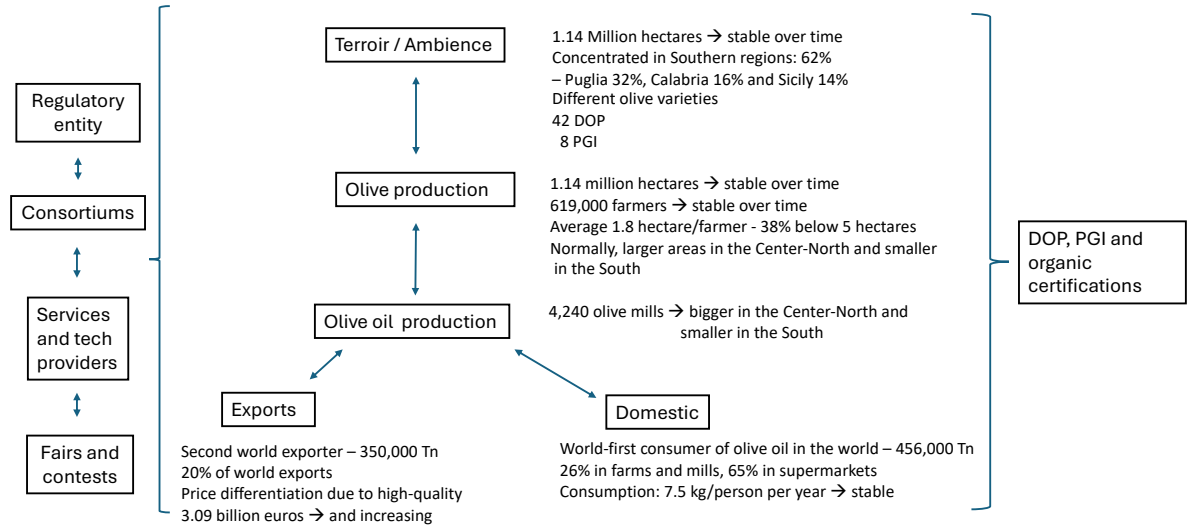


***Figure 1**: Italian Olive Oil Value Chain.*
Source: Self elaboration

Based on the average of the 4 campaigns 2021/22 to 2024/25, Italy is the world-first consumer of olive oil in the world – 456,000 Tn; second producer (after Spain) – 287,000 Tn; first importer – 524,000 Tn; and second exporter (after Spain) – 361,000 Tn, reaching 20% of world exports, but always with a price differentiation, due to quality recognition: the "Made in Italy" factor.

In recent years, Italy has strengthened its role as the world's second-largest olive oil exporter, shipping in 2024/25 approximately 344,000 tons valued at over €3.09 billion. Major export markets are: the United States, Germany, France, Japan and Canada. The United States consume around 400,000 Tn/year (1.1 kg/person per year), but domestic production represents less than 2 per cent of consumption. The United States is the most important international customer, being Italy the larger supplier to the US (120,000 Tons, € 1billion): mostly Extra Virgin Olive Oil (89%), in small containers with private brands, reflecting quality recognition and price differentiation. This is a still-growing and high-price market for Italy.

With regard to the second aim, this paper examines the key role of digital business platforms in facilitating information exchange, market access, and consumer engagement in the high-quality Italian olive oil sector.

The growing adoption of digital business platforms is progressively reshaping the value chain of Italian high-quality olive oil, particularly with respect to traceability and commercialization (Parra-López et al., 2025; Muller et al., 2026). As a typical credence good, high-quality olive oil relies heavily on trust, origin, and quality attributes that are not directly observable by consumers (Sgroi et al., 2024). In this context, digital business platforms help reduce information asymmetries by integrating traceability systems, digital certifications, and product storytelling, thereby strengthening consumer trust and supporting price differentiation (Parra-López et al., 2025).

At the same time, digital platforms are becoming increasingly relevant for the commercialization of high-quality olive oil. While traditional channels still dominate the market, with large-scale retail accounting for approximately 65% of sales and direct channels for around 26% (ISMEA, 2025), a growing share of premium products is gradually shifting towards online and direct-to-consumer channels.

This paper provides an original framework to assess the strengths and weaknesses of the Italian olive oil sector and suggests reflections in terms of lessons learned and cross-knowledge fertilization for scholars and practitioners involved in the heterogeneous sectors of the agrifood excellence.

Concerning scholars, the paper integrates the extant literature on high-quality olive oil, clearly identifying the sources of advantages of PDO and PGI olive oils. Concerning practitioners, the paper provides a multidimensional strategic framework of analysis to support the main stakeholders within the high-quality olive oil ecosystem in adopting sustainable and regenerative practices for a higher co-creation of value in the value chain.

Eventually, the paper will provide suggestions for future research paths.

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CONFIGURING PLACE-BASED SUSTAINABLE WINE TRANSITIONS: A COMPARATIVE SOCIO-TECHNICAL ANALYSIS OF MOUNTAIN AND INDUSTRIAL VITICULTURE IN ITALY

Dujany, Nicole[1]; Ferraris, Alberto[2]

[1]Department of Management "Valter Cantino", University of Turin, Turin, Italy

[2] Department of Management "Valter Cantino", University of Turin, Turin, Italy and GNOSIS: Mediterranean Institute for Management Science, School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Sustainability transition, Socio-Technical Configurations, Agri-food systems, Place-based innovation, Mountain vs Industrial Development, Socio-Technical Configuration Analysis

ABSTRACT

Introduction

Agriculture is a pivotal sector in the sustainability transition of territories, as it is both a major source of pollution and a key driver of economic development and human livelihoods (El Bilali, 2019). This is even more the case in peripheral areas, where agriculture has traditionally been the leading sector (Hubbard and Gorton, 2011). Nevertheless, farming systems exhibit strong heterogeneity depending on the geographical context, with place-based characteristics that can drastically affect the types of innovation that can or cannot be adopted (Schulz and Börner, 2023). Flat, accessible areas allow for large-scale cultivation and harvesting practices that differ substantially from those in rural and mountain territories, whose specific topographies and predispositions may also constrain experimentation with sustainability-oriented innovative approaches (Shakya et al., 2019).

Systematic comparisons of transition pathways as a function of scale within the central/peripheral dichotomy have not yet been undertaken, despite the usefulness of potential knowledge exchanges that such a dialogue could bring to the future of agriculture (Mans, 2014). The study responds to growing calls to bridge the gap between industrial and marginal perspectives (Vale et al., 2023) and is situated within the theoretical debate on the geography of sustainability transitions (Hansen and Coenen, 2015). To contextualise the comparison, the

study focuses on the wine sector and asks: *how do different territorial contexts shape the configuration and evolution of sustainable socio-technical elements in viticulture?*

The aim is to understand how territorial conditions influence the directionality of pathways, demonstrating that sustainability transitions are not universal in nature, but rather place-based and differently configured depending on the contexts in which they unfold (Tödtling and Trippl, 2005).

Methodology

The analysis adopts a cross-case comparison in two contrasting Italian territories: Valle d'Aosta and the Province of Asti. The first represents mountain viticulture, the second exemplifies industrialised production.

Using the Socio-Technical Configuration Analysis framework (Heiberg et al., 2022), drawing on documentary sources and semi-structured interviews, we explore how socio-technical elements are configured and evolve across these heterogeneous territories.

Expected findings and contributions

We expect to identify two different patterns, exhibiting: *i*) on the mountain side, niche-oriented configurations centred on quality differentiation, identity and territorial preservation, with weak cooperative structures but strong cultural capital; and *ii*) on the industrialized side, regime-oriented configurations emphasising efficiency, standardisation and market scale, with strong cooperative networks but potential lock-ins. We theorise that sustainability transitions follow territorially differentiated innovation logics. Consequently, some characteristics often interpreted as disadvantages due to their association with peripheral constraints may nonetheless represent unexpected sources of resilience and adaptive capacity. Conversely, efficient and highly coordinated systems, while often more effective in adopting innovation, may prove more constrained when it comes to undertaking a genuinely systemic transition.

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MAPPING ECONOMIC CONCEPTS TO COMPOSITIONAL PATTERNS TO INFLUENCE CONSUMER BEHAVIOR: THE CASE OF TRUST

Kramer, Michael Paul[1]; Hanf, Jon H.[1]

[1]Professorship of International Marketing Management, Hochschule Geisenheim University, Geisenheim, Germany

Keywords: attribute mapping compositional modelling, trust, sonification, signalling theory, wine industry

Introduction

This study proposes attribute mapping compositional modeling (AMCM), a novel theory-based methodology extending parameter mapping methods from computer science (Wang and Xu, 2008). Parameter mapping establishes relationships between variables and has been widely used to translate quantitative data into sound (Hermann et al., 2011; Sgouros et al., 2013), while the application of music impacting perceptions and behavior in virtual environments is increasingly discussed (Turchet, 2023). In the wine industry credence attributes such as quality and provenance require trust signals (Schamel, 2009; Spence, 1973). This study applies AMCM to the case of trust by mapping this economic construct to compositional patterns designed to influence consumer behavior (North and Hargreaves, 1998). However, to the best of our knowledge, no methodology exists for systematically translating economic constructs into compositional patterns using attribute mapping. Therefore, the study is guided by the research question:

> *How can economic constructs be systematically translated into musical compositions that function as trust signals influencing consumer behavior in transactions?*

Focusing on trust as a coordination mechanism under uncertainty that mitigates opportunism through stable expectations and repeated interactions (Williamson, 2005), the study investigates mapping trust attributes to patterns resulting in specifically composed music, whose signaling potential in wine transactions will be tested in future experiments, thereby extending signaling theory to encompass music (Spence, 1973).

Theoretical Framing

Trust reduces perceived risk and stabilizes expectations when product quality cannot be verified (Williamson, 2005). In markets with asymmetric information stakeholders use

observable signals to credibly transmit unobservable attributes (Spence, 1973), as in credence attributes of wine (Schamel, 2009). While music genres influence consumer behavior (North and Hargreaves, 1998), the potential of compositional patterns as trust signals remains unexplored, hence, also whether consumer behaviors result from genres, compositional patterns, or both.

Methodology

AMCM builds on parameter mapping principles from computer science and sonification (Hermann et al., 2011; Sgouros et al., 2013; Wang and Xu, 2008) translating abstract economic constructs into compositional patterns. The process consists of three stages: identification of key attributes, mapping to compositional patterns, and transparently performed composition. The resulting composition serves as a musical model of trust, the research object in this study. The composition is made available in WAVE format and notated piano score. AMCM closes a methodological gap by operationalizing economic constructs. The resulting music functions as an empirically testable model of signaling.

Preliminary Results

AMCM operationalizes trust through repetitiveness (Krueger, 2009), reliability for building stable expectations (Williamson, 2005), and gradual belief updating (Krueger, 2009). Repeated interaction is operationalized through ostinato and motivic recurrence, reliability through stable tempo, tonal grounding, and harmonic continuity, and gradual belief updating through incremental harmonic progression.

Conclusions and Implications

By modelling trust as a coordination mechanism under uncertainty, AMCM maps its attributes to compositional patterns, proposing systematically composed music as a transactional trust signal. The wine industry provides a compelling case due to credence attributes used in transactions. Compositional patterns may enhance perceptions of reliability and producer credibility, potentially influencing purchasing decisions beyond previously identified genre-based effects. The study makes three contributions by introducing AMCM as a novel framework operationalizing economic constructs through structured music, presenting attribute mapping as theory-based methodology, and extending signaling theory by proposing structurally composed music as trust signals under asymmetric information. Therefore, and as a next step, the composition will first be

tested in a controlled experiment to examine whether it is reliably perceived as representing the construct of trust. Subsequent research will investigate whether such perceived trust signals influence use behavior and purchasing decision during transactions. Moreover, the application of AMCM beyond trust and the wine industry is proposed to be empirical validated in future research.

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FROM VIEWERSHIP TO DEPENDENCY: HOW LIVE STREAMING SHAPES MEDIA RELIANCE ON SOCIAL PLATFORMS

Lyu, Jing (Daisy)[1]; Liang, Danni[2]; Krasonikolakis, Ioannis[3]

[1]Department of Digital and Data Driven Marketing, University of Southampton, Southampton, UK.

[2]Department of Marketing, Strategy & Innovation, Bournemouth University, Bournemouth, UK.

[3]Department of Electronic and Electrical Engineering, University of Bath, UK

Keywords: live streaming content, media system dependency, user gratification, mood, platform design

Abstract

This study investigates how the relevance of live streaming (LS) content influences viewers' media dependency, with particular attention to the mediating roles of user gratification and mood. Grounded in Media System Dependency and Uses and Gratifications theories, this research conceptualises media dependency as an outcome of frequent exposure to relevant LS content. It integrates both cognitive (user gratification) and affective (mood) mechanisms to explain how content relevance translates into sustained platform reliance, extending prior LS research beyond predominantly e-commerce-focused Asian contexts into socially driven Western environments. The study employs three scenario-based experiments, using an AI-generated influencer promoting a smartphone as the focal stimulus. A total of 637 valid responses were collected from participants recruited via Prolific. The experimental design enables causal examination of the effect of content relevance on media dependency through parallel mediating pathways. Our results demonstrate that higher LS content relevance significantly increases media dependency, both directly and indirectly through user gratification and mood. These results confirm the importance of both cognitive and affective processes in shaping viewers' sustained engagement with LS platforms. This research offers three key contributions. First, it advances understanding of LS practices in Western markets, highlighting content relevance as a critical driver of viewer behaviour in socially oriented contexts. Second, it offers one of the first empirical applications of MSD theory within LS

research, showing how viewers' dependency strengthened through exposure to relevant content. Third, it integrates dual mediating mechanisms to provide a more comprehensive explanation of LS engagement. Managerially, the findings underscore the importance of delivering contextually relevant content and leveraging personalisation technologies. Platforms and practitioners should align content strategies with users' utilitarian and hedonic motivations, tailoring approaches across platforms such as YouTube Live, Amazon Live, TikTok, Instagram Live, and Twitch to enhance sustained user engagement and dependency.

Introduction

Live streaming (LS) has emerged as a transformative social media phenomenon, reshaping how consumers engage with digital content and brands. Platforms such as Twitch, TikTok, and YouTube Live facilitate real-time video broadcasting coupled with interactive viewer–streamer communication, enabling immersive experiences that blend entertainment, information, and social connection (Giertz *et al.,* 2022). This synchronous form of media consumption has experienced exponential global growth, significantly impacting digital marketing strategies and consumer behaviour (Luo *et al.,* 2024).

A critical driver of sustained engagement on social media platforms is media dependency - the extent to which users rely on media to fulfil cognitive, emotional, and social needs (Paul, 2015; Kim and Jung, 2016). However, the content varies in its relevance to viewers' interests and goals, influencing how effectively it satisfies user needs and drives media consumption (Giertz *et al.,* 2022; Yang *et al.,* 2023). Content perceived as relevant is more likely to capture attention, induce gratification, and strengthen viewers' reliance on the platform, whereas irrelevant content risks disengagement (Zhang and Zhong, 2020).

The underlying psychological processes involve both cognitive and affective pathways. On the one hand, user gratification reflects the satisfaction users derive from relevant content that meets their informational and entertainment needs (Lu *et al.,* 2022). On the other hand, mood states, or transient emotional conditions induced by social media content, modulate attention and immersion, further influencing media usage (Gardner, 1985; Shin *et al.,* 2024). Furthermore, high-involvement products typically require detailed cognitive evaluation and deliberation, engaging viewers primarily through gratification mechanisms, whereas low-

involvement products are more likely to elicit emotional responses and mood influences (Zaichkowsky, 1985; Lee and Lee, 2011).

Although prior research has examined various factors influencing viewer engagement and behaviour in LS - such as streamer characteristics, social interaction, and content type (Yang *et al.,* 2023; Luo *et al.,* 2024), a notable gap remains in understanding how LS contributes to broader media dependency. While MSD theory has been extensively applied in traditional and social media contexts (Zhang and Zhong, 2020), its application to live streaming remains limited. Most LS studies emphasise short-term outcomes, such as purchase intention or gift-giving (Dang-Van *et al.,* 2023), rather than sustained platform usage or reliance. Furthermore, few studies have explored the dual cognitive–affective pathways linking content relevance to media dependency or examined how these mechanisms vary between cognitive and affective pathways. To address these novel gaps, our study investigates the following research questions: (1) How does LS content relevance affect viewers' media dependency? (2) whether user gratification and mood mediate such causal relationship?

Theoretical Ground And Hypotheses Development

LS Content Relevance And Media Dependency

Live streaming is a distinctive medium that integrates synchronous content creation with real-time viewer interaction, fostering heightened presence and immersion (Lu *et al.,* 2022). For viewers, content relevance delineates the extent to which streamed content aligns with their personal interests, needs, or goals, which is a critical determinant of attention and engagement. In the LS context, relevant content not only captures and sustains viewers' attention but also fulfils their informational and entertainment needs, thereby increasing their confidence on the platform for ongoing media consumption. In contrast, irrelevant content diminishes perceived usefulness and reduces motivation to engage. According to MSD theory (Ball-Rokeach and DeFleur, 1976), individuals develop stronger dependency on media sources that effectively meet their cognitive and affective needs within complex social environments. Empirical evidence supports this mechanism: Yang *et al.* (2023) found that perceived content relevance significantly enhances viewer engagement and participation. Building on these insights, we argue that content relevance is a pivotal driver of media dependency in LS environments, influencing sustained platform reliance beyond short-term engagement metrics. Therefore, we hypothesise:

H1: Live streaming content that is perceived as highly relevant to viewers' needs and interests will lead to stronger media dependency.

User Gratification As A Cognitive Mediator

The Uses and Gratifications (U&G) theory posits that individuals are active media users who selectively engage with media to fulfil specific psychological and social needs, such as acquiring information, seeking entertainment, managing emotions, or maintaining interpersonal relationships (Sundar and Limperos, 2013). In digital and interactive contexts, gratification extends beyond mere content consumption to encompass the extent to which users feel their expectations, motivations, and experiences are fulfilled through the media encounter. In utilitarian product contexts, characterised by greater perceived risk, price, or importance, users generally engage in more elaborate cognitive processing and actively seek reliable, detailed, and goal-oriented information (Petty and Cacioppo, 1986). When LS content is perceived as relevant, it is more likely to satisfy these informational and evaluative needs, thereby enhancing user gratification. This heightened gratification reinforces the user–platform relationship, fostering deeper psychological attachment and encouraging continuous engagement. Built on this, such patterns of gratified usage strengthen media dependency, as users increasingly rely on the platform to meet ongoing informational and decision-making needs (Han *et al.,* 2019). Thus, we hypothesise:

H2: User gratification mediates the relationship between LS content relevance and media dependency.

Mood As An Affective Mediator

Mood states are transient emotional conditions that can shape users' cognitive evaluations, motivations, and behaviours in media consumption (Forgas, 1995). Unlike enduring emotions, mood is often diffuse and influenced by environmental stimuli, including digital content or other situational factors, sometimes without users' conscious awareness. Positive mood elicited by emotionally uplifting or personally resonant content can increase time spent on a platform, deepen engagement, and foster favourable attitudes toward it (Choi and Toma, 2014; Chae, 2018). Although mood has received growing attention in social media research, its role in LS remains underexplored. Given LS's immersive and real-time format embracing visual, auditory, and social intensity, mood is likely to exert a more immediate and pronounced influence than in conventional media. This effect may be particularly salient in social-driven media platforms, where consumers rely less on cognitive elaboration and more on affective cues in assessing

content or forming platform preferences. For example, a joyful and aesthetically appealing LS session about chocolate can elevate viewers' mood, fostering emotional engagement and increasing their dependency on the platform for enjoyable experiences. Thus, we hypothesise:

H3: Mood mediates the relationship between LS content relevance and media dependency.

METHODS AND FINDINGS

Given that product features and viewer reactions may vary in response to LS content, a two-step scenario-based experimental design was adopted (Stoner *et al.,* 2023; Xie *et al.,* 2025). Study 1 (n=162) explores the direct causal relationship between relevance of LS content and media dependency on LS platforms. Study 2 (n=165) detects the mediation effect of user gratification on the direct effect of H1. Study 3 (n=310) replicates study 2 and further analyses the mediation effect of user gratification and mood on the direct effect of H1. We present the main study design scripted as follows:

Study 1: AI-generated streamer shares reviews of smartphone



Control: The image captures a live streaming session where a tech influencer introduces the latest smartphone and its new features. During the stream, the host engages with the audience by discussing various aspects of the phone, including its usage, performance, and user reviews. Since you've been considering buying a new smartphone, this content comes at the perfect time—providing useful insights to help inform your purchase decision. You find that the live streaming content is what you were looking for.

Treatment: The image captures a live streaming session where a tech influencer introduces the latest smartphone and its new features. During the stream, the host engages with the audience by discussing various aspects of the phone, including its usage, performance, and user reviews. However, you are not a tech-savvy person and have only purchased a new smartphone four months ago, that there is no need to upgrade in such short time. You find that the live streaming content is not what you were looking for.

Figure 1 Main Experiment scenarios and scripts.

Study 1

Study 1 employed a single-factor between-subjects experimental design (relevance vs. irrelevance LS content), conducted online using a scenario in which an AI-generated virtual streamer recommended the latest smartphone with detailed specifications and functionalities. Smartphones were selected as the focal stimulus due to their dual role as utilitarian consumption objects and gateway technologies to digital media ecosystems, offering strong alignment with both U&G and MSD perspectives. Their functional nature enables a precise manipulation of content relevance and the elicitation of cognitive gratification, while simultaneously reflecting users' structural reliance on interconnected digital platforms.

Moreover, their ubiquity and frequent representation in contemporary LS contexts enhance ecological validity and support the generalisability of findings within Western digital environments

Prior to participation, informed consent was obtained from all participants, and ethical approval for the study was secured from a UK-based institution. Participants were randomly assigned to one of the two experimental conditions ($N_{irrelevance}$=74, $N_{relevance}$=88) via the Prolific platform. Each participant received £1 as compensation for completing the survey. The experimental scripts and the virtual streamer used in the scenario are provided in Figure 1. Across the two scenarios (relevant vs. irrelevant LS content), the script remained largely consistent, with only minor narrative differences introduced to participants. An attention check item was included, instructing participants to select "Yes" in response to a specific question; any responses failing this check were excluded during the data cleaning process.

We first ensured that all measurement scales, based on five-point Likert items, were adopted from established and reliable instruments in existing literature. Five items representing the relevance of LS content ($Mean_{relevance}$ =3.404, Cronbach's α = 0.884) were drawn from Shao (2024); five items indicating the media dependency ($M_{dependency}$ = 3.014, Cronbach's α = 0.858) were extracted from Han *et al.* (2019) and Li *et al.* (2019).

First, the manipulation check of our independent variable confirmed the effectiveness of the experimental conditions. Moreover, the Univariate Analysis of Variance was performed and participants in the relevant content condition (*n=88, M=3.84, SD= 0.67*) perceived significantly different from those assigned in the irrelevant content condition (*n=74, M=2.89, SD= 1.02*), *F (1, 159) = 51.07*, *p<0.001*. Second, it leads to investigate the direct impact between LS content relevance and media dependency, participants age and gender were considered as the control variables. We run the same analysis and the results were expected in line with our H1 proposition, we found out that participants who were exposed to relevant LS content ($M_{relevance}$*= 3.20, SD= 0.82*) show relatively stronger media dependency than those read irrelevant content ($M_{irrelevance}$*=2.79, SD= 0.95*), *F (1,159) = 9.80, p= 0.002*. We also observed no significant differences between the two groups on the control variables (e.g. age and gender), allowing us to rule out potential confounding effects. Therefore, H1 is accepted.

Study 2

Study 2 ($N_{irrelevance}$=81, $N_{relevance}$=84) was developed based on Study 1, we additionally measured the mediator (user gratification) in the similar pre-determined scenarios of the

smartphone example but to different participants on Prolific. Moreover, we adopted five items defining the user gratification ($Mean_{UG}$ = 3.916, Cronbach's α = 0.868) from Chiu and Huang (2015). First, manipulation check was approved, we found that participants in the relevant content condition (*n=84, M=3.60, SD= 0.83*) perceived significantly different from those assigned in the irrelevant content condition (*n=81, M=2.72, SD= 0.90*), *F (1, 161) = 39.98*, *p<0.001*. The second-step analysis was to apply the PROCESS Model 4 with 5,000 bootstrap (Han *et al.,* 2023) and test the mediating effect of user gratification. Furthermore, we set the content relevance as the independent variable, media dependency as the dependent variable. The results were merit as we anticipated in H2, user gratification positively (*b= 0.41, se= 0.08, p= .000, 95% CI= [0.25, 0.57]*) mediates the relationship between the relevance of LS content and viewers' media dependency (*b= 0.67, se= 0.05, p= .000, 95% CI = [0.57, 0.77]*). Of the control variables, neither participants' age nor gender had significant effects on media dependency. Therefore, H2 is accepted.

Study 3

Study 3 adopted a similar approach to Study 2, with the key distinction being the inclusion of an affective mediator - mood. Similarly, participants were recruited and randomly assigned via Prolific to two conditions ($N_{relevance}$= 149, $N_{irrelevance}$= 161). Each participant received £1 as incentive upon completing the survey, and we also kept the same attention check question. We first verified that measurement scales were reliable. Apart from the same independent and dependent variables ($Mean_{relevance}$= 3.01, Cronbach's α = 0.87; $Mean_{dependency}$= 2.95, Cronbach's α = 0.85), the mediator ($Mean_{UG}$= 3.47, Cronbach's α = 0.91), we adopted scales of Mood (M_{Mood}=2.85, Cronbach's α = 0.83) from Puccinelli *et al.* (2007) and Jackson and Luchner (2018). The manipulation check was conducted through the Univariate Analysis of Variance before examining the direct effect and mediation effects. Aligned with H1, our findings confirmed that the relevance of LS content significantly differed between the two experimental conditions. Moreover, participants perceived the LS content more positively in the control group ($M_{relevance}$ *=3.64, SD= 0.71*) than that of the experimental scenario ($M_{irrelevance}$ *=2.53, SD= 0.85, F(1,154) = 23.43, p<0.001.* Besides, based on the same control variables of Study 1, we observed no significant impact of age or gender on the direct effect.

Second, we conducted the same analysis to examine the main effect of LS content relevance on media dependency and mood. Similarly, we confirmed that participants who viewed more relevant LS content ($M_{relevance}$*= 2.80, SD=0 .80*) perceived stronger media dependency on LS

platform than those of irrelevant content ($M_{irrelevance}$*=2.23, SD= 0.83*), *F (1,161) = 29.77, p<0.001*). Third, we utilised the PROCESS Model 4 with 5,000 bootstrap to disclose the mediation effect of user gratification and mood separately. The results were satisfying in line with our proposition (H3), user gratification positively (*b= 0.50, se= 0.05, p= .000, 95% CI= [0.40, 0.60]*) mediates the relationship between the relevance of LS content and viewers' media dependency (*b= 0.31, se= 0.08, p= .000, 95% CI = [0.15, 0.48]*). We further detected the mediator (mood) via PROCESS Model 4, the results explained as follows: viewers' mood positively (*b= 0.41, se= 0.05, p= .000, 95% CI= [0.32, 0.50]*) mediates the relationship between the relevance of LS content and viewers' media dependency (*b= 0.42, se= 0.08, p= .000, 95% CI = [0.26, 0.59]*). Hence, H3 is accepted.

Discussion And Implications

Our research offers nuanced insights into the intersecting fields of marketing and management information systems (MIS). Using two-step scenario-based experiments, we investigated how socially driven LS usage and viewer perceptions are shaped by the relevance of broadcasting content, ultimately influencing media dependency. Specifically, we examined two mediating factors, user gratification and mood, implying a stronger mediated impact on the direct causal relationship. In Study 1, participants viewed AI-generated LS content showcasing the latest smartphone functionalities, findings indicate that perceived content relevance enhances media dependency. In Study 2 and 3, participants experienced a similar LS scenario, user gratification and mood served as mediators, with relevant content prompting stronger media dependency compared to the irrelevant condition. By replicating the same direct relationship with mediated conditions, our study highlights how streamers who focus on content relevance can stimulate greater viewer engagement and prosocial interaction (Shin *et al.,* 2024).

The academic contributions of this research are threefold. First, it extends LS scholarship beyond commerce-dominant Asian contexts to socially driven practices in a Western setting, thereby shifting the theoretical focus from transactional outcomes to content-driven engagement mechanisms. By foregrounding content relevance, the study moves beyond the prevailing emphasis on influencer characteristics and purchase behaviour to explain how the intrinsic value of content sustains viewer participation (Lyu *et al.,* 2025). Second, the study advances MSD theory by positioning LS as an interaction-intensive environment in which dependency is not merely structurally determined (Aldamen, 2023) but dynamically reinforced through repeated exposure to relevant content. In doing so, it reconceptualises dependency as

a processual outcome, extending MSD from a predominantly static, macro-level lens to a more dynamic framework suited to real-time digital media contexts. Third, the research develops a dual-path mechanism linking content relevance to media dependency by integrating cognitive and affective processes within a unified framework, demonstrating that user gratification operates as a cognition-driven pathway while mood captures a more immediate, affective route. Taken together, this multi-process perspective offers a more nuanced account of dependency formation and deepens our understanding of how viewers become embedded within contemporary digital media systems.

The practical implications of this research offer valuable guidance for various stakeholders involved in LS practices. First, our findings underscore the critical role of *content relevance* in driving viewer media dependency in LS sessions. Viewers are more likely to engage with and revisit LS platforms when the content aligns with their interests, topics of concern, or information needs. For influencers and marketers operating on LS platforms, it is essential to prioritise the delivery of compelling and contextually relevant content to foster sustained engagement and ultimately cultivate media dependency. Platform designers are encouraged to integrate algorithmic solutions and personalised content delivery mechanisms to better match viewers with relevant streaming content. Second, in addition to content relevance, *product characteristics* should be carefully considered when using LS as a marketing or communication tool. Our results reveal that viewer responses vary depending on whether the streaming content or product is more utilitarian or emotional-related. In a live, time-limited, and often impersonal virtual environments, viewers may be less receptive to detailed product specifications, especially if the content is perceived as irrelevant. This may lead to negative attitudes and disengagement from the LS session, viewers may scroll down to join other content or streaming platform. Therefore, we suggest that marketers and influencers adopt differentiated strategies: when promoting *hedonic-driven* content, emphasis should be placed on building emotional resonance (e.g., enhancing mood and personal connection with the audience). In contrast, when presenting utilitarian-driven content, streamers should aim to sustain viewer gratification and support rational decision-making through informative and cognitively engaging content.

Despite its contributions, this study is subject to several limitations that offer avenues for future research. While the scenario-based experimental design strengthens internal validity, it abstracts from the dynamic and interactive nature of LS environments. Future research could enhance ecological realism by leveraging longitudinal or behavioural data from platforms such as TikTok or YouTube to capture how content relevance and media dependency evolve over

time. In addition, the use of a utilitarian stimulus (smartphones) provides theoretical clarity for examining cognitive mechanisms but may constrain generalisability, as the relative influence of cognitive (user gratification) and affective (mood) pathways is likely to vary across product types, consumption goals, and levels of involvement. Future studies should therefore systematically compare utilitarian and hedonic contexts to refine these boundary conditions. Moreover, although this research conceptualises media dependency as a dynamic process, the cross-sectional design limits direct observation of its temporal development, warranting repeated-exposure designs to validate the proposed processual extension of MSD theory. Finally, future research should also explore the potential adverse effects of excessive media consumption, particularly given increasing reports of problematic social media use among younger users. It is important to balance exposure to appropriate and relevant content with a healthy level of media dependency, especially for this demographic.

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GREEN LUXURY FASHION: ARE CONSUMERS READY?

Papasolomou Ioanna[1], Kokkinopoulou Emmanouela[1], Riskos Kyriakos[2], Vronti Georgia[3], Dekoulou Evi[4]

[1]School of Business, University of Nicosia, Nicosia, Cyprus
[2]Department of Media & Communication, Erasmus School of History, Culture and Communication, Erasmus University Rotterdam, Rotterdam, Netherlands
[3]Department of Management, University of Limassol, Limassol, Cyprus
[4]Department of Journalism and Mass Communication, Aristotle University of Thessaloniki, Thessaloniki, Greece

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Introduction

Fashion has been intensely criticized for polluting the environment (Clube and Tennant, 2020). Many apparel, footwear, luxury, and textile companies have invested in sustainability programs to reduce environmental harm. Customers' role is important for the success of sustainability efforts since their purchase decisions and product use patterns shape what brands make, how much they make, and how long garments stay in use, so the biggest effect comes from combining consumer choices with pressure on brands and policymakers. Consumers are able to send market signals to brands (Horváth and Birgelen, 2015) with beneficial outcomes for both the environment and the society. Fast fashion has been under scrutiny for its detrimental outcomes but luxury fashion has also been criticized, even though the pollution pattern differs from fast fashion. Luxury brands typically sell lower volumes at higher prices, but they often rely on high-impact materials and use very demanding distribution standards.

In the luxury fashion sector, although sustainability has been more widely adopted due to the proliferation of SDGs, luxury brands still face significant challenges in their marketing strategies

(Franco et al, 2020). Previous studies have highlighted the role of social media (Fetais et al., 2023), the strength of online co-creation (Kokkinopoulou et al., 2025), brand-building activities (Tarnanidis et al., 2025) and artificial intelligence in marketing (Khamoushi Sahne and Kalantari Daronkola, 2025). The aim of this study is to shed light on this topic, by conducting theoretical and empirical research in two different European countries, Cyprus and Greece, focusing on Generations Ys' and Zs' perceptions and attitudes towards luxury fashion brands and their claims towards sustainable marketing.

Purpose, Aim of the Study

Satisfying diverse consumers' needs in fashion, is challenging and the majority of fashion firms fail to achieve this goal (Arantes and Barbosa, 2025). Volcova and Karpushkin's (2025) revealed that few countries dominate the luxury fashion sector, with France, the USA, Switzerland, Italy, and Russia generating 80% of the overall revenue. Sustainability in the luxury fashion sector is scarce, although there have been some efforts regarding the Chinese market (Huang and Jiang, 2025), Italy or the UK (Moisello and Pellicelli, 2025).

The purpose of this paper is to shed light on the findings of an exploratory research study in the field of luxury fashion and its relationship to sustainability. The key purpose of the study is twofold: (a) to explore the existent literature on luxury fashion brands and sustainability through the systematic literature review methodology and (b) to empirically explore how sustainability-oriented marketing practices have the power to change consumers' mindsets and cultivate sustainability-endorsed behaviours aimed at increasing consumers' intentions to buy sustainable luxury fashion brands.

Grounded on this evidence, this study, focuses on Generation Y and Z in Cyprus and Greece, two countries in the Southeastern Mediterranean area, with similar values on the one hand, but quite different fashion consumption habits on the other hand. Gen Z's pressure for sustainability is redefining luxury, with brands targeting younger generations on social media. Luxury fashion in Greece and Cyprus is experiencing robust growth, primarily fueled by tourism and strong local demand. In 2022, the personal luxury goods segment raised approximately €510M in sales in Greece, generating an increase of more than 35 percent compared to 2021 (KPMG report, 2024a). Greece's personal luxury goods market reached approximately €509.8M in 2022, achieving over a 35% growth from 2021 (KPMG report, 2024b). Luxury fashion revenues are expected to reach

US$57.20m in 2026 in Greece (Statista, 2026a), and US$19.30m in Cyprus (Statista, 2026b). Additionally, in Cyprus, the revenue in the luxury goods market is expected to reach US$39.44m in 2026 (Statista, 2026c). Nevertheless, the need to redirect consumers' preferences towards sustainable luxury brand choices becomes more evident now than ever before is evident, as previous research showed that Cypriots have a large waste of textiles and a minimum percentage of recycling habits (Papamichael et al., 2024).

Thus, the main purpose of the present study is to investigate the effects of sustainable marketing practices implemented by luxury fashion businesses and how they impact consumers' attitudes, perceptions and behaviour. The research questions that guided this study were:

RQ1: To conduct a systematic literature review on the sustainability efforts within the luxury fashion sector and their impact on consumers' perceptions, attitudes and purchase intentions.

RQ2: To empirically test the SLR findings among Gen Y and Gen Z consumers living in these two European countries.

RQ3: To develop a framework to guide luxury fashion firms to incorporate successful sustainability marketing activities into their marketing strategies.

Figure 1 illustrates the conceptual framework that guided this study:

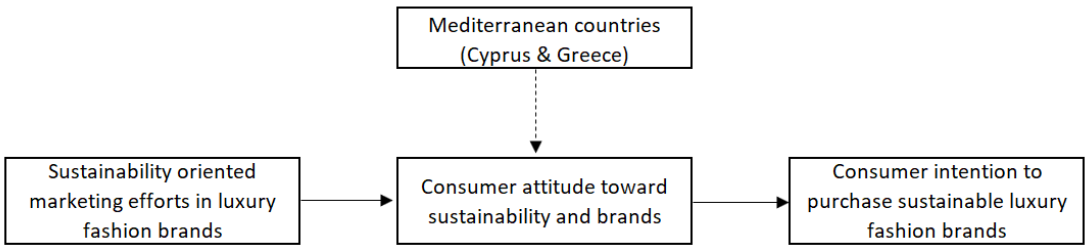


Figure 1: Conceptual framework

Methodology

Atewologun et al. (2017), suggested an SLR that focused on ABS3 and ABS4 or ABS4* journal articles to ensure validity and high-quality studies (Brooks, Schopohl, and Walker, 2023). After setting the review protocols (Battisti et al., 2024), and following the PRISMA methodology, and articles that were not peer-reviewed were excluded. Also, papers that were not in English, as well

as conference proceedings, were not taken into consideration, (Vrontis et al., 2021). A descriptive analysis was applied, followed by a thematic analysis of the selected articles. This process aimed at detecting research gaps, that can guide future researchers on sustainable luxury fashion marketing.

The empirical part will include a statistical analysis providing valuable findings about the relationship between marketing strategies, consumer attitude towards sustainable luxury brands and finally their intention to purchase luxury fashion items. Online surveys will take place in both countries, targeting participants from Generations Y and Z.

Research Limitations

This study may have limitations due to the cross-sectional nature of the research and the methodological approach. Additionally, it is focusing on two small Mediterranean countries, limiting the generalizability of the findings.

Implications for Theory and Practice

The theoretical implications are based on the valuable additions to the marketing and consumer's behavior theory, by revealing important factors that affect consumers' attitude, toward sustainable luxury fashion purchases.

On a practical level, this research study is planning to offer guidelines for luxury fashion brands in terms of marketing strategies, focusing on shifting consumers' attitudes and behaviour towards more sustainable fashion practices.

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SHOW, DON'T TELL: HOW CUSTOMERS PERCEIVE SUSTAINABILITY COMMUNICATION BY HOTELS IN CYPRUS

Pakhalov, Alexander; Antonaras, Alexandros; Efthymiou, Leonidas; Memtsa, Chrysi

School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Sustainability communication, Corporate social responsibility (CSR), Customer perception, Hotel industry, Cyprus, Semi-structured interviews

Introduction

Stakeholder involvement is a core component of corporate sustainability initiatives in tourism and hospitality (Vrontis et al., 2022). Such involvement requires carefully designed communication tailored to needs and preferences of different stakeholders including customers (Tölkes, 2020; Isaac et al., 2025). However, a recent systematic review by Pakhalov et al. (2025a) indicates that tourists' perceptions of sustainability communication formats and channels remain insufficiently explored. This gap limits the effectiveness of sustainability initiatives (Lewin et al., 2026) in the hospitality industry.

Aim and Objectives

The present study aims to examine customer perceptions of sustainability communication formats in the hospitality sector, drawing on interviews with guests of hotels in Cyprus. The objectives of the study are to examine hotel guests' exposure to sustainability communication in Cyprus hotels and to analyse their perceptions of different sustainability communication formats using real artefacts from Cypriot hotels.

Literature Review and Theoretical Framework

Customer perception of sustainability communications can be analysed through a range of theoretical perspectives. Attribution theory suggests that customers place greater trust in CSR information conveyed through media channels not controlled by the firm (Pérez and García De Los Salmones, 2023), whereas construal level theory highlights the advantages of concrete CSR messages over more abstract ones (Grazzini et al., 2018). Recent studies based on cognitive linguistics (Bernard et al., 2024) and norm activation model (Surira et al., 2025) demonstrate that consumer perceptions of hotel sustainability messages vary significantly depending on their style and tone of voice.

Methodology and Methods

This study employed a qualitative research design based on semi-structured, confidential interviews with 18 tourists who stayed in upscale and luxury star-rated hotels in Cyprus in 2024-2025. Data saturation was reached after 15 interviews, consistent with established qualitative research standards (Hennink and Kaiser, 2022). Although a non-probability purposive sampling strategy was used, the sample composition was controlled for gender, age, and country of residence to reflect the structure of tourist arrivals to Cyprus (CYSTAT, 2025). The final sample comprised 10 female (55.5%) and 8 male (44.5%) respondents, closely reflecting the gender distribution of tourist arrivals (54.6% and 45.4%, respectively). In terms of age, 27.8% of interview participants were aged 20-31 years, 61.1% were aged 32-64 years, and 11.1% were over 64 years old (compared with 28.6%, 58.4%, and 13.0% of tourist arrivals, respectively). Participants represented 12 countries, including major outbound markets such as the United Kingdom, Greece, Germany, and the Scandinavian countries.

The topics discussed during the interviews were experience of staying at a hotel in Cyprus, communications from the hotel before and during the stay, sustainability practices observed at the hotel and sources of information about them. Respondents viewed and discussed with the interviewer ten artefacts representing different formats of sustainability communications of real hotels in Cyprus (hotel names and logos were hidden to exclude possible brand influence, stimuli were presented in a randomized order). At the end of the interview, respondents were asked, without prompting, to name the artefact they liked and remembered most. Anonymised interview transcripts were analysed thematically using QDA Miner and NotebookLM.

Findings and Contribution

All the interviewees noted that they rarely encountered communication about hotel sustainability before and during their stay. Among the communication formats noted by the respondents were in-room informational signs about water saving measures in rooms and waste sorting instructions in common areas. Interview participants explicitly expressed interest in learning more about hotel sustainability through interactive digital and onsite formats.

Although many managers of Cypriot hotels consider the sustainability section of a website to be an important channel for CSR communication (Pakhalov et al., 2025b), nearly all interview participants (11 out of 18) expressed strong skepticism toward this format, citing limited specificity, vague language, and concerns about potential greenwashing. At the same time, in

line with construal level theory (Grazzini et al., 2018), participants reacted favourably to fragments of sustainability reports presenting environmental performance indicators (9 positive reactions, 6 neutral, 3 negative) and social media posts clearly showing specific sustainability actions (15 positive reactions, 1 neutral, 2 negative). Notably, the hotel's social media post was received more positively than a similar post on behalf of an independent sustainability initiative, calling into question the attribution theory insights (Pérez and García De Los Salmones, 2023) in the Cyprus context.

Interviews also identified differing attitudes among participants toward two common formats of CSR materials used by hotels in Cyprus: a digital leaflet outlining the hotel's CSR initiatives (one-way communication) and a digital leaflet presenting recommended actions for responsible guests (two-way communication). The 'two-way' leaflet elicited more positive reactions from the interview participants (13 positive reactions, 5 negative) compared to the 'one-way' leaflet (4 positive reactions, 6 neutral, 8 negative). When comparing these two artefacts, several respondents made direct reference to their role (or lack thereof) in the sustainability initiatives.

Finally, the current study provides new insights into the perception of 'unusual' (or 'creative') ways in which hotels communicate sustainability. Two 'unusual' artefacts (a calendar with stray cats cared for by a hotel and an upcycled art project with doors dedicated to the UN SDGs) were among the top three artefacts in terms of both positive evaluation at the time of display and short-term memorability. Interview participants generally rated these communications positively, assessing them as both emotional triggers and curiosity drivers.

Limitations

The qualitative nature and the geographical scope of the current study may limit its generalizability and require verification in further quantitative and cross-country research. In addition, the potential social desirability bias could be addressed in further research by supplementing self-reported information with eye-tracking or experimental data.

Implications

The findings corroborate earlier evidence regarding the undesirability of greenhushing from the guest perspective (Ettinger et al., 2021). Furthermore, they provide an initial framework for effective sustainability communication in the hotel context. Specifically, sustainability messages should be both creative (unusual) and informative (specific). It is also important to clearly communicate opportunities for guests to engage in sustainability initiatives.

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EXPLORING HOW JOB DEMANDS AND RESOURCES INFLUENCE TEACHERS' PERFORMANCE: A BURNOUT-MEDIATED AND EMOTIONAL-INTELLIGENCE-MODERATED FRAMEWORK

Paulienė Rasa, Tamaševičius Virginijus, Trusilaitė Gabrielė, Kasnauskienė Gindrutė, Raudonė Odeta

Faculty of Economics and Business Administration, Vilnius University, VU, Vilnius, Lithuania

Keywords: Job Demands; Job Resources; Job Performance; Teachers' Burnout; Emotional Intelligence; Educational Institutions, Lithuania.

Abstract

Teachers' perceptions of job demands and resources (JD–R) – core non-monetary work conditions – are central to understanding job performance amid rapid educational change. Broader transformations in the world of work, driven by globalization, liberalization, and technological advancement, intensify these dynamics (Ha et al., 2025). Although JD–R, burnout, emotional intelligence (EI), and job performance have each been widely examined, existing research often addresses these constructs in isolation rather than within an integrated conditional process framework, particularly in educational settings.

The JD–R model is strongly linked to burnout (Jomuad et al., 2021). Research has also explored the interaction between burnout and EI (Kant & Shanker, 2021) and the directionality of burnout–performance relationships (Leiter & Maslach, 2005), yet debates remain regarding when and for whom burnout most strongly affects performance, and which resources are most protective. Moreover, limited attention has been paid to how EI functions simultaneously as a moderator within JD–R-based mediation models, especially outside commonly studied Western organizational contexts.

This study develops and tests a conditional process model in which burnout mediates the effects of JD–R on teachers' job performance, while EI moderates these relationships. By focusing on teachers in the Lithuanian educational context, the study addresses an underrepresented setting characterized by high reform pressure and increasing job demands. The objectives include estimating direct effects (demands/resources → burnout/performance), assessing the impact of

burnout on performance, and examining mediation and moderated mediation through EI. Based on the reviewed literature, the following hypotheses are proposed:

H1. Job demands increase the level of teacher burnout.

H2. Job resources reduce the level of teacher burnout.

H3. Teacher burnout has a negative impact on job performance.

H4. There is an inverse relationship between job demands and job performance.

H5. There is a direct relationship between job resources and job performance.

H6. Emotional intelligence has a positive impact on teacher performance.

H7. Emotional intelligence moderates the relationship between teacher burnout and job performance.

H7a. Emotional intelligence moderates the indirect relationship between job demands and job performance mediated by teacher burnout.

H7b. Emotional intelligence moderates the indirect relationship between job resources and job performance mediated by teacher burnout.

Grounded in the JD–R model (Bakker et al., 2003), the framework assumes that job demands heighten burnout while resources mitigate strain (Jomuad et al., 2021). Integrating burnout and EI extends prior research on EI–burnout dynamics (Kant & Shanker, 2021) and clarifies the burnout–performance debate (de Mendonça et al., 2023), while explicitly positioning EI as a boundary condition within a JD–R-based mediation framework. This conceptual integration differentiates the proposed model from earlier studies that examined EI mainly as a direct predictor or simple moderator.

A quantitative cross sectional survey used validated scales (Maslach & Jackson, 1981; Jackson & Rothmann, 2005; Petrides, 2009; Pradhan & Jena, 2016) and included n = 405 anonymously completed questionnaires obtained through non probability convenience sampling. The selection of specific job demands and resources was guided by prior JD–R research in educational settings and their relevance to contemporary teaching conditions. Descriptive analysis was conducted in IBM SPSS, while direct, mediated, and moderated effects were tested using PLS SEM in SmartPLS 4.

No significant associations were found between burnout and eight demographic variables, although field of education mattered, with lower burnout among primary education teachers. JD–R assumptions were supported: job demands increased burnout, while job resources reduced it. Growth opportunities, colleague relationships, control, and compensation predicted lower burnout; organizational support did not. Burnout negatively affected performance, while

job demands showed a positive direct relationship with performance. Job resources improved performance, and burnout mediated both JD–R–performance relationships. EI moderated the burnout–performance link and supported moderated indirect effects. The study advances JD–R theory by integrating EI as a boundary condition and by demonstrating its relevance in a post-transition European educational context**.**

Limitations include the restricted range of JD–R variables, self-report data, convenience sampling, and cross-sectional design. Practically, schools should implement regular assessments of teacher burnout and work conditions, as burnout emerged as the central mechanism linking job demands to performance. Strengthening key job resources - such as autonomy-supportive leadership, meaningful professional development, fair compensation, and collegial collaboration - can both reduce burnout and directly enhance performance, while workload decisions should be calibrated to burnout levels by limiting hindrance demands and carefully managing challenge demands. In addition, counseling services and emotional intelligence–focused coaching can help buffer the negative effects of burnout, supporting more sustainable teacher wellbeing and performance.

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RECURSIVE SENSEGIVING IN IDENTITY-INTENSIVE SMES: A LEADERSHIP AND DESIGN FRAMEWORK

[1]Alessandra VITALE, [2] Sławomir SMYCZEK and [1]Marco VALERI

[1] Niccolò Cusano University, Rome, Italy
[2] University of Economics in Katowice, Poland

Keywords: Sensemaking; Sensegiving; Organisational design; Leadership architecture; Identity governance; Legitimacy; Made in Italy SMEs; Market publics.

Introduction

In identity-intensive SMEs, including many Made in Italy firms and other symbolically dense sectors**,** competitive advantage relies on symbolic resources (craftsmanship narratives, authenticity cues, origin claims, aesthetic codes) that circulate beyond organisational boundaries and are interpreted, reworked, and evaluated by external audiences. Sensemaking explains how organisations stabilise action under ambiguity, while sensegiving captures leaders' efforts to shape meaning during strategic change (Weick, 1995; Gioia and Chittipeddi, 1991; Maitlis and Christianson, 2014). In parallel, Consumer Culture Theory (CCT) and recent work on brand publics, digital publics, and the platformisation of consumer culture show that market actors do not simply receive organisational meanings, but appropriate, remix, circulate, and contest marketplace symbols across social, cultural, and digital arenas (Arnould and Thompson, 2005; McCracken, 1986; Arvidsson and Caliandro, 2016; Caliandro et al., 2024). This is particularly relevant for identity-intensive SMEs, whose claims to authenticity, origin, and craftsmanship are increasingly exposed to online visibility, stakeholder scrutiny, and platform-mediated reinterpretation. Yet these conversations often remain insufficiently connected. Sensemaking and sensegiving research has mainly examined how organisational actors construct and influence meaning, whereas CCT has mainly examined how consumers and market publics generate cultural meanings around products, brands, and consumption practices. What remains underdeveloped is a leadership and organisational design explanation of how external meanings feed back into organisational identity claims, legitimacy judgments, and strategic adaptation (Suchman, 1995; Hatch and Schultz, 2002; Ravasi and Schultz, 2006; Czakon et al., 2024). Addressing this gap, the paper conceptualises recursive sensegiving as a process through which organisational identity narratives and market meaning construction co-evolve through repeated feedback between leadership, design structures, market publics, and legitimacy assessments.

Purpose

This paper develops a leadership- and organisational design-oriented framework explaining how organisational sensegiving and market meaning construction co-evolve through a recursive feedback loop in identity-intensive SMEs, shaping identity, legitimacy, and strategic adaptation. More specifically, it aims to integrate sensemaking/sensegiving, Consumer Culture Theory, recent debates on brand and digital publics, and identity-legitimacy scholarship in order to explain how external meaning variations are reabsorbed into organisational identity work. The paper also identifies leadership and design levers at the organisation-market interface and derives testable propositions for future empirical research.

Theoretical Framework

The framework connects three bodies of literature. First, sensemaking and sensegiving are conceptualised as organisational meaning processes through which actors interpret ambiguity, stabilise collective action, and intentionally influence how others understand strategic issues (Weick, 1995; Gioia and Chittipeddi, 1991; Maitlis and Christianson, 2014). Second, CCT and cultural meaning transfer explain how market meanings are produced, circulated, and transformed beyond the firm. In this perspective, market publics are not passive recipients of organisational communication, but cultural agents who appropriate, remix, contest, and amplify symbolic resources, increasingly through digital and platform-mediated arenas (Arnould and Thompson, 2005; McCracken, 1986; Arvidsson and Caliandro, 2016; Caliandro et al., 2024). Third, organisational identity and legitimacy scholarship clarifies how firms seek to maintain coherence, distinctiveness, and credibility when external interpretations challenge their identity claims or expose tensions between authenticity and adaptation (Suchman, 1995; Hatch and Schultz, 2002; Ravasi and Schultz, 2006; Czakon et al., 2024).

Building on these streams, the paper defines *leadership architecture* as the configuration of leadership roles, boundary-spanning responsibilities, interpretive routines, and decision rights through which identity-related meanings are articulated, authorised, monitored, and revised. *Identity governance* refers to the organisational capacity to define, protect, adapt, and account for identity claims across internal and external audiences while preserving symbolic coherence and legitimacy.

Together, these perspectives support a recursive meaning loop: organisational sensegiving shapes symbolic resources for market appropriation, while market meaning construction becomes an enacted interpretive environment feeding back into identity governance. This loop

is particularly salient in identity-intensive SMEs, where value depends on symbolic resources such as origin, craftsmanship, authenticity, design, and cultural distinctiveness. In such contexts, external interpretations do not merely affect reputation; they may reshape what the organisation considers legitimate, authentic, and strategically viable. The framework therefore moves beyond a linear communication model, in which firms craft meanings and markets interpret them, and conceptualises recursive sensegiving as a co-evolutionary process linking leadership, organisational design, market publics, and legitimacy feedback.

Methodology

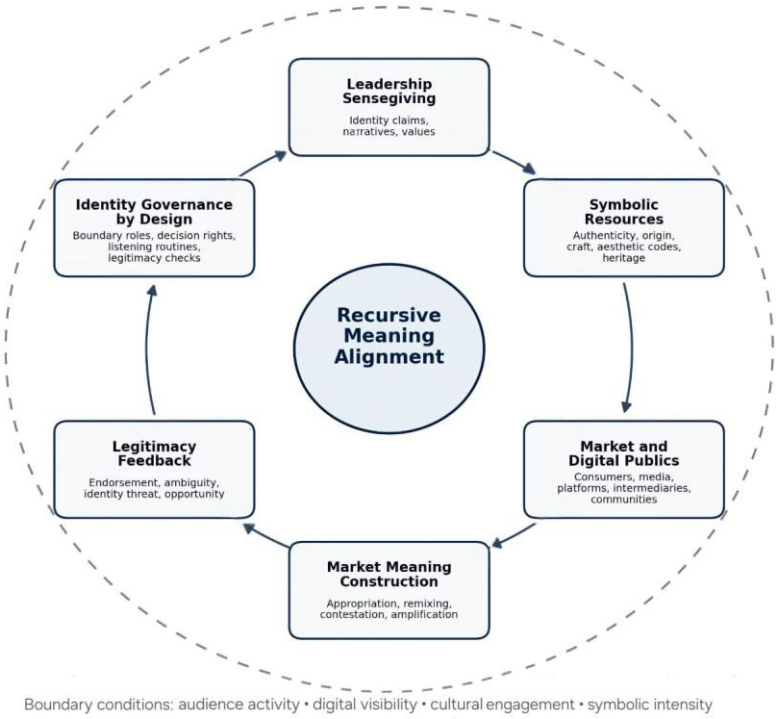
The study adopts a conceptual, integrative research design aimed at theory development rather than empirical hypothesis testing. It synthesises core constructs across sensemaking/sensegiving, Consumer Culture Theory and market publics, and organisational identity-legitimacy scholarship. The conceptual development proceeded in three steps. First, the main constructs were identified and compared across the selected theoretical streams. Second, their points of intersection were organised into a recursive process model specifying the mechanisms through which leadership sensegiving, market meaning construction, legitimacy feedback, and identity governance interact. Third, design-oriented propositions were formulated to clarify the organisational conditions under which external meaning variation is more likely to become adaptive learning rather than legitimacy threat. Brief illustrations from publicly available material on Made in Italy SMEs and other identity-intensive sectors, such as fashion, wine, craft, design, cultural tourism, and heritage-based brands, are used only to support conceptual clarification, not as empirical evidence or as a basis for causal claims.

Findings

The paper advances a leadership-and-design framework centred on Recursive Meaning Alignment, represented in Figure 1. The model conceptualises recursive sensegiving as a circular process through which leadership sensegiving shapes symbolic resources, market and digital publics reinterpret these resources, and market meaning construction generates legitimacy feedback that returns to the organisation through identity governance by design. In this process, boundary roles, decision rights, listening routines, and legitimacy checks mediate whether external meaning variation is translated into organisational learning, identity renewal, legitimacy repair, or symbolic drift. The external boundary conditions indicate that the strength

and direction of this recursive process depend on audience activity, digital visibility, cultural engagement, and symbolic intensity.

Figure 1. Recursive Meaning Alignment in identity-intensive SMEs
Source: Authors' own elaboration.



Building on this model, the framework is articulated through four propositions: (P1) in identity-intensive SMEs, stronger leadership sensegiving increases the coherence and recognisability of identity claims; however, when these claims are highly exposed to market and digital publics, it also increases vulnerability to reinterpretation and authenticity-adaptation tensions. (P2) Organisational designs that formalise boundary-spanning roles and clarify decision rights over identity narratives are more likely to transform external meaning variation into organisational learning rather than legitimacy threat. (P3) Institutionalised feedback architectures, such as structured listening routines and periodic legitimacy checks, increase the likelihood that external meaning construction triggers strategic adaptation while preserving identity continuity. (P4) The positive relationship between recursive sensegiving and adaptive identity renewal is stronger when market publics are active, digitally visible, and culturally engaged, and weaker when external audiences are fragmented, passive, or only weakly connected to the firm's symbolic resources.

Originality

The paper repositions market meaning construction as a leadership and organisational design issue: meaning is not merely communicated but governed through leadership architectures, boundary interfaces, and decision-right allocations, enabling learning from market meanings without rigid authenticity policing or opportunistic drift. Its originality lies in shifting the analysis from one-way symbolic communication to recursive identity governance. In this view, external market meanings are not treated as reputational outcomes only, but as interpretive inputs that can reshape leadership sensegiving, organisational design, and legitimacy management. The framework also highlights the risk of performative authenticity, especially in digitally mediated publics, where identity claims may be rapidly amplified, challenged, or imitated. By specifying boundary roles, decision rights, and feedback architectures, the paper offers a design-based explanation of how identity-intensive SMEs can remain responsive to market reinterpretation without diluting the symbolic coherence on which their competitive advantage depends.

Limitations

As a conceptual contribution, the framework is not empirically tested and relies on illustrative examples; generalisability and causal claims remain bounded until future validation. Moreover, the framework is developed primarily for identity-intensive SMEs, where symbolic resources such as origin, craftsmanship, authenticity, and aesthetic codes are central to value creation. Its applicability to less identity-dependent firms, larger organisations, or highly standardised industries therefore requires further examination. Future research should test the model through longitudinal case studies, comparative research across symbolic sectors, and digital trace analyses of how market and digital publics reinterpret organisational identity claims over time.

Implications

The paper extends sensemaking by treating market publics as an interpretive constituency within organisational meaning cycles and extends CCT by specifying leadership and design conditions shaping meaning dynamics. Theoretically, it contributes to identity-legitimacy scholarship by showing that legitimacy feedback is not only an external evaluation of organisational claims, but also a trigger for internal identity work, leadership sensegiving, and organisational redesign. Practically, it reframes authenticity management as identity

governance by design: SMEs should appoint accountable boundary-spanning roles, clarify decision rights over identity claims, and institutionalise feedback routines that convert external discourse into organisational learning while preserving authenticity-based coherence. These implications are especially relevant in digitally mediated publics, where identity claims may be rapidly amplified, challenged, or transformed, increasing both opportunities for adaptive learning and risks of performative authenticity or symbolic drift.

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IMPACT OF PERFORMANCE MANAGEMENT SYSTEMS ON LEADERSHIP READINESS AMONG ADMINISTRATIVE STAFF IN UNIVERSITIES: THE CASE OF LEBANON

Abi Khers[1], Elyse

[1]Office of the vice rector, Antonine University, Lebanon

Keywords: Leadership development, performance management systems, higher education, leadership readiness, organizational culture, human resource management, universities.

Introduction

Universities operate in increasingly complex environments characterized by financial pressures, digital transformation, and evolving accreditation requirements. Given the distinctive characteristics of universities such as governance, academic autonomy, and complex departments relationships, the effectiveness of performance management systems largely depends on how employees perceive the accuracy and fairness of the system's implementation (Luthra & Jain, 2012).

In this context, performance management systems (PMS) and leadership development have become essential strategic tools for aligning individual performance with institutional objectives and ensuring organizational sustainability (Aguinis, 2019; Armstrong, 2020). Their primary objective is to ensure that individual goals align with organizational objectives, thereby enhancing overall effectiveness and productivity (Helmold & Samara, 2019).

Purpose, Aim and Objectives

The study explores employees' experiences with performance management systems and their perceived role in supporting leadership readiness.

Literature Review and Theoretical Framework

Strategies for effective implementation, such as organizational readiness assessments, delivering comprehensive training programs, and strong leadership involvement, play a critical role in

ensuring the successful adoption of advanced PMS. These approaches help reduce resistance to change, build employee competencies, and create an enabling environment that supports innovation and performance enhancement (Bristol-Alagbariya et al., 2022).

Leadership readiness refers to the preparedness of individuals to assume leadership responsibilities through the development of essential competencies such as strategic thinking, decision making, communication, accountability and change management effectively (Day, 2000; Yukl, 2020).

To facilitate the adoption of PMS, leaders must champion the initiative, demonstrating commitment to its success and aligning their actions with its objectives. A key responsibility of leadership is to communicate a vision, explaining how PMS contribute to institutional goals and reinforcing organizational values, leaders can inspire employee confidence and enthusiasm. This communication should be consistent and transparent, helping employees build trust, reduce uncertainty, and enhance their engagement by addressing both the benefits and potential challenges associated with the system (Bristol-Alagbariya et al., 2022). Research demonstrates that high-quality feedback and supportive performance cultures enhance employee learning, motivation, and growth (Decramer et al., 2013).

Methodology and Methods

Adopting qualitative research approach, this study is based on semi-structured interviews with administrative staff in universities in Lebanon. Participants were selected through purposive sampling based on their experience with performance management systems. The interview transcripts were thematically analyzed through coding, categorization, and the identification of recurring themes, which were then reviewed against the original data to ensure consistency.

Findings and Contribution

The findings indicate that performance management systems can contribute to leadership development through practices such as coaching conversations, mentoring, and succession planning. Conversely, systems perceived as bureaucratic or overly standardized limit their development impact and weaken staff engagement. This study examines how performance management systems can function not only as evaluative mechanisms but also as strategic instruments for developing internal leadership capacity among administrative staff in Lebanese universities.

Originality and Value

The originality of this study lies in examining performance management systems as instruments for leadership development among administrative staff in Lebanese universities, a context that has received limited attention in the literature.

Research Limitations

The study is limited by its qualitative design, purposive sampling approach, and focus on administrative staff in selected Lebanese universities, which may affect the transferability of the findings to other contexts.

Theoretical and Practical Applications and Implications

It provides practical implications for university governance and human resource management by highlighting how the strategic alignment of performance management systems may enhance staff engagement, leadership readiness, and long-term institutional effectiveness.

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TIMEISM, AI AND INCLUSION IN HIGHER EDUCATION: EXPLORING EDUCATOR EXPERIENCES THROUGH A CRITICAL LENS

Georgiadou, Andri[1]; Damianidou, Eleni[2]

[1]University of Nottingham, Nottingham, United Kingdom

[2]European University of Cyprus, Nicosia, Cyprus

Keywords: Artificial Intelligence, Higher Education, Timeism, Inclusion, Educator Perspectives

Introduction

AI tools are being adopted rapidly across higher education: automated feedback, adaptive learning platforms, algorithmic grading and AI-driven tutoring. Yet their inclusion implications remain poorly understood, and educators are left without frameworks to navigate them. These tools carry assumptions about pace, productivity and acceptable performance that are not neutral and sit on top of pre-existing educational inequalities.

Purpose, Aim and Objectives

This exploratory study examines how academics in higher education currently perceive, experience and navigate the inclusion implications of AI in their teaching and assessment. The aim is to develop an empirically grounded framework for inclusive AI implementation, built from educator experience rather than top-down policy. Three exploratory questions guide the study: how do academics perceive and decide on AI adoption; what inclusion challenges do they encounter in practice; and what institutional support, if any, exists when those challenges arise?

Literature Review and Theoretical Framework

Timeism - a concept we introduced through qualitative research (Georgiadou and Damianidou, 2025) - denotes the privileging of normative temporal expectations and the marginalisation of those constructed as too slow, too different, or out of sync with dominant rhythms. In this study it is operationalised as the embedded temporal assumptions through which AI tools judge pace and performance: adaptive platforms route students by early performance data, automated grading penalises stylistic and cultural difference, and algorithmic pacing assumes uniform

readiness. Our earlier work showed that educational technology adopted without differentiation pushed disabled learners further to the margins, because the tools were built around a narrow norm (Damianidou and Georgiadou, 2024). The workplace inclusion taxonomy of Lazazzara et al. (2025) distinguishes AI that assists, augments or automates, but was built for organisational settings. We have begun translating it into education conceptually (Georgiadou et al., 2026); education, however, differs in ways that matter: learning is developmental rather than productive, the teacher-student relationship is trust-based rather than managerial, and students carry vulnerabilities those frameworks never accounted for.

Methodology and Methods

The study adopts a qualitative, exploratory design using in-depth semi-structured interviews. Participants will be recruited through purposive and snowball sampling, targeting approximately 20 to 25 academics across disciplines and institutional contexts, with recruitment continuing until data saturation is reached. Interviews will be analysed using Braun and Clarke's (2021) reflexive thematic analysis, moving through familiarisation, inductive coding and theme development, with timeism as the organising analytic lens. The researchers acknowledge their positionality as scholars of inclusion and timeism, which shapes interpretation and is treated reflexively throughout coding.

Expected Findings and Contribution

We expect findings to show how timeist logics become embedded in AI tools and go unrecognised by the institutions deploying them, that educators lack consistent tools for identifying inclusion risk, and that institutional support is procedural rather than pedagogical. It produces practical guidance for educators and institutions.

Originality and Value

The study brings together two previously separate streams of work, on timeism and on educational inclusion, and moves beyond conceptual translation to ground inclusive AI in higher education empirically in educator experience. It reframes AI adoption in education as an inclusion question rather than only an efficiency one.

Research Limitations

The study is situated in specific institutional contexts with particular characteristics, so the findings will reflect those settings rather than higher education generally. As a qualitative

study, it seeks depth and transferability rather than statistical generalisation, and its findings cannot be generalised to wider populations. Reliance on self-reported interview data may also introduce recall and social-desirability effects.

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FROM SOCIAL IDENTITY TO INSTITUTIONAL PRACTICE: DECONSTRUCTING OTHERNESS IN ORGANISATIONS

Raz Rotem, Michal[1]; Abboud Armaly, Oriana[2]

[1]Department of Human Services, Max Stern Yezreel Valley College, Afula, Israel

[2]Department of MA Studies in Organizational Development and Consulting, and Center for Diversity and Intergroup Conflict Studies, Max Stern Yezreel Valley College, Afula, Israel

Keywords: Otherness, Intergroup relations, Employee-client encounters, Organisational diversity

Introduction

Although studies address intergroup contact in complex settings, there is still a knowledge gap regarding how discourse manifests in organisational experiences of 'otherness'. Our study addresses this gap by revealing how a complex context characterised by a democratic regime coupled with social divisions shapes the definition and experience of 'otherness' in organisations.

Purpose, Aim and Objectives

The study aims to answer several research questions: How do employees and clients in diverse organisations perceive and define 'otherness'? What are their experiences during encounters with the 'other' and how does the broader complex context of a diverse, polarised society that advocates democratic values manifest in these encounters.

Literature Review and Theoretical Framework

'Otherness' refers to construction of belonging and non-belonging that produces marginalisation and structural inequality through discrimination, denial of rights, stigmatisation, systemic oppression and ethnocentric ideologies (Akbulut & Razum, 2022). In organisations, 'otherness' might manifest in employee-client encounters as communication barriers, distrust, stigma, tension, alienation and social isolation (Muse et al., 2021). Such encounters become even more complex in diverse, polarised societies, where intergroup differences can intensify rivalry and tension (Desivilya Syna, 2020).

The essentialist approach, grounded in Social Identity Theory, has long provided a foundational framework for understanding how group membership shapes in-group/out-group distinctions, giving rise to prejudice and discrimination at interpersonal and individual levels alike (Tajfel & Turner, 1986).

The critical approach extended this understanding by foregrounding the structural level, arguing that power relations, marginalising discourses and systemic inequalities constitute an equally significant dimension of intergroup encounters in organisations (Desivilya Syna, 2020). Taken together, these complementary frameworks offer a more comprehensive lens through which to examine 'otherness' in service encounters, capturing the structural, interpersonal and individual dimensions of the phenomenon.

Methodology and Methods

Employing a qualitative approach, data were collected through 35 in-depth, semi-structured interviews with Israeli employees who served clients from diverse social backgrounds (n=20) and immigrant clients (n=15), and analysed using thematic analysis.

Main Findings and Contribution

The findings show that 'otherness' is expressed across several levels. At a *structural level*, 'otherness' is evident in lack of accessibility due to communication barriers. This negatively impacts perception of the quality of service provided to clients.

At an *interpersonal level*, clients and employees point to perceptual gaps rooted in their different backgrounds. These gaps are seen as a source of tension and may lead to prejudices that negatively influence their mutual perceptions. On an *individual level*, employees and clients described feelings of alienation, reduced trust, embarrassment and lack of empathy, stemming from perceptual gaps that emerged during their encounters. In their opinion, these experiences may lead to client dissatisfaction with the services provided.

Our findings demonstrate how 'otherness' operates through the intersection of levels, preventing diverse populations from accessing equitable services, while burdening employees with managing encounters with the 'other'. This complexity can fuel tension, prejudice and perceptual gaps, particularly in polarised societies. However, it can also offer employees exposure to new perspectives, which can encourage productive diversity and inclusion management.

Originality and Value

This study identifies how a complex context of democratic values and social divisions manifests in experiences of 'otherness' in employee-client encounters. Thus, we uniquely integrate several lenses of both essentialist and critical approaches.

Research Limitations

This study explored 'otherness' through encounters with immigrant clients. Further research should examine other minority populations to capture complexity in polarised societies.

Theoretical and Practical Implications

This study deepens the theoretical knowledge of how 'otherness' in a paradoxical context of democracy and social division is shaped and experienced in organisational settings. The findings also carry practical implications, as they can serve as a foundation for developing organisational policies and practices at structural, interpersonal, and individual levels to constructively address 'otherness' in similar contexts.

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INTEGRATING BOARD DIVERSITY DIMENSIONS THROUGH COMPOSITE INDICES

Turgut, Gokhan
Université du Québec à Montréal, Montréal, Canada

Keywords: Board diversity, composite indices, governance analytics, multidimensional measurement, board composition

Introduction

Board diversity has become one of the most studied themes in governance research. While early studies focused primarily on gender representation, contemporary governance research examines demographic, human and social capital and structural board characteristics, including ethnicity, nationality, expertise, tenure, board independence and leadership structure. Despite this broadening perspective, board diversity continues to be operationalised largely through isolated indicators, creating fragmentation in measurement and limiting comparability across studies.

Purpose, Aim and Objectives

The purpose of this study is to address measurement challenges in board diversity. The study aims to develop a multidimensional framework for measuring board diversity through composite indices. It seeks to (1) identify limitations of existing diversity measures, (2) define relative diversity variables and advanced diversity indices, and (3) propose a framework capable of integrating multiple board diversity dimensions into a unified measure. The research question is whether multidimensional composite indices can more accurately capture variation in board diversity than traditional additive approaches.

Literature Review and Theoretical Framework

Board diversity research recognises diversity as a multidimensional construct encompassing demographic, human capital and governance dimensions. Agency theory emphasises monitoring mechanisms such as board independence and

leadership structure, while resource dependence theory highlights the value of diverse knowledge, experiences and networks. Recent reviews report mixed empirical findings and identify measurement heterogeneity as a major obstacle to cumulative knowledge development. Existing studies frequently examine diversity variables independently or combine them through additive indices that assume equal contributions across dimensions. This study responds to these concerns by proposing a multidimensional measurement framework based on relative diversity variables and composite indices.

Methodology and Methods

This research adopts a conceptual measurement-development methodology. Relative diversity variables assess board characteristics relative to a comparison population rather than relying solely on absolute measures. Advanced diversity indices integrate multiple diversity dimensions through standardisation and weighting mechanisms, including potential entropy-based approaches. An illustrative example demonstrates how boards with similar gender composition may differ substantially in age, expertise, nationality and governance characteristics.

Main Findings and Contribution

The proposed framework addresses the limitations by integrating demographic, human capital and governance dimensions within a single multidimensional measure. Such indices are expected to improve construct validity, enhance discrimination across firms and support robust empirical testing of board diversity effects.

Originality and Value

The originality of the study lies in reconceptualising board diversity as a measurable multidimensional construct rather than a collection of independent variables. The framework provides a foundation for future governance analytics research and responds directly to longstanding concerns regarding construct clarity and measurement validity.

Research Limitations

The study does not provide empirical validation of the proposed indices. Future research should test the framework using large corporate governance datasets across

different institutional and industry contexts and evaluate alternative weighting and aggregation mechanisms.

Theoretical and Practical Applications and Implications

The proposed framework contributes theoretically by offering a more rigorous operationalisation of board diversity. Practically, composite diversity indices may assist governance analysts, boards of directors, regulators and investors in benchmarking governance quality, evaluating board composition and supporting strategic board renewal decisions.

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COLLECTIVISM VERSUS INDIVIDUALISM: HOW NATIONAL CULTURE MODERATES FINANCIAL RETURNS OF SOCIAL AND ENVIRONMENTAL CSR INITIATIVES

Abdullah Almashayekhi[1]

[1]KFUPM Business School, KFUPM, Dhahran, Saudi Arabia

Keywords: Corporate Social Responsibility, Corporate Financial Performance, Social CSR, Environmental CSR, Collectivism, Individualism, Cross-Cultural Management

Introduction

For decades, the relationship between Corporate Social Performance (CSP) and Corporate Financial Performance (CFP) has been a central focal point in strategic management and international business literature (Margolis and Walsh, 2003; Orlitzky et al., 2003). While a broad empirical consensus suggests that corporate social responsibility (CSR) generally has a positive impact on firm financial performance, treating CSR as a unidimensional construct often obscures the complex mechanisms at play (Shi and Veenstra, 2021). Firms do not invest in a generic, aggregate entity called "CSR"; rather, they allocate capital toward distinct activities, primarily categorized into social initiatives (e.g., labor relations, community development, human rights) and environmental initiatives (e.g., carbon footprint reduction, waste management, resource efficiency). Furthermore, the financial returns of these distinct investments do not occur in an institutional vacuum. They are deeply embedded within national cultural contexts that dictate how external stakeholders perceive, value, and ultimately reward specific corporate behaviors.

Purpose, Aim and Objectives

The primary purpose of this research is to advance understanding of the CSP–CFP relationship by disaggregating CSR into its social and environmental dimensions and investigating how the cultural dimension of collectivism–individualism moderates the relationship between these distinct CSR activities and firm financial performance. The study aims to determine whether

social and environmental CSR initiatives generate distinct financial outcomes and whether these relationships vary according to the level of collectivism or individualism prevailing within a society.

Literature Review and Theoretical Framework

This study utilizes Stakeholder Theory and Hofstede's Cultural Dimensions Theory. Stakeholder Theory posits that a firm's long-term profitability depends on addressing the needs of its constituent groups (DiMaggio and Powell, 1983). However, stakeholder expectations and salience are inherently cultural. In collectivistic societies, emphasis is placed on in-group harmony, relational ties, and mutual dependence. Consequently, stakeholders in these environments are likely to highly value social CSR, as it directly impacts local communities, employee welfare, and social cohesion (Hofstede, 2001). Conversely, in individualistic societies, where autonomy, personal achievement, and explicit contracts prevail, stakeholder relations are more transactional. In these contexts, environmental CSR may yield more potent financial returns. Environmental initiatives often manifest as quantifiable compliance milestones, technological innovations, or eco-efficiencies (e.g., cost reduction through energy savings) that appeal to the strategic, performance-driven mindset of individualistic market actors.

Methodology and Methods

This study will utilize a comprehensive longitudinal dataset for publicly listed companies from several countries of different cultures. The primary source for the environmental and social pillars and firm-specific financial data will be the Refinitiv ESG database (formerly Thomson Reuters ASSET4). For the cultural dimensions, data are obtained from Hofstede insights and relevant academic publications extending Hofstede's work to broader groups of countries.

Originality and Value

This research offers several original contributions to CSR literature. First, it moves beyond the traditional treatment of CSR as a single construct by separating social and environmental dimensions. Second, it introduces culture as a critical boundary condition in the CSP–CFP relationship, addressing calls for greater contextualization in CSR research (Ioannou and Serafeim, 2012). Third, by focusing on collectivism–individualism, the study identifies a cultural mechanism through which stakeholder evaluations influence the financial effectiveness of CSR initiatives.

Implications

This research attempts to demonstrate that stakeholder responsiveness is not static but culturally contingent by showing that the value-creating potential of firm resources (social vs. environmental capabilities) depends heavily on the cultural lens of the external market. For managers, the findings could offer an actionable blueprint for cross-border CSR investing. Rather than implementing a standardized, global CSR policy, companies can strategically adjust their portfolios based on regional culture.

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UNPACKING SDG 12: A SYSTEMATIC REVIEW OF SUSTAINABLE BUSINESS AND CONSUMPTION PRACTICES AND PATHWAYS FORWARD

Eteokleous Pantelitsa[1]; Ellina Polina[1]

[1] School of Business Administration and Digital Technologies, European University Cyprus

Keywords: SDG 12, systematic literature review, sustainable consumption and production, sustainable business models

Introduction

Ten years after the publication of the United Nations Sustainable Development Goals, the United Nations' Secretary- General, António Guterres has recently stated that 'W*ith just five years to reach the Sustainable Development Goals, we need to shift into overdrive'* (UN SDG Report, 2025). This underscores the current slow progress towards achieving the goals by 2030, the need to better understand the causes of this shortfall and to critically identify ways to accelerate progress. Among the seventeen SDGs, SDG 12 seeks to "ensure sustainable consumption and production patterns." Unsustainable consumption and production processes are recognized as major contributors to the planetary crisis, and to a global economy of being only 8.6% circular (UNEP, 2026).

Current State of the Literature

SDG 12 emphasizes how products are designed, produced, marketed, distributed, used, and recovered, as well as how firms coordinate value creation within and across organizational boundaries (Raman et al., 2024). Consequently, a substantial share of SDG12 -related research is found in management and marketing scholarly work (Reppmann et al., 2025). In fact, academic interest in SDG 12 has grown substantially in recent years, resulting in a proliferation of review articles on the topic, editorials, while it has also been the most frequently reported SDG addressed by multinational corporations (Leonidou et al., 2024). Over time, empirical work on SDG 12 has shifted from a predominantly symbolic focus to a more strategic and embedded approach (Grewal et al., 2024).

However, much of this work remains either overly broad or limited to specific SDG12-related topics (e.g., circular economy, sustainable consumer behaviour, or sustainable production) (Minutiello et al., 2024; White et al., 2019). As a result, the development of an integrated understanding of SDG 12's multifaceted scope and impact, is necessary.

Purpose, Aim and Objectives

Using a systematic literature review approach (Tranfield et al., 2003), this study aims to synthesize, critically evaluate, and extend existing knowledge on the role and impact of SDG 12–related literature. It also aims to offer future research directions in an effort to assist in the acceleration of SDG 12 implementation targets.

Methodology

The study follows PRISMA guidelines to ensure a structured and replicable process. Articles are retrieved from the Scopus and Web of Science databases, covering the period from 2016 to 2025, using a predefined search strategy that combines relevant keywords (e.g., circular economy, resource efficiency, sustainable business models). A set of explicit inclusion and exclusion criteria is applied (e.g., peer-reviewed journal articles, published in English) followed by a multi-stage screening process. The final sample is subjected to a systematic coding protocol designed to capture thematic areas, theoretical foundations, methodological approaches, and future research directions (Tranfield et al., 2003).

Contribution

The findings of the study aim to initiate a deeper discussion among researchers providing practical guidelines to managers and policy makers towards their sustainability journey. If companies fail to provide genuinely sustainable products, and consumers lack the awareness, motivation, or willingness to act, the intended impact of SDG 12 cannot be fully materialized (Reppmann et al., 2025).

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RECIPE FOR CIRCULAR ECONOMY TRANSITION IN THE AUTOMOTIVE INDUSTRY: A VIRTUOUS CASE STUDY

Perotti, Francesco Antonio[1, 2]

[1] Department of Management, University of Turin, Torino, Italy

[2] Department of Management and Innovation, University of Agder, Kristiansand, Norway

Keywords: Circular Economy, Remanufacture, Repair, Reuse, Recycle, Automotive, Corporate Sustainability

Positioning and Objectives

Every year, over 4 million vehicles are scrapped while over 12 million new models are introduced to eager consumers in Europe (ACEA, 2025; Eurostat 2025a,b). Due to the generation of scrap metal, batteries, hazardous fluids, plastic, and polymer waste, the automotive industry is highly receptive to circular economy (CE) implementation (Du et al., 2025). Previous studies focused on closing energy and material loops (Aguilar Esteva et al., 2021), capabilities and product innovation (Parmigiani et al., 2022), and supply chain management (Sonar et al., 2022). More specifically, Lin et al. (2021) assessed the implications of corporate sustainability strategy on firm value, recognising a lower priority for high-value corporations. Major car manufacturers are complex entities that remain largely unexplored. An in-depth investigation is needed to identify the most effective mechanisms and processes that enable such high-impact players' transition to a renewable model. Accordingly, this research is based on the following research questions: How to implement CE principles in the automotive industry? How does a major car manufacturer approach the circular transition?

Methodology

Building on the methodological tradition brought about by Eisenhardt (1989) and rooted in an interpretivist philosophical stance (Cornelissen et al. 2021; Welch et al., 2022), this single case study offers a contextualised comprehension of CE transition in the automotive industry. Observing a groundbreaking bottom-up strategy implemented by one of the leading car manufacturers worldwide (Statista, 2026; pending approval to disclose further details), data collection started in 2025 and is expected to continue over the next couple of years. Data is collected through in-person and online interviews with logistics and sustainability managers, as well as senior managers directly involved in a hub set up specifically to coordinate circular

processes. Primary sources consist of five open-ended interviews with representatives from the company's Italian subsidiary and direct observation of a circular hub, complemented with secondary information from the car manufacturer's websites and corporate communications, company public reports, informative articles, media, and confidential documents. In the coming months, I plan to involve managers overseeing new circular facilities in other countries.

My interpretive perspective relies on sensemaking, specifically involving a process analysis based on data coding across multiple phases. Transparent and reliable interpretation is ensured by involving participants in data interpretation and conceptual validation, cross-checking factual data, and corroboration (Gibbert et al., 2008; Yin, 2009).

Preliminary Findings

This case study provides insight into an automotive group pursuing sustainable and economic growth. The car manufacturer has been implementing a bottom-up strategic approach based on three phases: a) launching a pilot hub as a standardisable circular unit; b) replicating the circular hub across multiple countries worldwide; and c) scaling up the initiative to build a global network of circular hubs. Overall, this abstraction provides a framework for integrating circular processes within complex, high-impact industries such as the automotive.

As of 2023, the first circular hub has been designed to implement four specific circular processes to "extend vehicles and parts lifespan" and "reduce waste by returning used materials in the manufacturing loop for new vehicles and parts", as outlined by a senior manager who oversaw its launch. Late 2025, its success is attributable to an innovative modular operational layout, employees' specialised expertise, an integrated network of stakeholders (enabling waste sourcing and recycling), and ad-hoc market channels. The ongoing second phase is yielding insights about circular hub standardisation and replicability in other countries.

Contribution and Implications

The originality of this study lies in its processual explanation of how circularity is implemented inside a major car manufacturer. Represented by a three-step model, this strategic bottom-up approach to CE transition will further academic awareness and inform managers from the automotive industry and, more broadly, leaders operating in large, resource-intensive sectors.

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DIGITAL TECHNOLOGIES FOR SUSTAINABLE LOGISTICS: A SYSTEMATIC LITERATURE REVIEW

Derkach, Vadym; Paužuolienė, Jurgita

Management and Economics Department, Klaipeda university, Klaipeda, Lithuania

Keywords: Digitalization; Sustainable Logistics; Artificial Intelligence; Blockchain; Supply Chains; PRISMA.

Abstract

Purpose – The purpose of this study is to systematically review the scientific literature on digital technologies in logistics in order to evaluate their contribution to sustainable logistics development.

Design/methodology/approach – To understand how digital technologies are currently applied, this study reviews 35 academic publications that examine the role of digital technologies in sustainable logistics. The review follows the PRISMA approach and evaluates the literature through TCM framework: the theories that guide current research, the contexts in which digital tools are implemented, and the methods used to study them.

Findings – Digital technologies consistently improve operational efficiency, transparency, emissions monitoring, and supply chain resilience. However, the literature remains theoretically and methodologically fragmented. Circular Economy and Supply Chain Resilience dominate, while institutional, governance, and behavioral perspectives receive limited attention. Research focuses mainly on technological and operational contexts, and modelling and quantitative methods prevail over qualitative, mixed-method, and longitudinal studies.

Practical implications – The review suggests that organisations should integrate digital technologies into broader sustainability strategies supported by organisational capabilities, collaboration, and governance. For researchers, the findings highlight the need for broader theoretical perspectives and more qualitative, mixed-method, and longitudinal research to strengthen evidence on how digital technologies contribute to sustainable logistics.

Originality/value – The paper contributes to the literature by providing an integrative synthesis of research on digital technologies for sustainable logistics through the Theory–Context–Method framework. It shows that, despite considerable progress in developing technological solutions, the field remains fragmented theoretically, contextually, and methodologically.

Introduction

Sustainability has become a key issue in logistics and supply chain management. Transport activities are closely linked to pollution, energy use and environmental impact due to not sustainable fuel usage. At the same time, logistics systems face growing regulatory pressure and higher expectations related to transparency and accountability. Because of this, sustainability in logistics is increasingly treated not only as an operational issue, but also as a strategic and governance-related concern (Rusch et al., 2023).
Digital technologies are often discussed as tools that can support sustainability goals in logistics. Recent research focuses on artificial intelligence, Blockchain, the Internet of Things, Big Data analytics, Cloud-based systems and Digital platforms. These technologies are applied to improve information sharing, coordination and decision-making across supply chains (Kastelan et al., 2024; Nasereddin, 2024). Several studies show that better data availability and system integration can support efficiency improvements, emissions reduction and more effective resource management (Jia, 2025).
Blockchain-based solutions receive particular attention in the literature. Many studies highlight their role in improving transparency, traceability and trust between supply chain actors. These aspects are considered especially important in complex logistics systems involving multiple organizations and information asymmetries (Ebinger and Omondi, 2020). In parallel, research on artificial intelligence and advanced analytics focuses on optimization, forecasting and risk management applications (Habazin et al., 2025). For instance, Arsenio et al. (2026) highlight the co-evolution of intermodal transport research and technological innovation toward green and intelligent logistics systems, while Cao and Tao (2025) demonstrate that collaborative governance mechanisms in supply chains are essential for achieving sustainability through aligned incentives among stakeholders.
Despite the growing number of studies, the literature remains fragmented. Many papers rely on Circular Economy or Supply Chain Resilience frameworks, particularly in studies addressing Industry 4.0 and digital transformation (Ali et al., 2024; Gürpinar and Gulum, 2025). In contrast, institutional, governance and behavioral perspectives are addressed less frequently. As a result, organizational practices, regulatory conditions and stakeholder behavior are often treated as secondary factors.
Methodological differences further contribute to this fragmentation. Quantitative modelling, optimization techniques and machine-learning methods dominate the field. These include topic modelling, collaborative optimization, digital twin simulation and deep learning approaches (Aerts and Mathys, 2024; Hirata et al., 2024; Jia, 2025). While these methods provide detailed insights into technical performance, qualitative and mixed-method studies remain limited, even though they are important for analyzing governance structures, collaboration and implementation challenges (Vincek et al., 2023).

Purpose and objectives

The purpose of this study is to systematically review the scientific literature on digital technologies in logistics in order to evaluate their contribution to sustainable logistics development. The objectives of

the study are: to analyze the dominant themes and research trends in the field of digital technology applications in sustainable supply chains; to identify the main theoretical frameworks that explain the role of digital technologies in sustainable logistics; to identify contexts in which digital technologies are used to improve environmental performance; to systematize research methods used on sustainability of logistics.

Methodology

To examine the development of research on digital technologies for sustainable logistics, a structured review of the scientific literature was conducted. When a research field grows rapidly and becomes fragmented, systematic and bibliometric approaches are widely used to organize existing knowledge, identify dominant research streams and highlight gaps for future studies (Tranfield et al., 2003; Zupic and Cater, 2015). Therefore, this study was carried out in two stages: a quantitative bibliometric analysis and a qualitative systematic literature review.

The bibliometric stage focused on the general characteristics of the literature. This included publication trends, thematic focus and methodological tendencies. Bibliometric analysis enables researchers to assess the structure and evolution of a research field using quantitative indicators and has been widely applied in management and sustainability research (Paul et al., 2021). In this study, bibliometric insights were used to support the systematic analysis and to provide an overview of the selected body of literature.

The systematic literature review followed the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). PRISMA provides a transparent and replicable procedure for documenting search strategies, screening processes and inclusion decisions (Page et al., 2021).

To organize the review findings, the Theory–Context–Methodology (TCM) framework was applied. The TCM framework allows a structured analysis of theoretical perspectives, application contexts and research methods within a field and is commonly used in management-oriented systematic reviews (Tranfield et al., 2003). The review was designed to answer the following research questions:

RQ1: What dominant research directions and author keyword structures are revealed in the scientific literature on the role of digital technologies in in logistics and supply chain research

RQ2: Which theoretical frameworks in sustainable digital logistics most commonly underpin research on the application of digital technologies in sustainable logistics and supply chains?

RQ3: In which contexts are digital technologies examined when addressing sustainability and environmental performance in logistics?

RQ4: What research methods are used to assess the impact of digital technologies on sustainability performance of logistics systems?

To answer the research questions, the Scopus and Web of Science Core Collection databases were selected as the main sources of scientific literature. Both databases are widely recognised for their comprehensive coverage of peer-reviewed journals in the fields of social sciences, management, sustainability and transportation research (Kumpulainen and Seppänen, 2022).

In Scopus and Web of Sciences, the literature search was conducted using a predefined query applied to titles, abstracts and keywords. The search string was developed using the following keywords: ((“artificial intelligence” OR AI OR “machine learning” OR “deep learning”) AND (Blockchain OR “distributed ledger technology” OR DLT OR “smart contracts”) AND (logistics OR “supply chain” OR freight OR transportation) AND (sustainability OR “carbon reduction” OR “energy efficiency” OR “green logistics”))

The search was limited by the following criteria: the articles from 2018-2026 year and only documents published in English were included. The analysis was limited to journal articles, while book chapters, conference papers and articles in press were excluded. Relevant subject areas included Business, Management and Accounting, Environmental Sciences, Energy, Economics, and Transportation. Graphical representation of the article screening and selection process is depicted in Figure 1.

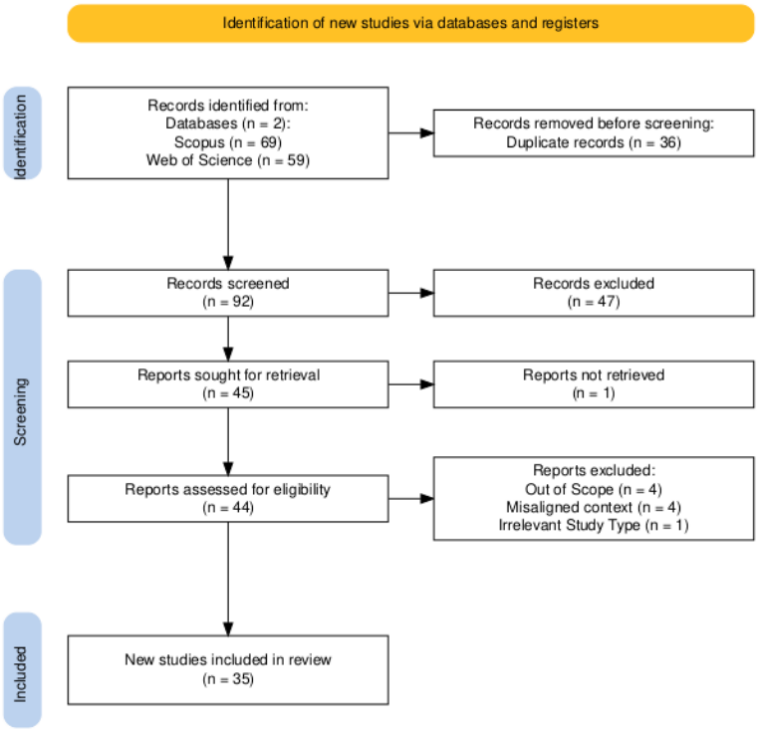


Figure 1: *The article screening and selection process*

After completing the selection procedure and removing duplicates, 35 peer-reviewed articles were retained for further analysis. VOSviewer software (version 1.6.20) was used for bibliometric mapping and visualization of publication patterns, keyword co-occurrence and research clusters. Following established practices in systematic and bibliometric reviews, the selected studies were first screened

through their abstracts and conclusions and subsequently analyzed through a detailed examination of the full texts.

Data Collection and Analysis

Digital Technologies and Sustainability-Related Terminology in Logistics and Supply Chain Research

The analysis of the selected articles identified a wide range of author keywords related to digital technologies and sustainability in logistics and supply chain management. Some keywords were sector-specific or application-oriented (e.g., green logistics, transportation, cold chain) and did not directly refer to digital technologies. Other frequently used terms were generic (e.g., supply chain management, logistics systems) and were therefore excluded from the analysis.

After filtering, keywords directly related to digital transformation were retained. To avoid duplication, singular and plural forms were treated as equivalent. Among the retained terms, “artificial intelligence”, “Blockchain”, and “Internet of Things” were the most frequently used, followed by “big data analytics”, “machine learning”, and “digitalisation”. These keywords were commonly linked to sustainability-related concepts such as emissions reduction, transparency, energy efficiency and resilience. In addition, several studies used broader terms, including “smart technologies”, “digital platforms”, and “digital twins”, indicating variation in terminology and a lack of standardised language within the field (Figure 2).

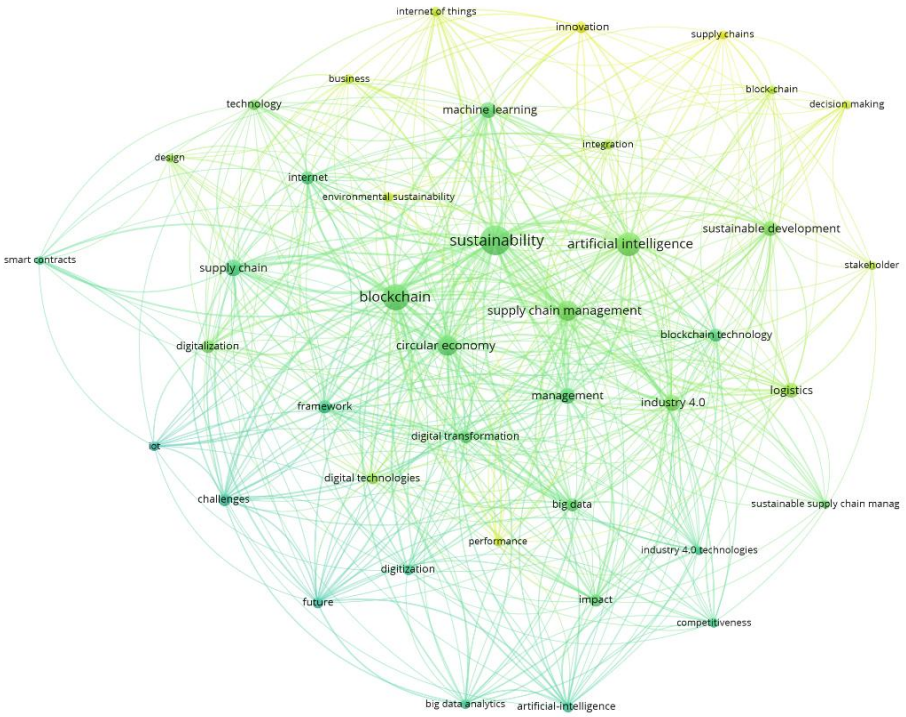


Figure 2: *Authors keywords representing digital technologies and sustainability-related terminology in logistics and supply chain research*

Theoretical Frameworks in Sustainable Digital Logistics

A variety of theoretical frameworks underpin research in every field. The analysis of the selected articles revealed that several theories were explicitly identified and applied by the authors. In total, 15 theoretical frameworks were directly named in the analysed studies and are summarised in Table 3**.**

Theoretical framework	Frequency in analysed articles	Role and contribution in the literature
Circular Economy	17	The dominant theoretical framework linking digital technologies to resource efficiency, closed-loop supply chains, waste reduction and emissions mitigation. Technologies are positioned as enablers of circular flows and data-driven optimisation.
Supply Chain Resilience	15	Used to explain how digital technologies enhance visibility, risk sensing, adaptability and recovery in logistics systems, often in connection with sustainability and disruption management.
Corporate Social Responsibility	9	Applied to justify transparency, accountability and responsible practices in digitally enabled supply chains, particularly in relation to stakeholder expectations and ethical sourcing.
Trusted Data Sharing	9	Focuses on the role of digital technologies, especially Blockchain, in enabling secure, reliable and verifiable information exchange among supply chain actors to support sustainability objectives.
Technology Acceptance Model (TAM)	5	Explains organisational and managerial adoption of digital technologies in logistics, emphasising perceived usefulness, ease of use and trust.
Resource Availability	6	Addresses how digital technologies improve the monitoring, allocation and efficient use of physical and informational resources within logistics systems.
Triple Bottom Line	4	Used to frame sustainability outcomes across environmental, social and economic dimensions, often in conjunction with digital performance measurement tools.
Institutional Theory	4	Highlights the influence of regulatory pressure, standards and institutional environments on the adoption of digital technologies for sustainable logistics.
Environmental Awareness	4	Reflects studies emphasising the role of digital tools in increasing awareness of environmental impacts and supporting environmentally responsible decision-making.
Connectionism	3	Appears in studies applying data-driven and learning-based models to capture complex interdependencies in logistics systems and digital networks.
Dynamic Capabilities Framework	2	Explains how organisations reconfigure digital resources and capabilities to adapt to sustainability challenges and changing logistics environments.
Knowledge Transfer	2	Used to analyse learning processes and information feedback loops enabled by digital platforms and data-sharing systems in supply chains.
Ecosystem Approach	2	Frames logistics and supply chains as interconnected ecosystems where digital technologies support coordination among multiple actors and institutions.
Entrepreneurial Ecosystem	2	Applies ecosystem logic to examine innovation, digital transformation and sustainability-driven entrepreneurship in logistics and supply chain contexts.
ESG-Driven Supply Chain Sustainability	2	Uses ESG as a lens to assess environmental, social and governance performance supported by digital transparency and reporting tools.
Collaborative Governance	1	Examines governance mechanisms that coordinate multiple stakeholders through digital platforms to achieve sustainability objectives.
Sustainable Supply Chain Transparency	1	Focuses on transparency as a specific sustainability mechanism enabled by digital traceability technologies.
Social Responsibility (general)	2	Addresses broader social responsibility considerations beyond formal CSR frameworks in digital logistics systems.

Table 1: *Theoretical frameworks derived from keyword co-occurrence analysis in sustainable logistics research*

The identified theoretical frameworks were applied by the authors to analyse various aspects of digital technology adoption and sustainability performance in logistics and supply chain management. However,

not all theoretical perspectives relevant to the field were explicitly named in the analysed studies. This indicates that the theoretical development of research on digital technologies for sustainable logistics remains incomplete and that further opportunities exist to apply additional theoretical lenses in future research.

Further keyword analysis enabled the identification of multiple keywords representing different theories, models and conceptual frameworks used in the literature. As illustrated in Figure 3, early research in the field primarily focused on efficiency improvement, transparency and information reliability in digitally enabled logistics systems. Subsequent studies extended this focus towards resilience, resource allocation and governance mechanisms within supply chains. More recent research trends have expanded to include institutional environments, ecosystem-based perspectives, knowledge transfer and capability development, reflecting a growing interest in organisational and systemic dimensions of digital transformation for sustainability.

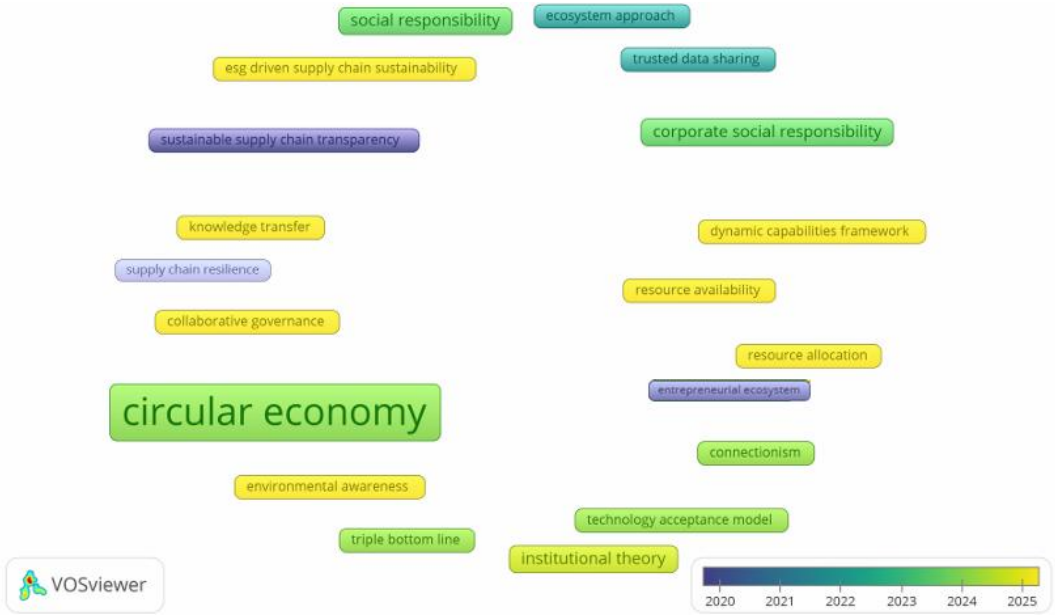


Figure 3: *Co-occurrence network of theoretical frameworks in research on digital technologies for sustainable logistics*

Research Contexts in Studies on Digital Technologies for Sustainable Logistics

The analysis was conducted to identify the main research contexts and directions in studies on digital technologies for sustainable logistics and supply chain management. In total, 196 author and index keywords were extracted from the selected articles. Based on the systematic grouping of keywords and their co-occurrence patterns, six main research contexts were identified and visualised using VOSviewer. These contexts include technological innovation and digital infrastructure, sustainability and green or circular supply chain management, supply chain and logistics operations, risk, resilience and governance, organisational and strategic management, and sectoral or industry-specific applications. Together, they

show that research on digital technologies for sustainable logistics integrates technological, sustainability, operational, governance and strategic perspectives.

To provide a more detailed overview of the identified research contexts, the keywords were further organised into thematic groups. Table 2 presents six main contexts derived from the keyword co-occurrence analysis, with reference to scientific sources. This classification illustrates how digital technologies for sustainable logistics are examined across technological, environmental, operational, governance, strategic and sector-specific dimensions in the existing literature.

Context	**Authors**
Technological innovation & digital infrastructure	Ali et al. (2024); Alkhodair & Alkhudhayr (2025); Faisol et al. (2025); Hirata et al. (2020); Jia (2025); Liu et al. (2024); Malik et al. (2026); Nasereddin (2024); Tsymbal et al. (2023); Wong et al. (2021); Wong et al. (2023); Yang et al. (2023)
Sustainability & green / circular SCM	Ali et al. (2024); Alkhodair & Alkhudhayr (2025); Cao & Tao (2025); Ebinger & Omondi (2020); Faisol et al. (2025); Fareed et al. (2024); Fatorachian & Kazemi (2025); González-Cancelas et al. (2025); Gürpinar & Gulum (2025); Javed et al. (2024); Khan et al. (2022); Rajkiran & Almeida (2024); Rusch et al. (2023); Wong et al. (2021); Wong et al. (2023); Zaid et al. (2025)
Supply chain & logistics operations	Alkhodair & Alkhudhayr (2025); Apruzzese et al. (2023); Arsenio et al. (2026); Cao & Tao (2025); Elghomri et al. (2025); Fareed et al. (2024); Fatorachian & Kazemi (2025); González-Cancelas et al. (2025); Gürpinar & Gulum (2025); Hirata et al. (2020); Hirata et al. (2024); Hordieiev et al. (2025); Javed et al. (2024); Jia (2025); Khan et al. (2022); Leung (2025); Malik et al. (2026); Marić et al. (2024); Nasereddin (2024); Vincek et al. (2023); Yang et al. (2023); Zaid et al. (2025)
Risk, resilience & governance	Ebinger & Omondi (2020); Elghomri et al. (2025); Gürpinar & Gulum (2025); Javed et al. (2024); Khan et al. (2022); Rasshyvalov et al. (2025)
Organizational & strategic management context	Apruzzese et al. (2023); Arsenio et al. (2026); Elghomri et al. (2025); Fareed et al. (2024); Hirata et al. (2024); Kastelan et al. (2024); Leung (2025); Nasereddin (2024); Rajkiran & Almeida (2024); Zaid et al. (2025)
Sectoral / industry-specific context	Ali et al. (2024); Cao & Tao (2025); Marić et al. (2024); González-Cancelas et al. (2025); Vincek et al. (2023); Arsenio et al. (2026)

Table 2: *Research contexts in studies on digital technologies for sustainable logistics*

The most frequently occurring keywords were visualised to highlight their co-occurrence relationships and temporal distribution (Figure 4).

The analysis identified six main research contexts in studies on digital technologies for sustainable logistics, ranging from technological innovation to sustainability, operations, governance and sector-specific applications. These contexts indicate that the field extends beyond purely technological perspectives and increasingly incorporates organizational and environmental considerations.

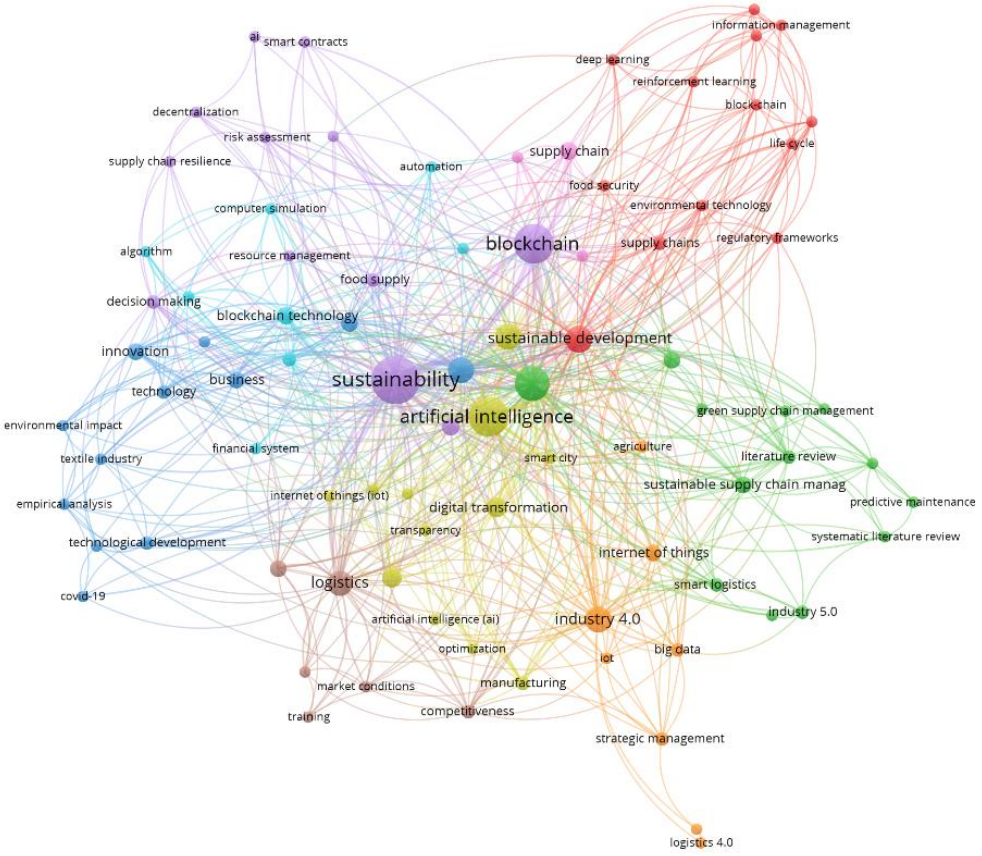


Figure 4: *Keyword co-occurrence network illustrating research contexts in digital technologies for sustainable logistics*

Research Methods in Studies on Digital Technologies for Sustainable Logistics

Like many emerging research domains, studies on digital technologies for sustainable logistics employ a wide range of research methods and methodological combinations. A detailed analysis of the selected articles reveals substantial methodological diversity, although the field remains unevenly balanced.

The most frequently applied approaches were experimental and modelling-based methods (22 articles) and literature-based or theoretical methods (22 articles). These include systematic literature reviews, bibliometric analyses, PRISMA-based reviews and conceptual modelling. Quantitative empirical methods were identified in 14 articles, primarily relying on surveys and statistical techniques such as structural equation modelling (SEM and PLS-SEM). Within this group, fuzzy and fsQCA-type methods were applied in three studies, indicating limited use of configurational approaches.

Case study methods were employed in six articles, mainly to examine technology implementation, Blockchain integration and smart contract applications in logistics contexts. In contrast, mixed or multi-method designs appeared in only two studies, suggesting that methodological triangulation remains relatively rare in the field.

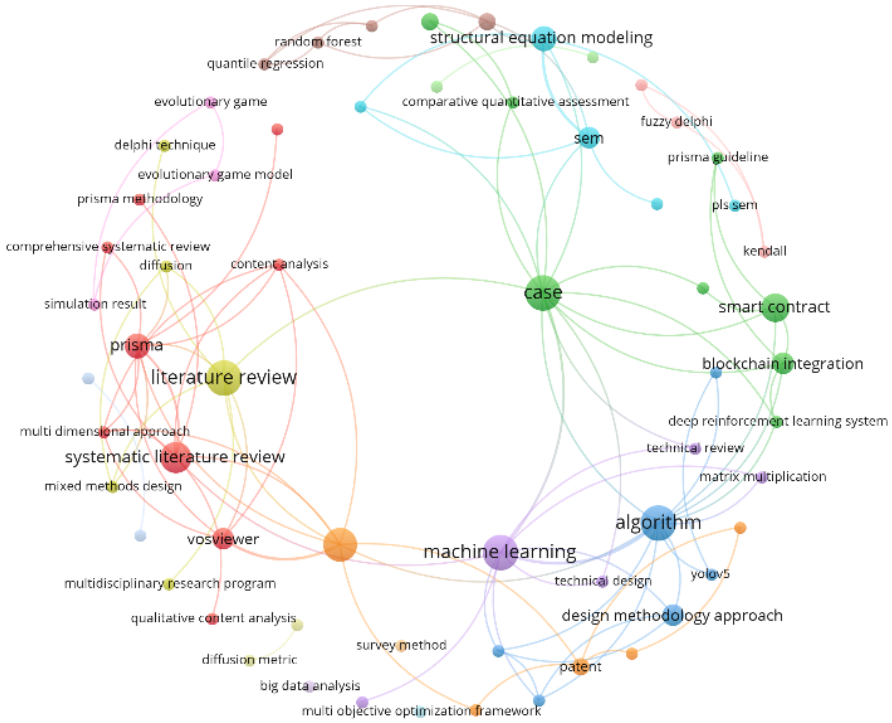


Figure 5: *Network of used research methods in studies on digital technologies for sustainable logistics*

The VOSviewer-based keyword analysis further confirms the dominance of machine learning, algorithmic design, optimisation models and simulation-based approaches, alongside systematic literature review and bibliometric techniques (Figure 5).

Overall, while the field demonstrates strong analytical and modelling capabilities, empirical qualitative and mixed-method studies are underrepresented. This indicates that research on digital technologies for sustainable logistics is not yet methodologically balanced and would benefit from more integrative and comparative empirical designs.

Findings and Discussion

The findings show that research on digital technologies for sustainable logistics is technologically advanced but remains uneven across the Theory, Context, and Method dimensions. Figure 6 therefore presents the TCM framework not as three independent classifications, but as an interconnected structure. The theoretical frameworks determine how the contribution of digital technologies is explained, the research contexts specify where this contribution is examined, and the research methods determine which relationships and sustainability outcomes can be demonstrated.

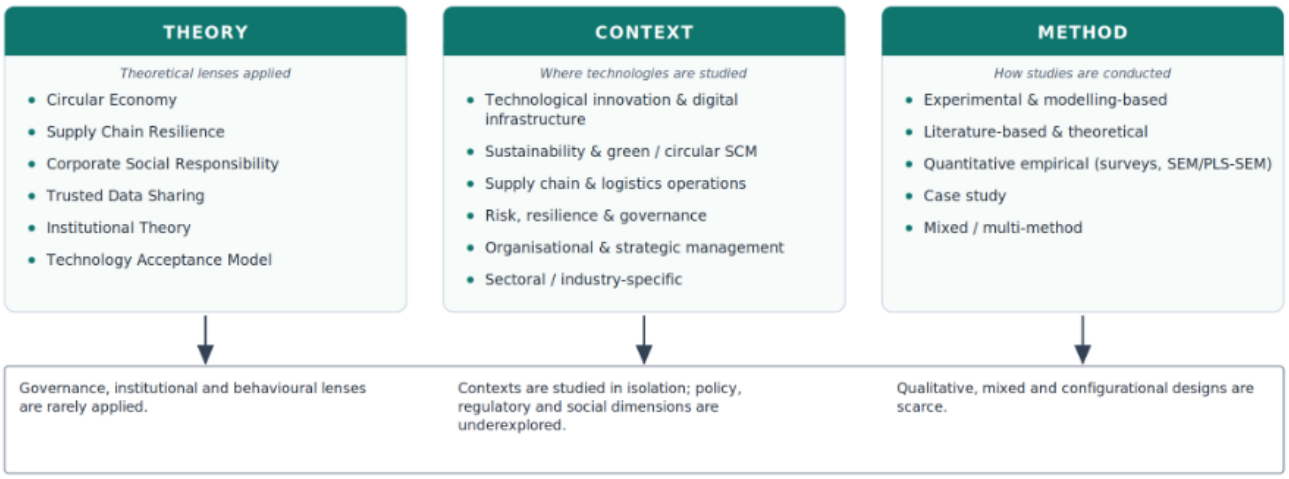


Figure 6: *TCM framework for digital technologies enhancing sustainability in logistics*

Within the Theory dimension, Circular Economy and Supply Chain Resilience dominate because both frameworks correspond closely to measurable outcomes such as resource efficiency, waste reduction, visibility, adaptability, and recovery. Circular Economy is particularly relevant to studies of green or circular supply chain management, while Supply Chain Resilience is widely applied in research on risk, resilience, and governance (Gürpinar and Gulum, 2025; Javed et al., 2024). Corporate Social Responsibility, Trusted Data Sharing, and Sustainable Supply Chain Transparency further explain how digital technologies support accountability, information reliability, and responsible supply chain practices (Ebinger and Omondi, 2020; Wong et al., 2021). However, Institutional Theory, Technology Acceptance Model, Dynamic Capabilities Framework, Collaborative Governance, and ESG-Driven Supply Chain Sustainability remain less frequently applied, even though they are important for explaining regulation, adoption, organisational adaptation, stakeholder coordination, and governance (Cao and Tao, 2025; Fatorachian and Kazemi, 2025; Zaid et al., 2025).

The Context dimension includes technological innovation and digital infrastructure; sustainability and green or circular supply chain management; supply chain and logistics operations; risk, resilience, and governance; organisational and strategic management; and sectoral or industry-specific applications. These contexts demonstrate the broad relevance of digital technologies, but they are often analysed separately. Studies of ports, maritime logistics, cold chains, food supply chains, and transport systems provide detailed evidence within individual settings, yet they less frequently connect operational performance with organisational, regulatory, and institutional conditions (Habazin et al., 2025; Kastelan et al., 2024; Marić et al., 2024). As a result, digital technologies are often treated as technical instruments rather than as elements of wider organisational and governance systems.

The Method dimension helps explain this fragmentation. Experimental and modelling-based methods and literature-based or theoretical methods dominate, while quantitative empirical studies mainly use

surveys, SEM, and PLS-SEM. Case studies, fuzzy and fsQCA-type methods, and mixed or multi-method designs remain limited. Although modelling, optimisation, machine learning, and simulation are effective for analysing route planning, resource allocation, and network performance (Hirata et al., 2024; Jia, 2025; Yang et al., 2023), they are less suitable for examining organisational resistance, stakeholder behaviour, institutional pressure, collaboration, and technology acceptance. This methodological imbalance restricts the application of Institutional Theory, Technology Acceptance Model, Dynamic Capabilities Framework, and Collaborative Governance.

The TCM dimensions therefore reinforce one another. Experimental and modelling-based methods favour measurable theories such as Circular Economy and Supply Chain Resilience and are concentrated in technological innovation and digital infrastructure and supply chain and logistics operations contexts. Greater use of case studies, qualitative analysis, fuzzy and fsQCA-type methods, and mixed or multi-method designs could strengthen research on organisational and strategic management, risk, resilience, and governance, and sectoral or industry-specific applications.

Despite these limitations, the reviewed studies associate the Internet of Things with real-time visibility, Blockchain with traceability and Trusted Data Sharing, and artificial intelligence with forecasting, route planning, and resource optimisation (Malik et al., 2026; Jia, 2025). However, their sustainability effects depend on data quality, organisational readiness, process integration, knowledge transfer, and cooperation among supply chain actors (Nasereddin, 2024; Gürpinar and Gulum, 2025; Zaid et al., 2025).

Conclusions

This study set out to review the scientific literature on digital technologies in logistics and to assess their contribution to the development of sustainable logistics. Across the 35 articles examined, that contribution is real but uneven: digital technologies are consistently associated with gains in efficiency, transparency, emissions monitoring, and resilience, yet the research documenting them is technically advanced while remaining fragmented in its conceptual and methodological foundations.

The dominant themes centre on artificial intelligence, blockchain, and the Internet of Things, followed by big data analytics, machine learning, and digitalisation, most often linked to emissions reduction, transparency, energy efficiency, and resilience. The field has also shifted over time — from an early concern with efficiency and information reliability, toward resilience and resource allocation, and more recently toward institutional, ecosystem, and capability-related questions — signalling a growing, if still partial, interest in the organisational dimensions of digital transformation.

Among the theoretical perspectives, Circular Economy and Supply Chain Resilience clearly dominate, with Corporate Social Responsibility and trusted data sharing also recurring, whereas institutional, governance, and behavioural lenses are applied only rarely — even though they are central to

understanding regulation, adoption, and implementation. The theoretical base supporting the field is therefore narrower than the breadth of its technologies would suggest.

Digital technologies are examined across six broad contexts — technological innovation and infrastructure, sustainability and green or circular supply chain management, logistics operations, risk and governance, organisational strategy, and sector-specific applications. These contexts are most often studied in isolation, and technical and operational settings receive far more attention than policy, regulatory, and social dimensions, which limits an integrated view of how the technologies improve environmental performance.

Methodologically, the field relies heavily on modelling and experimental work and on literature-based and theoretical studies, supported by quantitative empirical designs such as structural equation modelling; case studies are less frequent, and mixed or multi-method designs are rare. The questions best suited to qualitative and configurational approaches — governance, collaboration, and implementation — therefore remain underexplored.

These findings expose several gaps that should guide future work: broader theoretical engagement with institutional, governance, and behavioural perspectives; greater methodological balance through qualitative, mixed, and configurational designs; closer integration across research contexts rather than single-setting studies; and empirical validation of technology–outcome relationships using field and longitudinal data. The review draws on a focused sample from two databases and a keyword-based reading, so its results indicate emphasis rather than an exhaustive account; even so, by organising the evidence through the Theory–Context–Method framework, it provides a structured basis for more coherent future research and for closer alignment between digital innovation, organisational practice, and sustainability objectives in logistics.

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COLLECTIVE AGENCY AND "CRITICAL YEAST" IN REGENERATIVE TOURISM TRANSITIONS: EARLY PROCESS EVIDENCE FROM SIX MEDITERRANEAN PILOT REGIONS

Berložnik, Janja[1]; Logar, Erik[2]

[1]Anton Melik Geographical Institute, ZRC SAZU, Ljubljana, Slovenia

[2]Anton Melik Geographical Institute, ZRC SAZU, Ljubljana, Slovenia

Keywords: regenerative tourism; collective agency; critical yeast; destination governance; Mediterranean; Regenera4MED

Regenerative tourism seeks to restore the social-ecological conditions that support long-term place wellbeing, moving beyond impact mitigation (Bellato and Pollock 2025). Grounded in an ecological worldview that recognises complex adaptive living systems (Bellato and Pollock 2025; Farsari 2023), it requires transformation in mindsets, stakeholder roles, governance, and practices (Dredge 2022; Bellato et al. 2022). Despite increased attention in policy and practice (Iddawala and Lee 2026), additional empirical research on implementation through collaborative governance and collective action is required (Bellato and Pollock 2025). Collective agency is therefore central to social–ecological transformation (Charli-Joseph et al. 2023).

This study offers preliminary insights from an ongoing EU-funded regenerative tourism initiative in six Mediterranean pilot regions that applies a multi-stakeholder governance model (Regenera4MED 2025). It investigates the emergence of collective agency in small, strategically connected 'critical yeast' groups (Lederach 2005) and their influence on regenerative transitions. Specifically, the analysis addresses: 1) how strategic connectedness, relational spaces, and perspective shifts shape collective agency; 2) conditions that nurture trust, shared purpose, legitimacy, and collective action; and 3) how these groups engage with wider systems.

Collective agency is inherently relational (Emirbayer and Mische 1998). It is defined as a socially produced capacity to pursue shared goals through interaction, capability building, and coordinated action (Pelenc, Bazile and Ceruti 2015). Reframing and the development of shared

meaning are identified as key processes that enable collective agency (Charli-Joseph et al. 2023). Drawing on this relational perspective, Lederach's (2005) concept of 'critical yeast' serves as an analytical lens to explore how small, strategically connected groups can influence wider systems by generating self-sustaining transition processes through shared meaning, relationship bridging, and collective action.

This comparative qualitative study uses semi-structured interviews, reflective self-assessment, and project documentation from the six pilot regions. Triangulation, process tracing, and cross-case comparison identify mechanisms and emerging patterns of agency.

The analysis compares the formation of 'critical yeast' groups, mechanisms supporting collective agency, and conditions influencing trust, shared purpose, legitimacy, and action within Mediterranean governance. It also examines relationships between these groups and broader systems, providing cross-case evidence on early collective agency development and advancing understanding of transition as a relational process before system-level outcomes emerge.

The findings are preliminary and context-specific. Future research will evaluate whether early emergent collective agency persists or changes over time. For policy and practice, support should extend beyond stakeholder representation to support facilitation, trust-building, mindset shifts, shared meaning, role clarity, and new interconnectedness between pilot groups and broader systems.

Regenerative tourism transitions depend on collective agency among diverse actors, grounded in shared meaning and regenerative mindset. The 'critical yeast' theory helps identify mechanisms and conditions that support the emergence of collective agency, and its influence on wider system-level transitions.

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BEYOND GLOBAL CHALLENGES: DE-ESCALATING SURGICAL ANXIETY AND REDUCING LIABILITY COSTS THROUGH AN ALGORITHM FOR MINDSET-TAILORED INFORMED CONSENT

Gabay, Gillie[1]; Attila, Gere[2]; Glenn, Zemel[3]; Moskowitz, Howard[4]

1Faculty of Sciences, Achva Academic College, Arugot, Israel

2 Hungarian University of Agriculture and Life Sciences, Budapest, Hungary

3 Independent Researcher, Illinois, USA

4 Mind-Genomics Associates, White Plains, New York, USA

Keywords: Algorithm; Anxiety pre-surgery; Conjoint Analysis; Health management; Informed consent; Lawsuits; Patient-Centered Care; Surgeries.

Introduction

Informed consent (IC) before surgery is a legal procedure designed to promote well-being and trust. Currently, however, IC heightens preoperative anxiety and contributes to rising malpractice claims and vast prelitigation costs. Interventions increase patient knowledge rather than address emotional distress, highlighting a critical gap in surgical care.

Purpose, Aim, and Objectives

To identify messages that heighten or reduce preoperative anxiety in IC, segment patients into distinct mindsets, and develop a predictive algorithm to tailor IC communication by patient mindset-belonging.

Literature Review and Theoretical Framework

The patient-centered care framework calls for providing care that responds to patients' needs (Gabay & Bokek-Cohen, 2022). Elevated preoperative anxiety impairs immune function and delays recovery (Ahmad et al., 2026). Courts ruled against hospitals in 71% of cases (Giudici-Wach et al., 2022). Lawsuits often stem from preventable communication failures contributing to a $55.6 billion U.S. medical liability burden (Ghonim et al., 2025). Patient-centered IC can

reduce anxiety (Nsaful et al., 2026). Empirical research on preoperative anxiety, however, remains limited (Dutta, 2026).

Materials and Methods

A conjoint-based experiment was conducted with a sample of 104 U.S. adults who had undergone surgery within the preceding six months. Participants evaluated 48 randomized combinations of IC messages across six categories, yielding 4,992 total evaluations. Ratings were recorded on a 9-point scale and recoded into binary metrics to crystallize changes in anxiety. Ordinary least-squares regression determined the utility impact of individual messages. K-means clustering was applied to segment respondents into distinct mindsets.

Results

Three statistically distinct mindsets emerged. Mindset 1 (Tailored Information Seekers, 63%) experienced lower anxiety when receiving tailored, condition-specific information and clear explanations. Mindset 2 (Patient-Centered Protection Seekers, 18%) exhibited heightened anxiety when facing generic forms, dense terminology, or rushed conditions, and reduced anxiety when surgeons explicitly affirmed that IC exists to protect them and invited open questions. Mindset 3 (Anxiety-Vulnerable Patients, 19%) displayed elevated baseline anxiety across nearly all parameters (medical jargon, feeling rushed, lack of clarity regarding procedures). We developed a predictive algorithm to classify patients into mindsets based on a set of discriminating message choices.

Findings and Contribution

Standardized, generic IC disclosures can unintentionally exacerbate patient distress. The predictive algorithm allows surgeons to rapidly detect the patient's mindset, align the dialogue with the patient's needs, and reduce operative anxiety.

Originality and Value

This study identified three distinct patient mindsets (Tailored Information Seekers, Patient-Centered Protection Seekers, and Anxiety-Vulnerable Patients). Methodologically, this research introduces an innovative conjoint-based experimental design to quantify the precise

anxiety-inducing or anxiety-reducing impact of messages. A novel, field-deployable predictive algorithm was developed, enabling clinicians to rapidly classify a patient's mindset-belonging before surgery and communicate accordingly. Clinically and managerially, this approach offers health systems a scalable framework to reduce malpractice exposure, lower preoperative distress, improve recovery metrics, and advance patient-centered care.

Limitations

Mindsets are influenced by cultures, limiting generalizability and expectations by medical specialty, which may yield different mindsets and message priorities weren't tested.

Theoretical and Practical Applications

Incorporating predictive algorithms into surgical practice represents a low-cost, high-impact strategy to enhance patient-centered care and mitigate malpractice exposure.

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STRUCTURAL AMBIDEXTERITY IN ACADEMIC ENTREPRENEURSHIP: THE ROLE OF INTERNAL BROKERAGE AND TOPIC DYNAMICS

Pucci, Tommaso[1]; Massacci, Alberto[1]; Benvenuti, Caterina[2]; Zanni, Lorenzo[1]

[1]Department of Business and Law, University of Siena, Siena, Italy

[2]Department of Economics and Management, University of Florence, Florence, Italy

Keywords: Ambidexterity; Knowledge recombination; Life Science; Network; Topic dynamics.

Track No: (13) Healthcare Management

Introduction

The ability to transform academic research and knowledge into entrepreneurial activity represents a crucial aspect of the University's "third mission". This study explores the impact of scientists' collaboration networks and their research topic dynamics over time to understand what drives success in technology transfer activities.

Purpose, Aim and Objectives

This study aims to understand the cognitive and structural factors that favour researchers' commercial engagement. Specifically, the main goal is to investigate how collaboration networks, in terms of breadth and depth, and research thematic trajectories affect the likelihood of engaging in entrepreneurial activity. Particular attention is given to the tension between thematic coherence (the exploitation of consolidated knowledge) and dynamic exploration (shifting towards new research domains).

Literature Review and Theoretical Framework

From a theoretical perspective, the framework lies at the intersection of organisational ambidexterity (Ambos et al., 2009; Chang et al., 2009; Nappo et al., 2024) and knowledge recombination theory (Fleming, 2001; Ou et al., 2025; Savino et al., 2017). In the context of academic technology transfer, ambidexterity does not merely refer to a cognitive dynamic attached to the evolution of research interests (Chang et al., 2009; Chang et al., 2016), but it also manifests as a structural process. Indeed, it represents the ability of the researcher to balance two main network dimensions: on one side, exploration is driven by the external breadth of the network, which favours access to heterogeneous and global stimuli; on the other

side, exploitation relies on the depth of the internal network positioning. In particular, the role of internal brokerage guarantees the organisational capabilities necessary to orchestrate local resources, integrate different types of knowledge, and transform them into commercial outputs.

Methodology and Methods

The empirical analysis is based on a sample of 610 researchers from the Life Sciences area at the University of Siena, observed over the 2013–2023 period. To analyse cognitive dynamics, we applied topic modelling to identify the dominant research topic of each publication. Subsequently, we developed a longitudinal 'topic drift' measure to capture the exploitative (thematic stability) or explorative (thematic shift) nature of the researchers' trajectories. To evaluate the structural dimensions, we constructed multiple network metrics (including internal degree, betweenness centrality, and external openness) by examining the number, frequency, and geographic scope of co-authorships. Finally, the dependent variables capturing commercial engagement were operationalised by measuring the researchers' ability to generate third-party research contracts, patents, and academic spin-offs.

Findings and Contribution

The results of the logit regressions used to analyse this framework highlight that research productivity and internal brokerage are the main drivers of technology transfer capability. From the cognitive perspective, the findings show that entrepreneurial activity does not require radical innovation, but rather a consolidated exploitation of the pre-existing research pathways. Furthermore, the results show that different cognitive backgrounds are associated to different entrepreneurial output.

Research Limitations

The main limitations are due to the empirical perimeter of the research that focuses on a single University and a specific discipline (Life Sciences). This limitation may affect the generalisability of these findings, while calling for future research.

Theoretical and Practical Applications and Implications

From a theoretical perspective, the paper emphasises that, despite the relevance of external network openness, the capability to orchestrate the internal innovation process through internal brokerage activity is crucial. From a policy perspective, the study offers several insights into how to direct research funding and design university structures capable of building a stable bridge between academic research and industrial application.

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MINIMIZING "NO SHOWS" OF OUTPATIENT CLINICS USING OVERBOOKING

Gad Vitner,
Faculty of Engineering Ruppin Academic Center

Keywords: Healthcare, No-Show, Outpatient Clinics, Overbooking

Abstract

The study was conducted in the medical clinics of a regional healthcare (HC) center in the northern part of the country. It serves a population of 200,000 in various clinics: Gastroenterology, Cardiology, Dermatology, Ophthalmology, Gynecology, Neurology, Orthopedics, Urology and Otorhinolaryngology. In addition, it operates a 24/7 Emergency Room (ER). Service in all the clinics are provided in two shifts, Sunday to Friday, 08:00-12:00 and 14:30-19:30. The center is approved to the ISO 9001:2015 standard.

A Pareto analysis reveals that Gastroenterology and Cardiology are the most often visited clinics. The average monthly arrivals to the cardiology clinic was 404 patients where in the Gastroenterology clinic there were 448 patients. Investigating these clinics' daily operation, observed that the issue of "No-Show" (N.S) is very critical, resulting in idle time of the medical staff. In Gastroenterology the average N.S. was 16.6% with a peak of 20% where in Cardiology the average N.S. was 22.6% with a peak of 34%.

Literature review recommends applying the Overbooking methodology to minimize the issue of N.S. and eliminating idle time of the medical staff. Parente et al. 2018, presented the usage of Overbooking strategy reducing the N.S. and improving patients' satisfaction. Pinedo & Zacharias, 2014, implement an optimal model based on N.S. probabilities, resulting in more effective operation. Zeng et al., 2013, implemented an Overbooking methodology based on personal characteristics of the patients. Ruiz-Hernández et al., 2020, introduce a linear programming model based on patients' behavior and history of N.S. Alaeddini et al. 2011, present an hybrid probabilistic model to forecast N.S. based on demographic and social characteristics related to the clinic type

and date of appointment. Cayirli et al. 2012, use a universal scheduling rule based on various service times, costs of medical staff and numbers of appointments per doctor.

A customer review was conducted to verify the expected waiting time by the patients. Review findings show that the average expected waiting time was 10.5 min.

A discrete event simulation model, using Python, was developed, implementing various combinations of overbooking. Two performance measures were defined: actual number of patients served and average waiting time. The model assumptions: service time with each patient 15 min., normal arrival distribution, exponential service time, only one patient is served by the doctor at any time, there are no breaks until the last patient is served and there is no abandonment of patients. A verification and validation using the statistical *t* test was conducted to prove the confidence level of the digital model. One thousand simulation runs were conducted testing five methods of Overbooking: 1. The present method as reference (no overbooking), 2. {(N.S.-walk ins) *x* staff capacity}, 3. Graded overbooking based on the difference (N.S.-walk ins), if the difference less than 10%, or between 10%-20% or greater than 20% multiply by 0.5, 0.75 and 1.0 accordingly, 4. Fixed overbooking, adding one patient to each service period, 5. Overbooking with no walk ins based on % N.S.

Simulation results show that in relation to the number of patients served in the Cardiology department the Graded Overbooking method yields a 15% improvement, where No Walk ins method with 11% improvement. Regarding the Gastroenterology department, the Overbook method resulted in 14% improvement, where, with Fixed overbooking, the improvement was only 11%.

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BRIDGING THE MIS IMPLEMENTATION GAP: CHANGE-ORIENTED LEADERSHIP AND TEAM REFLEXIVITY IN HEALTHCARE

Rashkovits, Sarit[1]; Erez, Miriam[2]

[1] Healthcare Systems Management, Yezreel Valley College, Yezreel Valley, Israel

[2] Faculty of Data and Decision Sciences, Technion – Israel Institute of Technology, Haifa, Israel

Keywords: management information systems, change-oriented leadership, team reflexivity, MIS implementation, healthcare management, performance feedback, team performance, digital transformation

Introduction

Organizations invest heavily in Management Information Systems (MIS) to enhance performance monitoring and improvement. Despite such investments, research demonstrates that providing performance feedback data alone often proves insufficient for performance improvement (Gabelica et al., 2014). This implementation gap—the disconnect between MIS provision and actual performance improvement—represents a critical challenge for healthcare organizations.

In healthcare settings, contemporary perspectives recognize that outcomes emerge from interdependent team processes rather than isolated individual actions. Yet the process through which teams translate performance feedback availability into performance improvement remains poorly understood. Drawing on goal-setting theory (Locke & Latham, 2019) and social information processing theory (Salancik & Pfeffer, 1978), we propose a first-stage moderated mediation model: MIS-enabled performance feedback availability enhances team performance through team reflexivity, but only when team leaders display change-initiating behavior.

Theoretical Framework and Hypotheses

Goal-setting theory suggests that in team settings, performance improvement requires adapting work strategies rather than merely increasing effort (Locke & Latham, 2019). Performance feedback may therefore improve performance only when teams use feedback information to reflect on and adapt their work strategies. Team reflexivity—the extent to which team members openly reflect on goals, strategies, and processes, and adapt them to current circumstances (West, 2000)—serves as this collective mechanism for strategy adjustment. Research demonstrates that team reflexivity enhances team performance across diverse settings (Le Blanc et al., 2024).

However, team reflexivity faces social-psychological barriers because it requires members to question existing practices and established routines (Morrison, 2011; Hackman, 2002). Team members rely on leader cues to determine whether reflexive behavior is appropriate and worthwhile.

Leaders who consistently demonstrate change-initiating behavior—persistently seeking improvement and challenging established routines—signal that reflection and adaptation are valued organizational behaviors (Salancik & Pfeffer, 1978). By signaling that questioning existing practices and adaptation are both valued and worthwhile, such leaders may reduce the social and psychological barriers associated with team reflexivity. Such leadership may be critical for enabling teams to engage reflexively with MIS data, thereby translating data access into performance improvement.

Method

We employed a quasi-experimental longitudinal design including all eligible primary healthcare clinic management teams within the largest district of a large healthcare organization. Fifty-six teams were measured at three time points over 18 months. At baseline, teams were naturally divided into high (n = 32) versus low (n = 24) feedback availability conditions based on organizational MIS implementation decisions, with no significant baseline differences in performance, clinic characteristics, or team leader characteristics. We implemented time-lagged measurements: team reflexivity and leadership were assessed at 14 months via surveys, and performance outcomes at 18 months via objective organizational records.

Team performance was measured using a composite diabetes care quality indicator based on HbA1c, LDL, and microalbumin testing rates. This composite provides a parsimonious and statistically stable measure of a central clinical domain on which teams received repeated MIS performance feedback. Team leader change-initiating behavior was rated by team members using an 8-item scale (Paglis & Green, 2002; $\alpha = .95$). Team reflexivity was assessed using a 5-item scale ($\alpha = .91$).

Analyses controlled for baseline team performance, allowing assessment of performance change over time.

Results

Moderated mediation analysis using Hayes's (2022) PROCESS macro supported both hypotheses. The interaction between feedback availability and leader change-initiating behavior significantly predicted team reflexivity ($B = 0.80$, $p < .05$, $R^2 = .15$). Simple slope analysis showed feedback availability positively related to reflexivity only when change-initiating behavior was high (+1SD: $B = 0.33$, $p < .01$), but not at average or low levels.

Team reflexivity significantly predicted subsequent team performance ($B = 0.02$, $p < .05$), contributing incremental variance beyond baseline performance ($\Delta R^2 = .05$, $p < .05$). In contrast, feedback availability alone did not significantly predict performance ($\Delta R^2 = .003$, ns), demonstrating data access without reflexive engagement proves insufficient for improvement.

The index of moderated mediation was significant ($B = 0.02$, 95% CI [0.002, 0.05]). The conditional indirect effect of feedback availability on performance via reflexivity was significant at high levels of team leader change-initiating behavior ($B = 0.02$, 95% CI [0.002, 0.05]), but not at average or low levels, confirming that feedback availability relates to performance only through team reflexivity under change-initiating leadership.

Originality and Value

This study explains the MIS implementation gap by identifying the leadership conditions under which performance feedback translates into team reflexivity and subsequent performance improvement. In doing so, it highlights that the value of MIS-enabled feedback depends not

only on data availability but also on team and leadership processes that enable teams to reflect on and adapt their work strategies.

Practical Implications

These findings identify change-oriented leadership as a critical factor in MIS implementation success. Organizations implementing performance management systems should recognize that technology provision represents an insufficient condition for performance improvement.

Healthcare organizations should integrate change-oriented leadership development into MIS implementation strategies. This integrated approach enables teams to engage reflexively with performance data, translating information access into sustained performance improvement.

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FROM INSIGHT TO INACTION: BUSINESS INTELLIGENCE IN THE AGE OF ARTIFICIAL INTELLIGENCE

Melillos, George[1]; Tsikkou, Emily[1]; Thanasoula, Panagiota[1]

[1]College of Business Studies Cyprus (CBS), Nicosia, Cyprus

Keywords: Business Intelligence, Artificial Intelligence, Decision-Making, Sensemaking, Managerial Judgement, Accountability, Insight-to-Action Gap, Information Overload.

Introduction

Organisations accumulate more information than ever yet often act on it slowly. Business Intelligence (BI) expands what managers can see but rarely guarantees timely action, and as artificial intelligence (AI) embeds in analytics, the gap between knowing and acting widens (Trieu, 2017). The constraint is seldom data or software; it is whether insight is interpreted, owned, and converted into a decision. This study names and frames that gap.

Purpose, Aim and Objectives

This study develops a conceptual framework explaining why BI and AI insight do not reliably translate into managerial action. Three research questions are addressed. RQ1: How does AI-augmented BI reshape the conversion of insight into action? RQ2: How does the diffusion of analytical authority affect accountability for decisions? RQ3: Under what conditions does insight abundance produce inaction rather than decisiveness? The aim is a simple, testable model of the insight-to-action gap.

Literature Review and Theoretical Framework

Research on BI value shows that analytical capability rarely converts automatically into organisational outcomes; value depends on use and on decision processes (Trieu, 2017; Sharma, Mithas and Kankanhalli, 2014). Three established theories explain this conversion. Sensemaking holds that information becomes actionable only when managers interpret ambiguous cues and enact them (Weick, 1995), influencing the mechanisms and processes of organising. Bounded rationality explains that, facing overload, decision-makers satisfice and defer to available cues rather than optimise (Simon, 1997). Accountability theory requires decision-makers to justify choices to relevant audiences (Bovens, 2007); when rationale migrates into automated outputs, ownership weakens. Integrated, the three operate in sequence: sensemaking determines whether insight acquires meaning, judgment determines whether

meaning is acted upon, and accountability determines whether action is owned. Prior BI work documents these symptoms but seldom integrates the mechanisms, which is the gap addressed here.

Methodology and Methods

A conceptual, theory-building design is adopted using integrative literature synthesis (Jaakkola, 2020). Sensemaking, bounded rationality, and accountability were selected for their direct relevance to insight use, then combined into a single model from which falsifiable propositions are derived. The design is analytical rather than empirical.

Main Findings and Contribution

The study proposes the Insight-to-Action Gap (IAG) framework (Figure 1). BI and AI continuously expand insight, but their conversion into action depends on three mediators. Greater insight volume widens the gap unless active sensemaking converts cues into shared meaning (P1). As analytical authority shifts from managers to AI outputs, accountability diffuses and follow-through weakens (P2). Under overload and bounded rationality, managers defer to system outputs, producing analysis paralysis rather than decisive action (P3). The mediators interact: weak sensemaking and diffused accountability jointly amplify paralysis.

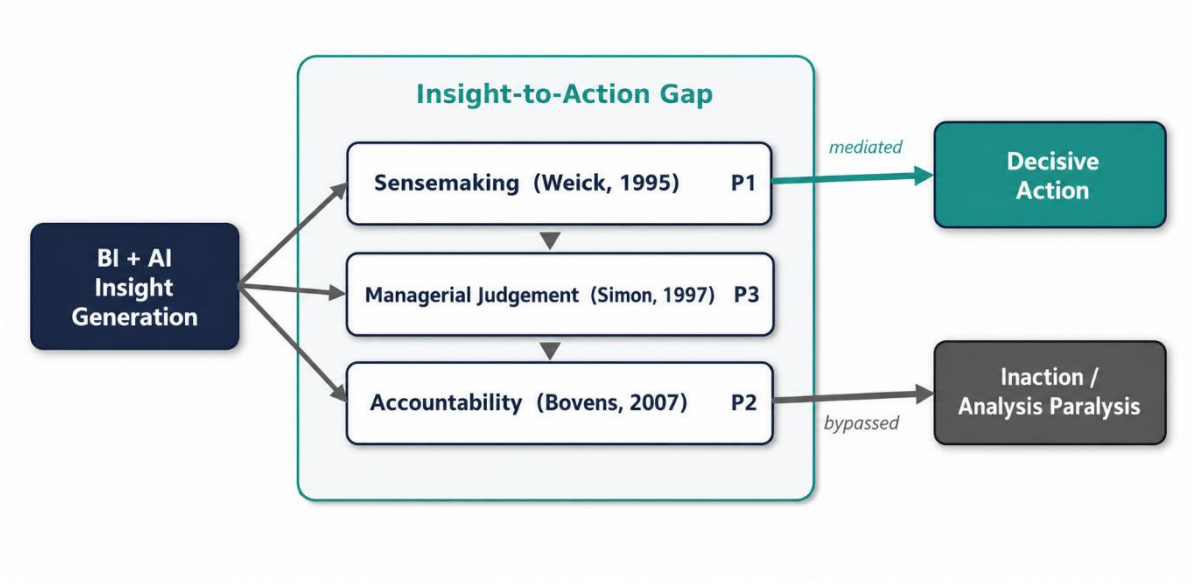


Figure 1: The Insight-to-Action Gap (IAG) framework

Originality and Value

The contribution recasts BI's persistent insight-without-action problem as a judgement-and-accountability phenomenon rather than a data or technology deficit, integrating sensemaking,

bounded rationality, and accountability into one testable model. It reframes AI in analytics as intensifying, not resolving, the managerial demand for judgement.

Research Limitations

The framework is conceptual and not empirically tested, and does not address sector, firm-size, or cultural variation.

Theoretical and Practical Implications

Theoretically, the IAG framework explains a recurring but under-theorised failure of analytics. Practically, organisations should pair AI outputs with explicit decision ownership, sensemaking routines, and override and explanation protocols, so that automation supports rather than replaces judgement. Future research should test the propositions through process studies and mixed-method designs of analytics-enabled decision-making (Sharma, Mithas and Kankanhalli, 2014).

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THE EMERGENCE OF AGENTIC AI: A PARADIGM SHIFT TO AUTONOMOUS ACTORS IN BUSINESS

De Queiroz, Hermano Jorge[1]

1School of Graduate Business and Technology, Lindsey Wilson University, Columbia, USA

Keywords: Agentic AI, autonomous agents, business process management, human-AI collaboration, business transformation, multi-agent systems, AI governance, ethical alignment

Introduction

The contemporary business environment is defined by a paradigm shift from task-specific AI assistants to fully autonomous actors driven by agentic AI—a transition with far-reaching implications for organizational knowledge processes, human-AI collaboration, and enterprise governance. Agentic AI is conceptually distinct from prior AI generations: it involves multi-agent collaboration, dynamic task decomposition, and orchestrated autonomy, enabling systems to pursue complex goals without continuous human direction (Sapkota et al., 2025; Raza et al., 2025). Despite growing technical literature, business scholarship has yet to produce an integrated account of what this transition means for knowledge management, governance architectures, and autonomous decision-making at scale.

Purpose, Aim and Objectives

This study synthesizes the rapidly evolving literature on agentic AI in business and critically examines the paradigm shift from reactive AI tools to proactive autonomous actors. Three objectives guide the study: (1) mapping the conceptual landscape distinguishing traditional AI agents from agentic AI systems; (2) analyzing technical and organizational enablers and barriers to autonomous business operations; and (3) identifying governance challenges surrounding ethical alignment, value governance, and interoperability.

Literature Review and Theoretical Framework

The literature reveals that agentic AI enables automation in which operators express high-level goals in natural language and systems autonomously execute multi-step workflows (Romero and Suyama, 2025). In business intelligence, agentic architectures create proactive decision-making loops beyond reactive dashboards (Saidkhujaev, 2025). Composable agent frameworks enable specialized task orchestration across multi-cloud environments (Karanam, 2025).

Critical gaps persist: most technical contributions treat autonomy as an engineering problem, overlooking organizational knowledge consequences. Interoperability standards remain underdeveloped (Sharma et al., 2025), and ethical risk frameworks lag behind deployment realities (Gabriel et al., 2024; Zeng et al., 2025).

Methodology and Methods

A systematic literature review methodology is employed, analyzing peer-reviewed publications from 2024–2026 across Scopus, Web of Science, and IEEE Xplore, with thematic synthesis organizing findings into three clusters: capability and architecture, organizational transformation, and governance and risk.

Main Findings and Contribution

Preliminary findings indicate that agentic AI is driving fully autonomous business models that transform enterprise operations, knowledge workflows, and human agency in organizational decision-making. The study contributes: (1) a conceptual map distinguishing traditional from agentic AI across organizational dimensions; (2) an integrated synthesis of enablers and barriers spanning technical, managerial, and ethical perspectives; and (3) three governance recommendations—redesigning frameworks for delegated decision authority, adapting knowledge systems to audit agent-generated artefacts, and embedding human oversight as a first-class design requirement.

Originality and Value

This study offers an early cross-disciplinary synthesis bridging technical, managerial, and ethical perspectives typically examined in isolation, providing timely insights for researchers and practitioners navigating the organizational implications of autonomous AI.

Research Limitations

The study is bounded by indexed publication coverage through mid-2026 and reflects the pace of a rapidly evolving field. Industry-specific variations in agentic AI adoption may limit the generalizability of conceptual conclusions across all organizational contexts.

Theoretical and Practical Applications and Implications

The governance recommendations offer actionable guidance for enterprise architects, knowledge management practitioners, and policy makers. Theoretically, the study extends organizational AI adoption frameworks by situating agentic autonomy within knowledge

governance discourse, opening research avenues at the intersection of AI ethics, business process management, and institutional knowledge theory.

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MATHEMATICAL SAFETY CERTIFICATION FRAMEWORKS FOR AUTONOMOUS SYSTEMS: STRATEGIC IMPLICATIONS FOR DEFENSE AND CRITICAL INFRASTRUCTURE INDUSTRIES

Elghandour, Feras[1]; Balomenou, Chrysanthi[2]; Huqi, Melisa[3]

[1]El Ghandour Research Labs, Ontario, Canada

[2]Faculty of Economics and Administrative Sciences, Epoka University, Tirana, Albania

[3]El Ghandour Research Labs, Ontario, Canada

Keywords: Mathematical Safety Certification, Autonomous Systems, Defense Technology, Functional Safety, Critical Infrastructure, Error Elimination Architecture

Abstract

The deployment of autonomous systems in mission-critical environments, including defence, aerospace, and critical infrastructure, demands safety assurance methods that exceed the capabilities of conventional testing-based approaches. While standards such as ISO 26262, DO-178C, and IEC 61508 have established rigorous frameworks for functional safety in their respective domains, they remain fundamentally reliant on probabilistic confidence derived from finite test cases rather than mathematical certainty. This paper presents a novel theoretical framework for Mathematical Safety Certification (MSC) of autonomous systems, grounded in formal verification methods and multi-dimensional error elimination. The proposed framework introduces a 6-Dimensional Error Elimination Architecture that systematically addresses error sources across spatial, temporal, coherence, and cross-domain transfer dimensions, achieving provable safety guarantees through machine-verified formal proofs. The methodology leverages interactive theorem proving using Lean 4 and the Mathlib mathematical library to construct zero-axiom, zero-sorry formal proofs that provide mathematical certainty rather than statistical confidence. Strategic applications are examined in North American aerospace defense modernization, Arctic sovereignty operations, and autonomous surveillance systems. The paper analyses the competitive implications of provable safety certification for the defense industrial base, with particular attention to emerging government programmes designed to strengthen sovereign defense capabilities. Findings suggest that mathematical safety certification offers significant advantages for nations seeking technological sovereignty in autonomous systems.

Introduction

Autonomous systems' proliferation across defense, aerospace, transportation, and critical infrastructure creates an urgent challenge: deploying self-directed systems where failure is catastrophic. This challenge intensifies as nations invest in autonomous capabilities for military operations, border surveillance, and infrastructure management (Luckcuck et al., 2019; Seshia et al. 2022). Traditional safety approaches rely on exhaustive testing, simulation, and statistical confidence. Standards such as ISO 26262 (automotive), DO-178C (airborne), and IEC 61508 (industrial) establish rigorous but probabilistic frameworks (International Organization for Standardization, 2018; RTCA, 2011; International Electrotechnical Commission, 2010). These standards mandate test coverage, hazard analysis, and risk assessment, yet cannot provide mathematical certainty across all scenarios. Amodei et al. (2016) observed that modern AI complexity introduces failure modes that conventional testing cannot exhaustively enumerate. Testing-based assurance is inadequate in mission-critical environments. Defense applications, including continental aerospace defense modernization, Arctic operations, and autonomous surveillance, require safety guarantees that withstand adversarial conditions and combinatorial complexity. Dalrymple et al. (2024) at UC Berkeley argued that approaches based only on experimental tests cannot produce safety guarantees for advanced AI systems, and that formal mathematical approaches are essential. This paper addresses this gap by presenting a theoretical framework for Mathematical Safety Certification (MSC) of autonomous systems. The framework introduces a multi-dimensional error elimination architecture providing provable safety guarantees through machine-verified formal proofs. The research contributes to verified-AI literature (Seshia, et al. 2016) by applying interactive theorem proving to autonomous systems certification. Contemporary developments in 2025-2026 have transformed the landscape of formal verification and AI safety, lending urgency to the present research. The AlphaProof system developed by Trinh et al. (2025), published in Nature, showed that Lean 4-based formal theorem proving can solve problems at the level of the International Mathematical Olympiad, establishing the practical scalability of interactive theorem proving for complex reasoning tasks. NIST has published a Goedelian impossibility proof (Vassilev et al., 2026) showing that finite testing-based AI safety approaches cannot provide complete adversarial-input guarantees, fundamentally challenging current certification paradigms. The International AI Safety Report 2026 (Bengio et al., 2026), authored by 96 experts, identifies the evaluation gap, the discrepancy between AI capabilities and

safety verification, as AI safety's most pressing technical challenge. These contemporary developments show that formal mathematical methods are not optional enhancements but necessary foundations for safe deployment of autonomous systems. The remainder of this paper is organized as follows. The next section reviews current literature on AI safety, formal verification methods, and certification standards. The theoretical framework section introduces the 6-Dimensional Error Elimination Architecture. The methodology section describes the formal verification approach used to validate the framework. Applications in defense and critical infrastructure are then examined, followed by a discussion of strategic implications for industry. The paper concludes with a synthesis of findings and directions for future research.

Literature Review

AI safety has evolved rapidly from philosophical concerns to concrete engineering challenges. Amodei et al. (2016) identified five practical research problems related to accident risk in machine learning systems: avoiding side effects, avoiding reward hacking, scalable supervision, safe exploration, and managing distributional shift. These problems underscore a tension: as autonomous systems advance, failure modes become harder to anticipate through testing alone. Seshia et al. (2022) defined 'verified AI' as designing AI systems with provable assurances of correctness against mathematically specified requirements. They identified five key challenges: environment modelling, formal specification, learning-system representation, scalable verification, and design for correctness. Casimiro et al. (2023) advanced this discourse by arguing certification must be iterative and integrate formal methods with regulatory frameworks for heterogeneous deployment contexts. Formal methods, mathematically based techniques for specification and verification, are the most promising approach to rigorous safety guarantees. Luckcuck et al. (2019) surveyed formal specification and verification for autonomous robotics, identifying challenges posed by their hybrid, safety-critical nature. Their analysis revealed that while model checking, theorem proving, and runtime verification offer complementary strengths, scaling gaps remain for complex real-world systems. Recent work by Farrell et al. (2026) further articulates the engineering challenges and opportunities for reliable autonomous systems.

Formal verification methods

Formal verification provides mathematical proofs of system correctness. Model checking automatically explores all possible system states to verify properties such as safety, liveness, and

reachability (Baier and Katoen, 2008; Chen et al., 2026). Theorem proving uses logical deduction, offering greater expressiveness but requiring more human guidance (Harrison, 2009). Runtime verification monitors execution to detect formal-specification violations (Leucker and Schallhart, 2009). Probabilistic model checking extends these methods to systems with stochastic behaviour (Kwiatkowska, Norman and Parker, 2022). Interactive theorem provers (ITPs) have achieved remarkable advances recently. Systems such as Coq (Bertot and Castéran, 2004), Isabelle/HOL (Nipkow, Paulson and Wenzel, 2002), and Lean 4 (de Moura and Ullrich, 2021) enable machine-verified proofs with absolute certainty. Lean 4 has gained traction as both a programming language and proof assistant, enabling specifications, correctness proofs, and deployable code in one system (Carneiro, 2024). The Mathlib library for Lean 4, containing nearly two million lines of formal mathematics, has become one of the most extensive mathematical libraries available in any proof assistant, enabling verification projects that would otherwise be impractical. Barrier certificates are a powerful tool for safety verification of dynamical systems. Prajna and Jadbabaie (2004) introduced barrier-function methods providing exact safety certificates without computing reachable sets. Subsequent work by Prajna et al. (2004) extended these methods to stochastic systems, establishing upper bounds on the probability that system trajectories reach unsafe regions. Recent work by Barhoumi et al. (2026) extends barrier-certificate methods to connected and autonomous vehicles. These tools provide a foundation for provable safety in continuous and hybrid autonomous systems.

Certification standards and their limitations

Current functional safety certification relies on a hierarchy of testing-based standards. ISO 26262, titled 'Road vehicles - Functional safety,' provides an automotive-specific risk-based approach with Automotive Safety Integrity Levels (ASILs) ranging from A (lowest) to D (highest hazard level). The standard mandates hazard analysis, safety-requirements specification, and verification through testing, but not formal mathematical proof (International Organization for Standardization, 2018). DO-178C, the primary airborne-software certification standard, establishes Design Assurance Levels (DALs) A-E. While its supplement DO-333 introduces formal methods as an alternative means of compliance, formal verification remains optional rather than mandatory (RTCA, 2011). IEC 61508 provides a generic functional-safety framework with four Safety Integrity Levels (SILs); SIL 4 demands a risk reduction factor of 10,000-100,000. Despite its rigour, IEC 61508 relies on structured verification rather than mathematical proof

(International Electrotechnical Commission, 2010). A critical gap concerns autonomous systems employing machine learning. Lee et al. (2026) note that current frameworks, designed for deterministic software, struggle with the adaptive nature of AI-enabled autonomous systems. Certifying military AI for aviation has prompted calls for new frameworks integrating formal methods with domain-specific requirements (Rodriguez-Fernandez et al., 2024). Industry-driven shift-left verification practices (FM 2026, 2026) demonstrate the integration of large language models with formal methods for automotive requirements.

Theoretical framework

(i) Mathematical Safety Certification: Conceptual Foundations

The MSC framework rests on the principle that safety-critical autonomous systems require deterministic rather than probabilistic assurance. Unlike testing-based approaches that sample from an infinite space of behaviours, MSC constructs mathematical proofs holding universally across all operational scenarios within a formally specified domain. The theoretical foundation draws on three converging developments: (1) advances in interactive theorem proving that enable machine verification of complex mathematical proofs; (2) the formalization of safety properties as mathematical propositions amenable to deductive proof; and (3) the recognition that multi-dimensional error sources in autonomous systems require a systematic, architecturally grounded approach to elimination rather than mitigation (Seshia et al., 2022; Dalrymple et al., 2024).

(ii) The 6-Dimensional Error Elimination Architecture

This Architecture addresses the complete error-source space in autonomous operation. Rather than treating errors as isolated incidents to be detected and corrected, the architecture models the error space as a multi-dimensional manifold and constructs formal proofs of error elimination across each dimension. The six dimensions encompass: (1) three spatial dimensions (x, y, z) capturing errors from the physical environment, including sensor uncertainties, localization errors, and modelling inaccuracies; (2) a temporal dimension addressing timing, sequencing, and real-time responsiveness, ensuring safety properties hold continuously; (3) a coherence dimension based on recursive decomposition, ensuring logical consistency across components through hierarchical verification; and (4) a cross-domain transfer dimension validating safety properties when behaviours or learned models transfer between domains. The architecture defines a composite function C_6D(x,t) aggregating weighted certification measures across 6 dimensions. Certification

is achieved when this composite function exceeds a formally derived threshold. The threshold derives from mathematical properties ensuring the closed topology of the error elimination space, so no error pathway escapes formal verification coverage. This approach differs from existing standards in three ways. First, completeness: spanning the full error-space dimensionality ensures no error category is systematically overlooked. Second, composability: dimensional proofs compose into system-level guarantees via the coherence dimension. Third, transferability: the cross-domain dimension extends certified safety properties to new operational contexts.

Methodology

Research design

This research uses design science methodology (Hevner et al., 2004; Pries-Heje, Baskerville and Venable, 2026) to develop and validate the MSC framework. DSR suits creating novel artefacts, here a formal verification framework, and evaluating their utility. The research proceeded through three phases: (1) problem identification via certification-gap analysis; (2) architecture design and development; (3) demonstration through formal proofs and case analysis.

Dimension	Error Domain	Verification Method
Spatial (x, y, z)	Sensor, localisation, environmental modelling	Formal bounds on measurement uncertainty
Temporal	Timing, sequencing, real-time response	Temporal logic proofs of continuous safety
Coherence	Component interaction, system integration	Recursive decomposition and hierarchical proof
Cross-domain transfer	Domain shift, operational context change	Transfer validity proofs with domain invariants

Table 1: Dimensions of the Error Elimination Architecture and associated verification methods

Design Science Research (illustrated in Figure 1), follows Hevner et al. (2004) and Peffers et al. (2007), providing the key methodological foundation of the study. DSR suits constructing and evaluating novel artefacts addressing identified gaps. MSC qualifies as a method-based artefact comprising the 6-Dimensional Architecture and the proof-construction protocol. Leveson's (2011) systems-theoretic model establishes safety as an emergent property of system interactions, informing the framework's design. This combination yields a robust pathway from problem identification through artefact construction to evaluation.

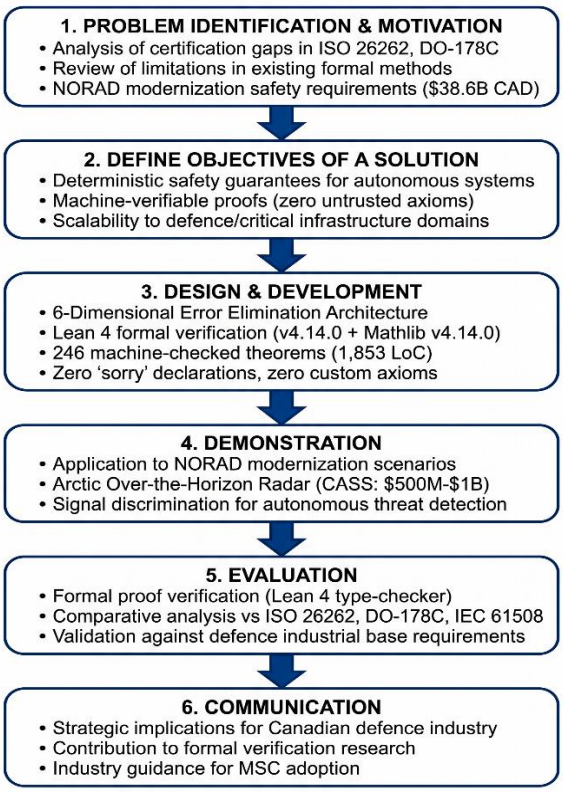


Figure 1: Design Science Research Process (Adapted from Peffers et al. 2007)

Formal proof construction

The framework was validated in Lean 4 (v4.14.0), an interactive theorem prover (de Moura and Ullrich, 2021). Lean 4 unifies programming and proof assistant capabilities, enabling propositions and proofs in one system. All proofs were verified against Mathlib 4.14.0, the community-maintained library providing foundational mathematical structures (Mathlib Community, 2020). The verification covers 246 theorems across 1,853 lines of Lean code. All proofs meet two criteria: zero sorry declarations and zero custom axioms (all derive from standard Lean 4 and Mathlib). This is the highest formal verification standard currently achievable: every theorem is machine-checked, the chain independently reproducible. Proof development followed a layered approach. Foundation proofs established the architecture's basic properties, including the composite function's well-definedness and the error space's topological closure. Integration proofs demonstrated composability of dimensional certification across system boundaries. Application-level proofs verified specific safety properties relevant to autonomous system operation, including bounded-time response guarantees, spatial error containment, and coherence preservation under system evolution.

Validation approach

Beyond formal proofs, validation included comparison against ISO 26262, DO-178C, IEC 61508, and conceptual application to defense and critical infrastructure scenarios. This multi-method approach follows DSR practices (Peffers et al., 2007; Pries-Heje, Baskerville and Venable, 2026), grounding theoretical contributions in practical applicability. Hierarchical safety analysis approaches (Chen et al., 2025) inform the cross-dimensional structure of the framework.

Applications in Defense and Critical Infrastructure

Continental aerospace defense modernization

North American aerospace defense is undergoing major modernization. Canada has committed CAD $38.6 billion over twenty years to modernize the North American Aerospace Defense Command (NORAD), encompassing new surveillance systems, enhanced decision-making capabilities, modernized air weapons, and upgraded Northern infrastructure (Government of Canada, 2023, 2026). Investments include Arctic Over-the-Horizon Radar (initial capability 2028), Polar Over-the-Horizon Radar (2032), and autonomous R&D through 2028 (Government of Canada, 2023). NORAD modernization includes semi-autonomous systems across domains, human-machine teaming research, counter-UAS, and advanced sensor technologies (Government of Canada, 2023). These systems operate where software failure could compromise continental defense context where statistical assurance is insufficient. The MSC framework provides mathematically provable safety guarantees, ensuring autonomous components function correctly under all specified conditions rather than merely tested ones.

Arctic operations and autonomous surveillance

The Arctic presents unique challenges for autonomous system deployment. Extreme temperatures, limited communications infrastructure, prolonged periods of darkness, and changing ice conditions create an operational environment that pushes autonomous systems beyond the boundaries of conventional testing regimes. Research into unmanned aerial vehicles (UAVs) for Arctic surveillance has highlighted the potential of autonomous platforms to address persistent surveillance gaps across Canada's northern regions (Canada Foundation for Innovation, 2025; Centre for European Policy Analysis, 2026). The Canadian Arctic Suite of Sensors programme ($500 million-$1 billion) will deploy autonomous sensors across Arctic waters (Government of Canada, 2018). In these environments, the MSC framework offers particular value. The spatial

dimensions of the error elimination architecture formally bound the effects of sensor degradation under extreme conditions. The temporal dimension ensures real-time safety holds despite increased communication latencies. The cross-domain dimension validates that, certifications achieved under controlled testing extend formally to Arctic conditions-a capability testing-based approaches cannot provide.

Signal discrimination and autonomous decision support

Modern defense systems increasingly require autonomous signal discrimination capabilities for radar processing, drone detection, and threat classification. King's College London policy analysis (Cummings et al., 2021) holds that future semi-autonomous combat systems must 'sense and understand threats with greater fidelity and respond more rapidly in the information age'. MSC provides formal guarantees on decision-support algorithm correctness, ensuring signal classification and threat assessment meet provable thresholds rather than statistical benchmarks.

Strategic Implications for Industry

Impact on the defense industrial base

MSC represents a potential paradigm shift for the defense industrial base. Provable safety guarantees create competitive advantage for firms mastering formal verification. This advantage matters in procurement contexts requiring the highest safety integrity levels. The recent launch of the Defense Industrial Strategy in Canada, which positions Canadian industry to access $180 billion in defense procurement opportunities and $290 billion in defense-related capital investment over the next decade, underscores the scale of this opportunity (Prime Minister of Canada, 2026). The Canadian Defense Industry Resilience programme funds production capacity for defense goods and services, supporting commercialization of defense IP (Government of Canada, 2026). Firms delivering mathematically certified autonomous systems can capture a large share, as MSC addresses CDIR's sovereign capability requirements.

Market opportunities and competitive dynamics

The global market for autonomous defense and critical-infrastructure systems is expanding, driven by strategic competition and modernization imperatives. Several factors favor MSC adoption. First, regulators increasingly recognize testing-based certification's limitations for AI systems, creating demand for formal-methods alternatives (Rodriguez-Fernandez et al., 2024). Second, high-profile autonomous-system failures heighten awareness of the gap between statistical

confidence and actual safety. Third, advances in interactive theorem proving, particularly Lean 4's maturation, have made formal verification practically accessible. SMEs with formal verification capabilities are positioned as critical enablers in defense supply chains. The Defense Industrial Strategy's $379.2 million Regional Defense Investment Initiative creates a pathway for MSC-capable firms to scale (Prime Minister of Canada, 2026). The framework's composability-letting certified subsystems integrate into larger certified systems-aligns with supply-chain dynamics, enabling component-level certification to contribute to system-level assurance.

Implications for technological sovereignty

The strategic importance of mathematical safety certification extends beyond individual firm competitiveness to national technological sovereignty. Nations developing indigenous formal verification capabilities reduce dependence on foreign suppliers for safety-critical defense technology (RAND Corporation, 2026). The CDIR programme's sovereign-capability focus and the Defense Industrial Strategy's 70% Canadian-acquisition target reflect this sovereignty imperative (Government of Canada, 2026; Prime Minister of Canada, 2026). Furthermore, expertise in mathematical safety certification has dual-use applications spanning civilian autonomous vehicles, medical robotics, nuclear safety systems, and critical infrastructure protection. Nations that invest early in building this capability create export opportunities and alliance-strengthening technology transfer pathways. The proposed framework's foundation in open-source tools (Lean 4 and Mathlib) ensures that sovereign capability development is not constrained by proprietary dependencies, while the specific application methodologies and proof libraries represent protectable intellectual property.

Conclusion and Discussion

This paper presented a theoretical framework for Mathematical Safety Certification of autonomous systems, introducing a 6-Dimensional Error Elimination Architecture that provides provable safety guarantees through machine-verified formal proofs. The framework addresses a critical gap in the current certification landscape: the inability of testing-based standards to provide mathematical certainty about the safety of autonomous systems operating in mission-critical environments. The strategic implications of this capability are significant. As nations invest heavily in autonomous defense systems, exemplified by Canada's $38.6 billion NORAD modernization programme and its new Defense Industrial Strategy, the demand for provable safety certification will intensify.

Firms and nations that develop indigenous capabilities in mathematical safety certification will enjoy competitive advantages in defense procurement, contribute to technological sovereignty, and establish intellectual property positions that span defense and civilian applications. The framework's foundation in interactive theorem proving (demonstrated through 246 machine-verified theorems with zero unproven assertions and zero custom axioms) represents the highest achievable standard of safety assurance with current technology. As the field of formal verification continues to advance, and as regulatory frameworks evolve to accommodate AI-enabled autonomous systems, mathematical safety certification (Lindemann et al., 2024) is positioned to become an essential component of the safety engineering toolkit for defense and critical infrastructure industries. Future research should focus on extending the framework to incorporate emerging neural network verification techniques, conducting empirical validation in operational defense environments, and developing standardized interfaces between mathematical safety certification and existing regulatory frameworks. The transition from probabilistic to deterministic safety assurance represents not merely a technical advancement but a paradigm shift in how society establishes trust in autonomous systems entrusted with protecting human life and national security.

Provable safety versus testing-based approaches

The fundamental advantage of mathematical safety certification lies in the nature of its guarantees. Testing-based approaches, however comprehensive, can only demonstrate the absence of failure in observed scenarios. As Dijkstra (1972) observed, testing can reveal the presence of bugs but never their absence. Formal verification, by contrast, constructs proofs that hold universally which is a property that is uniquely valuable in safety-critical contexts where the cost of undiscovered failure is catastrophic. Dalrymple et al. (2024) argued that for AI systems above certain risk or capability thresholds, the burden of demonstrating safety guarantees should fall on developers, and that experimental tests alone are insufficient for producing such guarantees. This perspective aligns with the MSC framework's position that mission-critical autonomous systems require a fundamentally different approach to certification-one that provides quantifiable guarantees through formal proof rather than statistical inference. However, it is important to acknowledge the complementary relationship between formal verification and testing. Formal proofs verify that a system's implementation correctly satisfies its specification, but the adequacy of the specification itself must be validated through domain expertise and operational experience. The MSC framework addresses this through its coherence dimension, which ensures that specifications at

different levels of abstraction are mutually consistent, and through the temporal dimension, which bridges the gap between static proofs and dynamic operational behavior.

Scalability and practical considerations

A recognized challenge in formal verification is scalability. The state space explosion problem, where the number of states grows exponentially with system complexity, has historically limited the practical application of formal methods (Clarke et al. 2018). The proposed framework addresses this through three mechanisms. First, the recursive decomposition inherent in the coherence dimension enables hierarchical verification, where system-level properties are derived from compositionally verified sub-system properties. Second, the use of theorem proving rather than model checking avoids explicit state enumeration, enabling verification of systems with infinite or continuous state spaces. Third, the Lean 4 proof assistant's integration of programming and proving enables the construction of proof automation tactics that reduce the manual effort required for large-scale verification campaigns. The practical cost of formal verification remains higher than conventional testing for most applications. However, in safety-critical defense and infrastructure contexts, the cost of certification is a small fraction of total system cost, and the cost of failure is orders of magnitude higher. The economic case for MSC strengthens as autonomous systems assume greater operational responsibility and as regulatory frameworks evolve to require stronger safety assurance.

Limitations and future research

This research has several limitations that suggest directions for future work. First, the formal verification of machine learning components (particularly deep neural networks) remains an active area of research with significant open challenges (Liu et al., 2021). The current framework addresses this through the cross-domain transfer dimension, but further work is needed to integrate emerging techniques for neural network verification into the MSC architecture. Second, the framework has been validated primarily through formal proof construction and conceptual case analysis; empirical validation through deployment in operational defense environments would strengthen the evidence base. Third, the relationship between mathematical safety certification and evolving regulatory frameworks requires further investigation, particularly as standards bodies develop new guidance for AI-enabled systems.

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WHY PREDICTIVE MAINTENANCE IS A STRATEGIC MANAGEMENT PROBLEM: A REVIEW AND IDENTIFICATION OF KEY PERFORMANCE INDICATORS (KPIS)

Remondino, Marco[1]; Choobdarian, Rezan[2]

[1] Department of Economics, University of Genoa, Genoa, Italy

[2] Department of Economics, University of Genoa, Genoa, Italy and Arkytec 360 SPM

Keywords: Predictive Maintenance, Strategic Management, Key Performance Indicators, Critical Infrastructure.

Abstract

Infrastructure maintenance is evolving from reactive, manual approaches toward predictive and autonomous systems. Central to this shift is predictive maintenance (PdM), which uses data from structural health monitoring (SHM), digital twins, and analytics to anticipate failures and optimize interventions. This paper argues that PdM should be viewed not only as a technical tool but as a strategic management challenge, one that reshapes long-term value creation, risk governance, and multi-dimensional stakeholder outcomes.

This study presents a scoping review that examines literature from 2020 to 2026 across the built environment, asset management, and operations and information systems fields, complemented by international standards and policy reports. Two research questions frame the analysis: first, how does the literature substantiate the strategic relevance of PdM for firms in construction, maintenance, and technology, as well as for public owners in terms of portfolio governance and public value; and second, what constitutes a minimal set of cross-asset, non-technical operational KPIs capable of supporting the managerial monitoring of PdM programs.

Findings indicate that PdM aligns with contemporary strategic management constructs, notably creating shared value and public value, and with asset management principles that balance performance, cost, and risk over the life-cycle. The paper then derives a concise set of 10–12 KPIs designed to complement technical indicators, emphasizing service continuity, safety-oriented risk exposure, decision and intervention timeliness, budget predictability, environmental intensity, and auditability. Future research directions are articulated through an ongoing industry collaboration aimed at operationalizing the KPI logic in an AI-driven, human-centric decision support system.

Introduction and Research Questions

Critical infrastructure systems provide essential services to society while being exposed to both gradual deterioration and sudden, high-impact hazards. The failure of such structures can result in severe societal disruption and pose significant threats to human life, underscoring the importance of their preservation and life-cycle extension. In response to this challenge, SHM has emerged as a key strategy, focused on the systematic detection of damage in engineering infrastructure to identify changes in structural condition before they escalate into critical failures (Farrar and Worden 2012). SHM enables continuous monitoring and assessment of operating conditions, thereby supporting more effective maintenance practices, improved asset management, and better-informed decision-making (Zhang et al. 2025).

In contrast to reactive maintenance, which occurs after a failure and leads to unplanned downtime and high repair costs, and to preventive maintenance, which follows fixed schedules that may not reflect the actual condition of an asset, often resulting in inefficiencies, AI-based predictive maintenance uses sensor data and machine learning to detect faults in real time. This enables timely interventions that extend equipment life, reduce downtime, optimize resources, and enhance infrastructure safety and reliability (Lokhande et al. 2025). PdM advances beyond traditional condition-based approaches by introducing prognostic, forward-looking planning. PdM creates value only when predictive insights translate into concrete decisions and governance actions, such as prioritizing interventions under budget constraints, allocating life-cycle capital, establishing accountability, and setting performance goals that balance safety, continuity, and sustainability (GFMAM 2016).

This reframing addresses the urgent need to enhance the resilience of mobility and essential services amid aging infrastructure, climate stress, and budget constraints. Failures of critical assets can cause significant disruptions with serious social sustainability effects. Digital transformation is crucial for mitigating these risks and ensuring transparent and equitable infrastructure governance. Moreover, PdM is positioned as a systemic organizational capability that necessitates alignment among business strategy, IT, data governance, and workforce development (Benhanifia et al. 2025). In response to this imperative, this paper contributes to the literature by reframing predictive maintenance in infrastructure as a strategic management capability rather than a purely technical function.

The argument is presented through three key perspectives: first, shared value focuses on generating economic value while addressing societal challenges (Porter and Kramer 2019);

second, public value theory emphasizes the design of management systems for citizen value and external accountability (Moore 1995); third, asset management recognizes value realization as a balance of performance, cost, and risk throughout the asset life-cycle (ISO 2024). Accordingly, this paper addresses two research questions. The first (RQ1) investigates how recent literature supports the strategic relevance of PdM for infrastructure, examining its implications for private firms and public asset owners across economic, social, and environmental dimensions. The second (RQ2) asks what constitutes a minimal set of cross-asset, non-technical operational KPIs that can effectively guide managerial oversight of PdM initiatives, complementing rather than replacing engineering metrics. This paper reviews literature from 2020 to 2026 to address its research questions. It takes a non-normative approach, using international standards and policy documents as contextual evidence of institutional trends toward life-cycle, risk-informed, and value-oriented asset management, rather than treating them as legal requirements or compliance tools (G20 2021).

Scoping Review Method

This paper draws on the systematic ten-step process proposed by Marzi et al. (2025) as a guide to ensure structural clarity. The steps range from defining the research question and search strategy to data screening, bibliometric analysis, cluster identification, and finally developing a theoretical contribution. This framework supports transparency, reproducibility, and methodological rigor. To answer the two research questions, the findings are organized as follows. For RQ1, three themes are addressed: strategic value, public value implications, and alignment with sustainability pillars. For RQ2, recurrent decision points from the literature are translated into measurable constructs. Candidate indicators are then filtered by feasibility, interpretability, and cross-asset applicability, resulting in a minimal set of KPIs.

A scoping review approach was selected because infrastructure PdM spans multiple research communities, including infrastructure monitoring, computer science, asset management, and project governance. The scoping design aims to map dominant themes and representative contributions in an interdisciplinary field, where strict systematic aggregation can be impractical due to heterogeneity of research designs and terminology (Nunes et al. 2023). While the core technologies of PdM have been under development for over a decade, their integration into strategic management frameworks has been primarily addressed in the last few years. Therefore, the literature search focuses on publications from 2020 to 2026, especially the recent five years, while also incorporating foundational works.

Key management concepts like shared value creation, public value theory, and references on risk and asset management are emphasized. Sources primarily include peer-reviewed articles from engineering and built environment fields, alongside international standards and policy documents relevant to life-cycle management. The search focused on queries in Google Scholar, Scopus, ScienceDirect, and Springer databases. The search strategy combined three thematic clusters. The first focused on PdM and prognostics, using terms such as "predictive maintenance," "condition monitoring," "prognostics," and "remaining useful life." The second addressed SHM, including "structural health monitoring," "bridge," "tunnel," "dam," and "critical infrastructure." The third targeted managerial and governance aspects, incorporating "asset management," "life cycle," "risk management," "public value," "shared value," "project management," "benefits realization," "smart contracts," and "blockchain."

Initial searches helped identify dominant review articles and highly cited foundational works. Subsequent searches were refined to focus more specifically on infrastructure-related decision-making and governance contributions, such as data quality in SHM decision processes, life-cycle sustainability, and performance-based contracting enabled by smart contracts (Makhoul 2024). Non-academic and non-peer-reviewed articles, as well as articles written in languages other than English, were excluded (Marchesani et al. 2023).

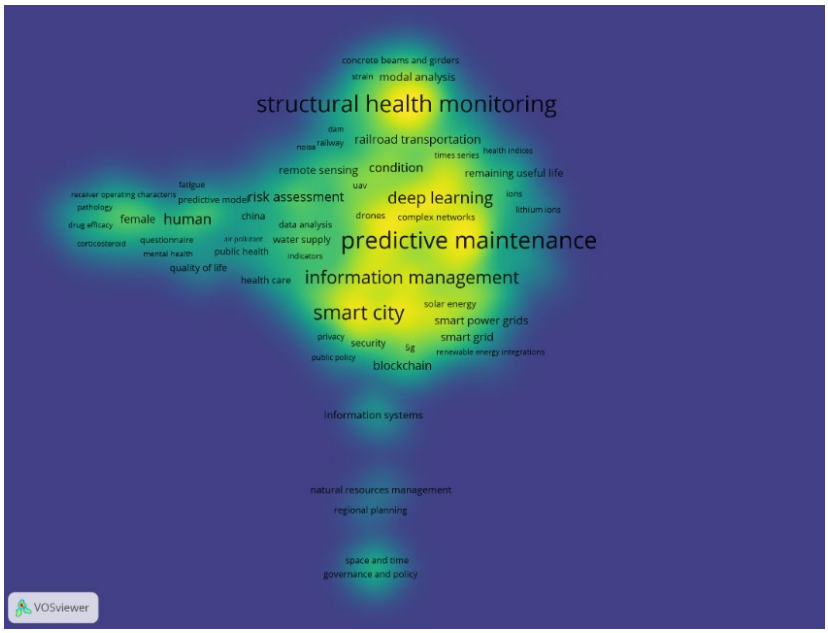


Figure 1. Keyword co-occurrence map generated with VOSviewer

Figure 1 displays an initial keyword co-occurrence analysis performed with VOSviewer software, which examines how keywords are related based on the frequency with which they appear together across a collection of scientific documents derived from database queries. The VOSviewer map demonstrates that the academic literature on PdM in infrastructure

systems is a multi-layered field. It is built on a foundation of structural health monitoring technologies, which feed into advanced analytical models. These capabilities are applied within the context of smart urban systems and are increasingly framed by discussions of governance, risk, and societal value. The map visually suggests that PdM is indeed a strategic management problem, situated at the nexus of engineering, data science, and public policy. Inclusion criteria prioritized peer-reviewed reviews and empirical studies that explicitly connect monitoring and prediction to decision-making, life-cycle management, risk or resilience, and sustainability. Research on digital twins and blockchain-enabled approaches was also included when explicitly linked to maintenance governance, particularly in areas such as performance-based contracting, auditability, and data provenance. Conversely, papers were excluded if they focused solely on algorithmic model performance without addressing maintenance decision processes or their organizational implications (Van Dinter et al. 2022). Candidate indicators were filtered by feasibility, interpretability, and cross-asset applicability to yield a minimal KPI set. This study is subject to certain limitations inherent to its scoping review design. It does not aim to cover all publications on predictive maintenance, but seeks conceptual completeness by capturing the key mechanisms, decision processes, and governance challenges that repeatedly appear across monitoring and management literature.

Literature Synthesis on Strategic Management Relevance of Predictive Maintenance in Infrastructure

Advancements in civil infrastructure monitoring highlight the need for decision systems to foresee and avert major failures while efficiently using scarce resources amidst uncertainty (Bukhsh and Stipanovic 2020). This analysis examines PdM's impact at three interconnected levels: firm, portfolio, and territorial. At the firm level, it reshapes competition among contractors, construction firms, and technology providers, fostering performance-based contracts and data-driven innovation. At the portfolio level, it alters governance practices for asset managers and agencies by promoting risk-informed, life-cycle decision-making amid resource constraints. Finally, at the territorial level, PdM enhances the continuity of essential services, boosts infrastructure resilience, and ultimately delivers public value. Creating shared value (CSV) emphasizes the strategic role of prevention in advancing both competitiveness and social progress by tackling societal challenges through business practices. Predictive maintenance thus becomes essential for enhancing value creation, organizational legitimacy, and long-term asset performance, aligning with public value by supporting citizen well-being and governance. Both CSV and public value frameworks

position PdM as a means to harmonize private interests with societal needs and promote sustainability in infrastructure governance (OECD 2021).

Infrastructure governance is now understood to face non-technical barriers like information gaps and institutional biases favoring new construction over maintenance. The G20 Policy Agenda calls for life-cycle resilience and a people-centered approach to infrastructure. Similarly, an OECD paper supports a multidimensional, collaborative strategy across government levels and stakeholders to optimize existing assets and maintain consistent quality throughout their life-cycle (G20 2021). International asset management standards emphasize value realization throughout the asset life-cycle, framing asset management as the process of balancing performance, cost, and risk to achieve organizational objectives, recognizing that these elements can be both financial and non-financial. Predictive maintenance reshapes managerial trade-offs by introducing new information. It improves performance through better availability and service levels, changes cost profiles by affecting when and how predictably interventions occur, and lowers risk by reducing both the likelihood and impact of asset failure (Lee et al. 2025).

Risk management standards define risk in relation to objectives and uncertainty, emphasizing ongoing monitoring and communication throughout the decision process (ISO 2018). PdM enhances asset condition monitoring while introducing new uncertainties, including model inaccuracies and data quality issues. Research in SHM highlights that monitoring's effectiveness is contingent on data quality; inadequate data can lead to unnecessary or delayed actions. Therefore, the goal shifts from building precise predictive models to ensuring decision quality. It requires governance mechanisms that support reliable evidence interpretation, clear responsibility allocation, and timely action even under uncertainty. Recent research emphasizes sustainability as a multi-dimensional concept, and studies on maintenance strategies are now considering reliability, environmental impacts, and costs holistically (Liu et al. 2022). Risk-based life-cycle assessments reveal that climate-related deterioration affects both environmental and economic outcomes. This research advocates for a broader perspective on PdM, positioning it as a strategic approach for multi-objective life-cycle optimization rather than solely a cost-saving tool (Al Hawarneh et al. 2025).

Recent literature supports RQ1 by showing that infrastructure PdM is strategically important across multiple connected dimensions. First, PdM contributes to creating shared value (Porter and Kramer 2019) by enabling safe, reliable, and continuous service delivery, benefiting both asset owners and the communities that depend on them. Second, it supports the delivery of public value through accountable, transparent, and risk-informed governance of asset

portfolios, helping public owners meet societal expectations and regulatory commitments. Third, PdM supports sustainability by optimizing interventions and resource use over the asset life cycle, which lowers environmental impact, extends asset life, and improves long-term cost efficiency. These findings position PdM not as a peripheral technical tool, but as a strategic capability with the potential to reshape how infrastructure is governed, valued, and sustained over time (ISO 2024).

Digital Enablers and the Role of Project Management

PdM initiatives are implemented through portfolios of projects involving sensing deployment, data architecture, analytics development, and organizational change. As a result, project and program management are central to PdM outcomes, particularly in the infrastructure context, where assets are long-lived, safety-critical, and governed by multi-actor ecosystems. International standards such as ISO 21502 and ISO 21500 provide a relevant foundation for understanding PdM governance. They are especially pertinent because PdM encompasses both enabling projects, such as sensor deployment and data platform integration, and ongoing operations like continuous monitoring and maintenance execution (ISO 2020; ISO 2021).

Benefits realization management distinguishes between project outputs and strategic outcomes, emphasizing that project deliverables should align with organizational mission and strategy, as outlined in the PMI's framework. In infrastructure PdM, this involves defining expected benefits such as risk reduction and improved service continuity, establishing relevant KPIs, and ensuring project governance includes continuous benefit measurement beyond mere technical completion (Project Management Institute 2019). AI is enhancing SHM by automating visual inspections, processing sensor data, and improving predictions related to deterioration and useful life (Alqasi et al. 2024; Di Mucci et al. 2024). Integrated SHM frameworks consist of multiple modules for sensing, data transmission, preprocessing, damage identification, and early warning, helping inform maintenance decisions. Digital twins extend this capability by offering dynamic, real-time representations that incorporate diverse data sources for predictive analysis. However, reviews indicate that while digital twins for PdM offer significant prospects, they also present challenges in system complexity and computational requirements (Van Dinter et al. 2022).

Predictive maintenance transforms the evidentiary basis of maintenance decisions, increasing the importance of data integrity, traceability, and accountable execution across stakeholders. Research in the built environment has demonstrated architectures that integrate digital twins

with blockchain-based smart contracts to enable performance-based contracting. In such systems, the digital twin evaluates performance data, while blockchain ensures transparency and supports automated execution of performance assessments and rewards. Studies in infrastructure public-private partnerships (PPPs) report perceived benefits of blockchain-enabled smart contracts, including more autonomous contract administration and reduced misapplication of contractual provisions (Eze and Ameyaw 2025).

In critical infrastructure maintenance, trust and accountability are operational requirements that directly influence whether AI-generated alerts and decisions are acted upon. A blockchain-based framework for trustworthy AI addresses this by tracking dataset collection, model training, and inference generation through tamper-resistant ledgers. This supports non-repudiation and auditability, while enhancing explainability. Ultimately, it aims to ensure verifiable data lineage and certified inferences, strengthening confidence in AI-driven maintenance decisions (Severino et al. 2024). Predictive maintenance systems face challenges like noisy sensor data, the need for timely processing of large information volumes, and the difficulty of generalizing approaches across various infrastructure contexts. Research highlights that the quality of SHM data significantly impacts maintenance decisions, urging asset owners to prioritize data quality to avoid unnecessary interventions or missed opportunities for timely actions (Nunes et al. 2023). Taken together, AI, digital twins, and blockchain are transforming infrastructure maintenance governance. They create continuous, verifiable data streams that redefine evidence, enhance decision-making, and improve accountability in complex supply chains. This evolution shifts governance toward proactive, data-driven systems, supporting long-term strategic goals (Severino et al. 2024).

Minimum Cross-Asset Operational KPI Set

This section addresses RQ2. The proposed KPIs are cross-asset and non-technical in the sense that they do not aim to measure model accuracy, sensor calibration, or structural engineering state variables. Rather, they are intended to monitor the managerial performance of a PdM program by focusing on outcomes that matter to stakeholders, such as service continuity, safety-oriented risk exposure, and sustainability, as well as on the processes through which predictive signals are translated into accountable decisions and timely actions (GFMAM 2016). Four principles guided the selection of the proposed KPI set: (1) balance performance, cost, and risk; (2) be understandable to diverse stakeholders; (3) be measurable from realistic data sources; (4) keep to 10–12 core KPIs, with flexibility for asset-specific additions when needed (Berrabah et al. 2022; Hunhevicz et al. 2022).

Service and continuity KPIs

Infrastructure maintenance policy defines resilience as the ability to deliver safe, reliable, and high-quality services, while noting that maintenance is often neglected until failure occurs. To address this, three KPIs are proposed. Service Availability Index (SAI) measures steady-state service continuity; Unplanned Disruption Frequency (UDF) tracks unexpected service losses; and Mean Time to Restore Service (MTRS) assesses recovery capacity after disruption (G20 2021).

Safety and risk governance KPIs

SHM and PdM are driven by safety goals to monitor systems for damage detection and early warning. Two performance indicators are suggested: Risk-Adjusted Critical Failure Exposure (RCFE), which aligns with risk management frameworks by linking risk to objectives and uncertainty, and Safety-Critical Alert Closure within SLA (SCAC), which measures the timely assessment and closure of high-priority alerts to ensure governance accountability (Er-Ratby et al. 2025).

Timeliness KPIs across the decision chain

Predictive maintenance may not generate value if decision-making processes are sluggish or ambiguous. The Alert-to-Decision Lead Time (ADLT) and Decision-to-Intervention Lead Time (DILT) metrics differentiate between managerial and execution delays, aiding in the identification of issues stemming from governance and resource constraints. This strategy aligns with benefits realization thinking, highlighting the necessity for ongoing measurement and direction beyond just delivering technical outputs (GFMAM 2016).

Planning discipline and learning KPIs

Effective predictive maintenance requires two key managerial actions: preventing drift toward deferred work and ensuring budget credibility through life-cycle planning. These are measured by the Maintenance Backlog Index (MBI) and Maintenance Forecast Accuracy (MFA), respectively. The Intervention Effectiveness Rate (IER) complements them by assessing whether interventions achieve lasting results, supporting organizational learning.

KPI	Definition (unit)	Managerial rationale	Primary stakeholder(s)
Service Availability Index (SAI)	Share of time the asset meets the defined service level (%).	Captures the reliability of infrastructure from a user perspective, supporting portfolio-level service assurance and shared value.	Public owner/agency; asset managers; strategic executives.
Unplanned Disruption Frequency (UDF)	Unplanned service-impacting events per period (events/year), optionally criticality-weighted.	Reflects the effectiveness of PdM in preventing unforeseen failures by measuring reliability, complementing SAI through event incidence tracking.	Asset managers; public owner; operations management.
Mean Time to Restore Service (MTRS)	Average duration from disruption start to service restoration (hours/days).	Captures resilience and operational readiness; informs user-impact minimization.	Operations/maintenance; public owner; emergency management.
Risk-Adjusted Critical Failure Exposure (RCFE)	Portfolio-level indicator of exposure to critical failures, weighted by probability and consequence.	Integrates risk governance into strategic steering; aligns with risk-as-uncertainty-on-objectives logic.	Strategic executives; risk management; public owner/agency.
Safety-Critical Alert Closure within SLA (SCAC)	Safety-critical alerts formally closed within SLA time window (%).	Ensures accountability in responding to safety-relevant warnings; reduces gap between prediction and mitigation.	Asset managers; compliance/safety; contractors.
Verifiable Data Provenance Coverage (VDPC)	Monitoring/maintenance events anchored to verifiable provenance/audit trail (%).	Supports auditability, dispute prevention, and trusted automation in contracting and AI-assisted decisions.	Public owner; procurement; compliance; regulators.

Table 1. Managerial-technical interface KPI set of infrastructure PdM programs

Environmental and auditability KPIs

Maintenance decisions have direct environmental implications, and climate change can accelerate deterioration, thereby altering maintenance needs over time. Maintenance Carbon Intensity (MCI) is proposed as an indicator that informs environmental strategy without requiring a full technical life-cycle assessment. Verifiable Data Provenance Coverage (VDPC) measures the share of monitoring-to-decision-to-intervention records that are supported by verifiable provenance and audit trails. This KPI supports performance-based contracting and enables auditability of AI-assisted decisions (GFMAM 2016).

Data quality as a prerequisite

Data quality is considered a prerequisite for the proposed KPI set. Decision-focused research emphasizes its strong impact on maintenance decisions and recommends early investment in high-quality SHM data. Organizations should implement separate data quality dashboards and governance controls to support these KPIs. Tables 1 and 2 present the essential cross-asset operational KPI set for infrastructure PdM programs. Table 1 addresses service continuity, operational risk, safety, and traceability, while Table 2 covers planning, decision-making, intervention governance, and sustainability.

KPI	Definition (unit)	Managerial rationale	Primary stakeholder(s)
Alert-to-Decision Lead Time (ADLT)	Time from actionable alert to documented management decision (hours/days).	Diagnoses decision latency and governance bottlenecks in high-consequence systems.	Project managers; asset managers; governance boards.
Decision-to-Intervention Lead Time (DILT)	Time from decision approval to completion of mitigation action (days/weeks).	Measures execution capability and procurement/contracting effectiveness.	Operations/maintenance; procurement; project managers.
Maintenance Backlog Index (MBI)	Ratio of overdue/deferred risk-relevant actions to planned requirement (%).	Captures drift from proactive to deferred maintenance; supports strategic transparency.	Strategic executives; asset managers; finance.
Maintenance Forecast Accuracy (MFA)	Accuracy of maintenance forecast (e.g., absolute % error on work volume).	Connects PdM to budget discipline and credibility; supports life-cycle planning.	Finance; strategic executives; public budgeting.
Intervention Effectiveness Rate (IER)	Interventions achieving intended outcome without recurrence within defined window (%).	Prevents gaming based on activity volumes; focuses on outcome and learning.	Asset managers; contractors; quality management.
Maintenance Carbon Intensity (MCI)	kgCO2e per intervention or per service unit (kgCO2e/unit).	Operationalizes environmental dimension of shared value; informs low-carbon maintenance choices.	Sustainability; public owner; strategic executives.

Table 2. Managerial governance and value KPI set of infrastructure PdM programs

Future Directions and Conclusion

This study contributes to the discussion on achieving business excellence in challenging times by demonstrating how predictive maintenance can serve as a strategic innovation. In a global environment characterized by uncertainty and resource limitations, organizations must

leverage data-driven technologies to remain competitive and resilient. The proposed KPIs and strategic framework offer practical guidance for managers seeking to align maintenance decisions with long-term organizational performance, even under adverse conditions. Future research should shift its focus from purely conceptual development toward operationalization. As the literature indicates, a central challenge remains the translation of monitoring signals into accountable, timely, and sustainable decisions within multi-actor ecosystems (Bukhsh and Stipanovic 2020). This challenge becomes increasingly critical as emerging technologies, including digital twins, smart contracts, and trustworthy AI, reshape existing accountability structures and introduce new layers of governance complexity (G20 2021). An ongoing pilot project aims to implement the KPI framework within an AI-driven, human-centric decision support system. This applied research initiative, with scientific updates every three months, targets the completion of an advanced prototype by 2027. The pilot involves two large industrial buildings and other confidential assets, focusing on integrating continuous monitoring data with a decision layer to evaluate intervention alternatives while maintaining human accountability. Collaboration involves an industry network and a provider of sensing and measurement solutions.

From a research perspective, three directions are prioritized. First, empirical validation is needed to assess whether the proposed KPI set provides sufficient guidance for portfolio-level steering, and to establish thresholding and escalation rules that are recognized as legitimate by both private operators and public owners. Second, governance experiments should assess whether tamper-evident provenance mechanisms can measurably enhance auditability and stakeholder trust, particularly in contexts where AI models support risk classification, alert generation, and subsequent decision-making. Third, further research is needed to explore how benefits realization management and project governance frameworks can be adapted to predictive maintenance initiatives that span asset life-cycles, supply chains, and public accountability structures (Project Management Institute 2019; ISO 2021). In conclusion, the review asserts that PdM in infrastructure is a strategic management issue rather than just a technical innovation. This strategic aspect arises from its integration of reliable service delivery, accountable governance, and life-cycle asset management. The proposed KPI set serves as a robust managerial tool to complement existing technical systems, facilitating rigorous and transparent governance of PdM initiatives. By emphasizing stakeholder outcomes and accountability processes, the framework aids in making informed, sustainable decisions throughout the asset life-cycle. Further research is needed to validate and refine these indicators in practical settings (ISO 2024).

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Breaking Barriers Through Sport: Motivational Drivers of Athletes with Disabilities Participating in National and International Sport Events: The Case of Cyprus

Theofanous, Giannis[1], Yiapanas, George [1], Thrassou, Alkis [1]

[1]Gnosis: Mediterranean Institute of Management Science, School of Business, University of Nicosia, Cyprus

Keywords: Disability sport; Sport participation; Motivation; People with disabilities; Cyprus

Introduction

Sport participation has increasingly been recognised as a powerful mechanism for promoting social inclusion, empowerment, and wellbeing among people with disabilities (Ristevski et al., 2024; Oblak et al., 2023; Ballas et al., 2020; Darcy, Lock and Taylor, 2017). Over recent decades, global sporting events such as the Paralympic Games, World Para Sport Championships, and international disability sport competitions have significantly enhanced the visibility of athletes with disabilities and challenged dominant societal perceptions of disability (Mercado and McNamee, 2025). Despite this progress, limited empirical research has examined the motivations that encourage individuals with disabilities to engage in sport participation, particularly within smaller national contexts such as Cyprus.

Purpose, Aim and Research Questions

This study overarching aims to explore the motivations that encourage Cypriot athletes with disabilities to participate in sport events and competitions at local, national, and international levels. Understanding these motivations is particularly important for informing inclusive sport policies and for strengthening participation pathways within disability sport systems. The study is informed by Self-Determination Theory and existing literature on disability sport motivation, which emphasise the importance of intrinsic motivation, social belonging, personal empowerment, health and wellbeing, and achievement aspirations in shaping sport engagement.

To guide the investigation, the study addresses the following research questions: **RQ1:** What motivations encourage athletes with disabilities in Cyprus to participate in sport events and competition?

RQ2: How do athletes with disabilities experience participation in sport events and competitions?

RQ3: What social and environmental factors facilitate or constrain sport participation among athletes with disabilities?

Brief Literature Review and Conceptual Framework

Building on these perspectives, the study adopts a conceptual framework that considers how individual characteristics, motivational drivers, and contextual conditions influence sport participation among athletes with disabilities.

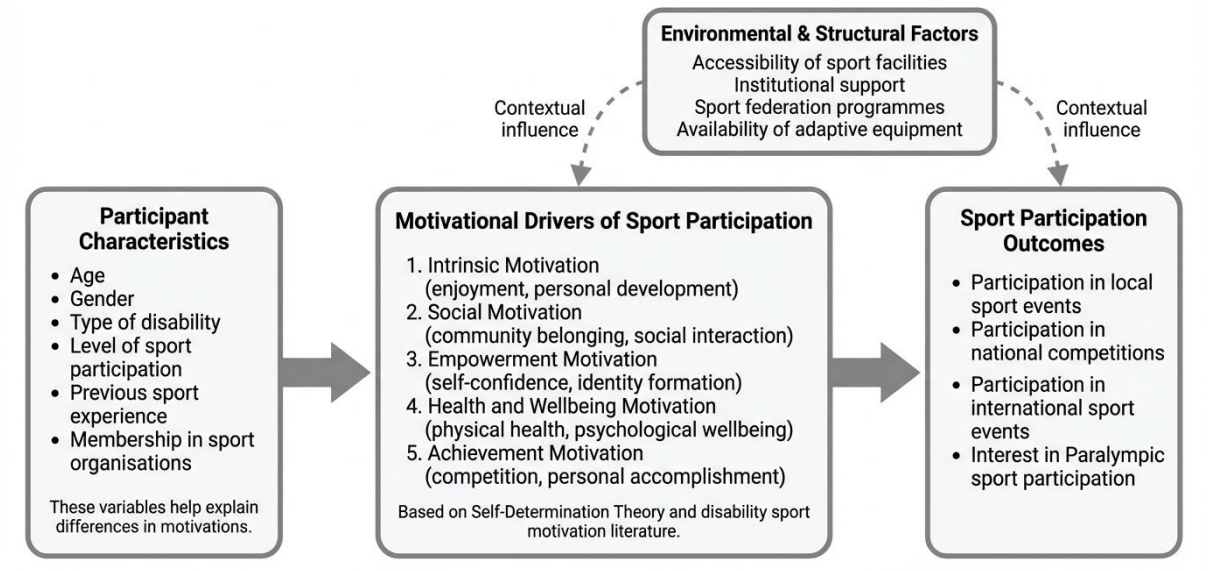


Figure 1. Conceptual framework of motivational drivers influencing sport participation among Cypriot people with disabilities. Source: Author's conceptualisation based on Self-Determination Theory and disability sport motivation literature.

The study is grounded in Self-Determination Theory (SDT), which emphasises the role of intrinsic and extrinsic motivation in shaping human behaviour, particularly through the fulfilment of three fundamental psychological needs: autonomy, competence, and relatedness. Within the context of disability sport, these needs may be expressed through opportunities for personal achievement, physical capability development, and social belonging within sport

communities. Previous research on disability sport consumption and participation also highlights additional motivational dimensions, including inspiration, social interaction, skill appreciation, and the desire to challenge stereotypes surrounding disability (Harthy, Hammad and Awed, 2024).

Methodology and Methods

To explore these dynamics, the study adopts a qualitative research design using semi-structured interviews with individuals with disabilities who are involved in sport activities through sport organisations, clubs, and national federations that are under the umbrella of the Cyprus Sport Organisation. The interviews aim to capture participants' personal experiences, motivations, and perceptions regarding sport participation, including their engagement in competitive sport environments and aspirations for participation in national or international sport events.

The collected data will be analysed using thematic analysis, allowing for the systematic identification of recurring patterns and themes emerging from participants' narratives. Through this approach, the study seeks to provide a deeper understanding of how motivational factors, social environments, and structural conditions interact to shape sport participation experiences among athletes with disabilities.

Expected Findings

The findings are expected to contribute to the growing body of research on disability sport by providing insights into the motivations and experiences of athletes with disabilities within the Cypriot context. Furthermore, the study aims to inform policymakers, sport organisations, and event organisers about the factors that encourage or hinder participation in disability sport, ultimately supporting the development of more inclusive and accessible sport environments.

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DESIGNING FAIR DYNAMIC TICKET PRICING: PSYCHOLOGICAL AND IDENTITY-BASED DRIVERS OF FAN ACCEPTANCE

Fratangeli, Beatrice[1]; Portaluri, Giorgio[1]; Vicentini, Francesca[1]; Mura, Rita[2]

[1]Department of Movement, Human and Health Sciences, University of Rome "Foro Italico", Rome, Italy

[2]Department of Economics, Industrial and Informational engineering, University of L'Aquila, L'Aquila, Italy

Keywords: Dynamic Ticket Pricing, Price Fairness, Sports Fans, Social Identity, Participatory Pricing, Fan Engagement

Introduction

Dynamic Ticket Pricing optimizes revenues by adjusting prices in real-time based on demand. However, in professional sports, DTP often triggers fairness concerns. Unlike traditional consumers, sports fans possess strong emotional attachments and social identities that shape their perceptions of "fair" transactions. Perceived unfairness can damage trust and long-term engagement.

Purpose, Aim And Objectives

This study examines the psychological, identity-based, and communicative factors influencing fan acceptance of DTP. It aims to: analyze the moderating role of team identification; test price framing effects on fairness and purchase intentions; and evaluate whether participatory pricing enhances fan loyalty.

Literature Review And Theoretical Framework

The study integrates Social Identity Theory (Tajfel & Turner, 1979), Prospect Theory (Kahneman & Tversky, 1979), and Price Fairness literature (Malc et al., 2016). While DTP research often prioritizes economic efficiency, few studies examine the identity-based mechanisms in sports. Team identification may buffer negative reactions to price changes, while Prospect Theory suggests fans react more intensely to perceived losses (price hikes) than gains. Participatory pricing, rooted in Service-Dominant Logic (Vargo & Lusch, 2004), is proposed as a tool for value co-creation.

Methodology And Methods

The study adopts a mixed-methods design. The qualitative phase combines semi-structured interviews with ticketing and marketing managers from Italian clubs with a netnographic analysis of fan interactions on social media related to pricing communications, to identify recurring emotional and linguistic frames associated with perceived fairness and price transparency. The second phase consists of an online 2×2 factorial experiment manipulating price variability and communication framing. The experiment measures perceived fairness, purchase intention, and attitudinal loyalty, while team identification is tested as a moderating variable through regression and moderation analyses.

Main Expected Findings And Contribution

The study hypothesises that high price variability and low transparency negatively affect perceived fairness and attitudinal loyalty, whereas strong team identification, gain-framed communication, and participatory pricing mechanisms may mitigate negative reactions and strengthen fan engagement.

Originality And Value

By linking revenue management with psychosocial and identity-based mechanisms, the research frames pricing as a relational and communicative practice rather than a purely revenue-driven tool.

Research Limitations

Potential limitations include contextual specificity across leagues and fan segments and the use of hypothetical experimental scenarios. Future research should examine longitudinal effects of DTP policies on fan loyalty and engagement.

Theoretical And Practical Application/Implications

The findings refine theoretical links between price fairness, social identity, and consumer behaviour in sports while offering practical guidance for transparent, fair, and participatory pricing strategies that support trust, long-term engagement, and the ethical integration of AI-driven pricing systems.

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A BIBLIOMETRIC ANALYSIS OF LEADERSHIP IN SUPPLY AND VALUE CHAINS IN THE CONTEXT OF INDUSTRY 4.0

Zalepūgaitė, Dovilė[1]; Serafinas, Dalius[2]

[1]Department of Management, Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania;

[2]Department of Management, Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania

Keywords: Leadership, Supply Chain, Value Chain, Industry 4.0, Bibliometric Analysis.

Abstract

This study aims to identify trends and themes in the analysis of leadership in supply and value chains in the context of Industry 4.0. A bibliometric analysis was conducted to examine publication and citation frequencies, journals publishing in the field of study, trends identified through keyword frequency analysis, and thematic trends derived from clustering based on keyword co-occurrence.

We found that research on leadership in supply and value chains in the context of Industry 4.0 is relevant. This is evidenced by a steady increase in the number of papers and citations between 2018 and 2021, a significant increase in 2022, and further growth in publications in more recent years, specifically 2024–2025. Recognising that leadership in the context of Industry 4.0 is more often studied through a supply chain rather than a value chain lens, and that research focuses on supply chain, supply chain management, and implementation, a lack of research on leadership in value chains became apparent. We identified two cluster structures within the field of study and key research areas: one focusing on management, performance, and sustainability, and the other on Industry 4.0, supply chain, and leadership. We found that various relationships with leadership, as independent variables and as mediators or moderators, have been examined from different perspectives, including both individual- and organisational-level leadership.

By surveying the research landscape on leadership in supply and value chains, taking into account the context of Industry 4.0, we have derived valuable insights into prevailing trends. We have formulated suggestions for future research directions that account for the topic's increasing relevance and the need to continue examining it in the context of evolving circumstances and conditions, such as achieving sustainable development.

Introduction

The Industry 4.0 context has fostered debate about the role of leadership competencies and leadership styles in organisational performance and the success of digital transformation outcomes (Senadjki et al., 2024). The type of transformational or evolutionary change and the organisation's perception of its place in the business ecosystem determine the prevailing leadership style, the level of managerial involvement, and the organisation's cultural aspects (Volberda et al., 2021). When discussing supply chain leadership, the focus shifts from the interpersonal level to the inter-organisational level, examining the impact of leadership style expression across the supply chain using different leadership theories (Mokhtar et al., 2019). Research findings on inter-organisational leadership guide analysis of supply chain management and shared value creation (Fontoura & Coelho, 2020).

The importance of leadership and its impact remain relevant in the contemporary context (Antony et al., 2023; Dias et al., 2022; Malik et al., 2025; McTaggart & Loonam, 2024; Prabhu & Srivastava, 2023). Various studies have examined the essential characteristics of leaders in the implementation of digital technologies (Dias et al., 2022; Firk et al., 2022; Malik et al., 2025; Szelagowski & Berniak-Woźny, 2024). There is also growing demand to explore leadership in the supply chain and to create shared value with supply chain partners (Fontoura & Coelho, 2020).

Using a bibliometric approach, the present study aims to identify trends and themes in the analysis of leadership in supply and value chains in the context of Industry 4.0, leading to the following research questions:

(RQ1) What research trends exist around leadership in supply and value chains in the context of Industry 4.0?

(RQ2) What relevant thematic areas of publications on leadership in supply and value chains exist in the context of Industry 4.0?

This paper is structured as follows. First, the theoretical background is presented. After a detailed description of the bibliometric analysis methodology, we present the results. Next, we detail our conclusions, followed by insights for future research and a discussion of research limitations.

Theoretical Background

The links between leadership and the supply chain have been discussed in the scientific literature (Ali et al., 2024; Chen et al., 2021; Fontoura & Coelho, 2020; Mokhtar et al., 2019;

Prabhu & Srivastava, 2023). Leadership in supply chains has been discussed at the inter-organisational level (Ali et al., 2024; Chen et al., 2021) and considered from the perspective of its impact on supply chain management (Mokhtar et al., 2019; Prabhu & Srivastava, 2023), performance (Chen et al., 2021; Fontoura & Coelho, 2020) and value creation (Fontoura & Coelho, 2020). Different forms of supply chain leadership forms have been examined, from the individual organisation to the supply chain level, with varying impacts on organisational performance (Chen et al., 2021).

The importance of leadership has been emphasised in the context of digitalisation (Alblooshi et al., 2021; Ali et al., 2024; Faiz et al., 2024; Fontoura & Coelho, 2020; Senadjki et al., 2024; Wang et al., 2025). In the contemporary environment, the importance of leaders who are aware of the overall situation of the organisation and who are able to manage the needs and expectations of stakeholders has become increasingly apparent (Fontoura & Coelho, 2020). Leadership within organisations is essential to achieve the intended goals of digital technology adoption and use (Faiz et al., 2024). An appropriate leadership style could not only have an impact on organisational performance (Alblooshi et al., 2021; Ali et al., 2024), but also determine the success of digital transformation outcomes (Senadjki et al., 2024). In the context of digital transformation, supply chain leaders could not only foster digital linkage across supply chains by using such tools as market-based incentives, shared technologies or information, but could also increase the digitalisation gap within them (Wang et al., 2025).

Although the links between leadership and the supply chain on the one hand, and leadership and digitalisation on the other hand, have been examined in the scientific literature, the field remains fragmented. This bibliometric analysis will consider all these elements together and identify trends and themes in the research of leadership in both supply and value chains in the context of Industry 4.0.

Methodology

A bibliometric approach was chosen to achieve the study aim, as bibliometric research methods allow researchers to synthesise existing research on prevaling themes (Dhamija et al., 2023; Zupic & Čater, 2015) and aseess the development and relevance of a topic (Espina-Romero et al., 2023).

The first step in the bibliometric analysis involved selecting the databases and forming search strings. To obtain a more diverse set of results and a more in-depth bibliometric analysis, two databases were selected for the record search: Scopus and Web of Science (Tigre et al., 2023).

The database records were obtained in September 2025. Then, the search strings were formed, comprising: (‘leadership’ OR ‘leadership style*’ AND ‘value chain’ AND (‘Industry 4.0’ OR ‘I4.0’ OR ‘fourth industrial revolution’). The databases were searched for records using title, abstract, and keyword terms without a time span. Unfortunately, the initial search yielded only 37 records (23 from Scopus and 14 from Web of Science). To broaden the search, the keyword ‘supply chain’ was added to the search string, given that the sustainable value chain model encompasses supply chain operations (Centobelli et al., 2023). Table 1 presents the final search strings applied.

Scopus	TITLE-ABS-KEY ((‘leadership’ OR ‘leadership style*’) AND (‘value chain*’ OR ‘supply chain*’) AND (‘Industry 4.0’ OR ‘I4.0’ OR ‘fourth industrial revolution’))
Web of Science	TS= ((‘leadership’ OR ‘leadership style*’) AND (‘value chain*’ OR ‘supply chain*’) AND (‘Industry 4.0’ OR ‘I4.0’ OR ‘fourth industrial revolution’))

Table 1: Search Strings Applied in Database Searches (Scopus and Web of Science)

The records from the databases mentioned were obtained in September 2025. Using the search strings provided in Table 1, a total of 135 records were found (68 in Scopus database and 67 in Web of Science). Following Espina-Romero et al. (2023), the filters shown in Table 2 were applied to improve the search results. Timespan for publications was not used to filter records.

Scopus	Subject area: Business, Management and Accounting Language: English Source type: journal
Web of Science	Web of Science categories: Management and Business Language: English Document types: article, review article, early access, proceeding paper

Table 2: Filters Applied in Database Searches (Scopus and Web of Science)

After applying the filters presented in Table 2, 28 records remained from the Scopus database and 34 records from Web of Science. Fifteen records were removed due to duplication. As such, the total number of records in the bibliometric analysis is 47. The complete bibliometric data of the selected records were exported from the Scopus and Web of Science databases in RIS format. Both bibliometric data files were imported into Zotero and exported as a single RIS file for visualizations in VOSviewer and as a CSV file for data analysis in Microsoft Excel.

The bibliometric analysis was conducted using Microsoft Excel and VOSviewer (version 1.6.20). Microsoft Excel was used for paper and citation counts, and for top-journal analysis; VOSviewer was used for network and overlay visualisations of keyword occurrence analysis

(Van Eck & Waltman, 2010). In VOSviewer, the minimum number of occurrences of a keyword was set to 4. The counting method was selected as full counting. Additionally, the total strength of co-occurrence links with other keywords was calculated in VOSviewer. A thesaurus file was also developed. Keywords 'Industry 4' and 'Industry 4.0' were merged into 'Industry 4.0', and 'Supply chains' and 'Supply chain' were merged into 'Supply chain' because they represent the same concept. Finally, the '0' keyword was excluded.

Results

Analysis of paper and citation numbers

A graphical representation of the data on the number of papers and citations per year appears in Figure 1, including the total number of citations in Web of Science (filtered by Web of Science Core Collection) and Scopus (filtered by 'Cited by').

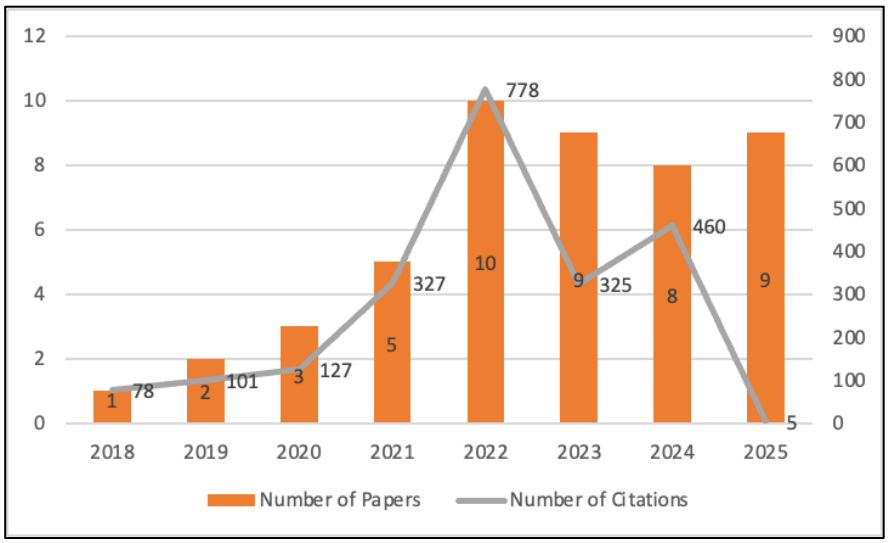


Figure 1: Number of Papers and Citations Per Year (2018–2025)

A consistent increase in the number of papers and citations in the databases was observed between 2018 and 2021, with a significant increase in both numbers in 2022. The number of articles was highest in 2022; in subsequent years, it remained above 8 per year. Meanwhile, the number of citations per year fell by more than half in 2023 before rising again in 2024. Given that the number of papers increased again in 2025, a higher number of citations is expected for 2025 in subsequent years, due to the citation time lag, a function of the novelty of the articles. In summary, although the topic remained relevant, as evidenced by the number of papers published in 2022–2025, the number of citations decreased significantly in 2023, only to increase substantially again (to 460 citations) in 2024.

Analysis of top journals

The journals with the most papers published between 2018 and 2025 were the *International Journal of Logistics Management* (3 papers), *IEEE Transactions on Engineering Management* (3 papers), *International Journal of Technology* (2 papers), *Journal of Enterprise Information Management* (2 papers), and *Logistics* (2 papers). Among the top five papers by number of citations, two were published in *IEEE Transactions on Engineering Management* (Bag et al., 2024; Chatterjee et al., 2024), and one was published in *Logistics* (Frederico, 2021). The other two most-cited papers were published in journals outside the top five: *Business Strategy and Environment* (Mukhuty et al., 2022) and *International Journal of Productivity and Performance Management* (Bag et al., 2022).

Keyword co-occurrence network analysis

Using the full counting method in VOSviewer, 17 out of 374 keywords met the threshold (the minimum number of occurrences of a keyword was set to four). Other keywords occurred below the threshold in papers selected for bibliographic analysis. The most frequently recurring keywords in the papers selected for bibliographic analysis were ‘Industry 4.0’ (36), ‘supply chain’ (18), ‘management’ (12), ‘performance’ (10), ‘sustainability’ (9), ‘framework’ (8), ‘supply chain management’ (8), ‘challenges’ (7), ‘circular economy’ (7), ‘leadership’ (7), ‘implementation’ (6), ‘logistics’ (6), ‘future’ (5), ‘systems’ (4), ‘context’ (4), ‘manufacturing’ (4), and ‘digital transformation’ (4). Based on bibliographic data, a keyword co-occurrence network map was created (Figure 2). Analysis of that map revealed a two-cluster structure: Cluster 1 (the red cluster) and Cluster 2 (the green cluster). The nature of these clusters is discussed in the following pages.

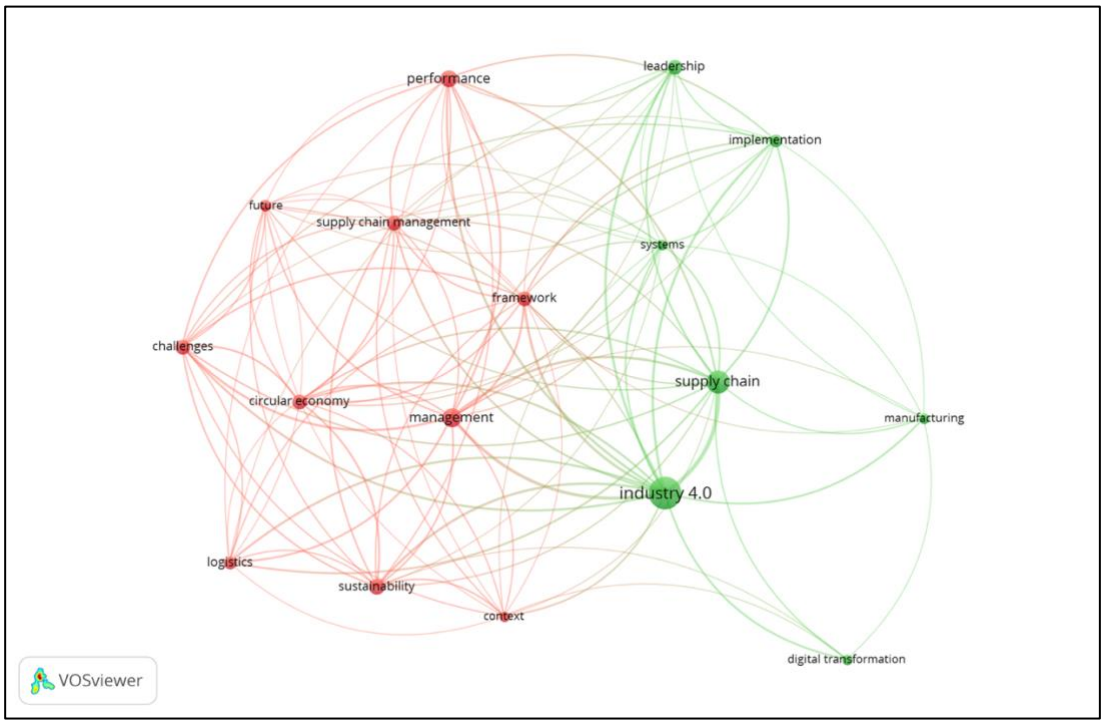


Figure 2: Keyword Co-occurrence Network Map

Cluster 1 analysis

Cluster 1 (the red cluster) includes 10 keywords: 'challenges', 'circular economy', 'context', 'framework', 'future', 'logistics', 'management', 'performance', 'supply chain management', and 'sustainability'. Cluster 1, along the central axis, is distinguished by 'management', 'performance', and 'sustainability'. This cluster emphasizes the importance of managerial aspects and context in both the preparation for and the implementation of Industry 4.0, as well as the related challenges and opportunities.

The scientific literature has studied aspects of Industry 4.0 readiness (Asrol, 2024; Govindan & Arampatzis, 2023), Quality 4.0 (Shayan & Moghadam, 2026), and integration with the circular economy (Azizov, 2024; Saha et al., 2025; Silva & Sehnem, 2022). The importance of leadership in supply chain management (Prabhu & Srivastava, 2023) and in the implementation of Quality 4.0 principles (Shayan & Moghadam, 2026) has been noted, with the integration of Industry 4.0 with the circular economy explored by setting an agenda for its promotion (Silva & Sehnem, 2022) and for the effective implementation of change (Saha et al., 2025). Assessments of the circular innovation framework encompass both managerial and technological dimensions to advance sustainable circular chains (Azizov, 2024).

Research papers have addressed the challenges of implementing Industry 4.0 (Govindan & Arampatzis, 2023) and Supply Chain 4.0 (Gaur et al., 2025). Leadership as a barrier to Industry 4.0 (Govindan & Arampatzis, 2023) and top management commitment to Supply Chain 4.0

(Gaur et al., 2025) have been identified. The challenges associated with sustainable development in the context of Industry 4.0 have also been examined (Mukhuty et al., 2022; Nirmal et al., 2025). Mukhuty et al. (2022) investigated complementary human resources-related barriers to the sustainable development of Industry 4.0, while Nirmal et al. (2025) examined the factors that influence the link between sustainable practices and performance in Industry 4.0 and the associated challenges to achieving sustainability. In addition, the paper examined barriers to integrating the circular economy and Industry 4.0 into the manufacturing industry supply chain (Gadekar et al., 2022); barriers to circular supply chain transformation in the context of Industry 4.0 (Shang et al., 2022); and barriers to implementing digital fabrication in the circular economy, among which leadership stands out as a challenge (Bag et al., 2022).

The opportunities for creating value in supply chains driven by Industry 4.0 have been discussed (Bamel & Bamel, 2021; Bastug et al., 2020; Chauhan et al., 2023; Zhou et al., 2022), covering opportunities to achieve cost leadership in seaport value chains (Bastug et al., 2020), to improve quality and economic performance (Zhou et al., 2022), to increase supply chain resilience (Chauhan et al., 2023), and to improve supply chain capabilities and competitiveness (Bamel & Bamel, 2021).

Cluster 2 analysis

Cluster 2 (the green cluster) includes seven keywords: ‘digital transformation’, ‘implementation’, ‘Industry 4.0’, ‘leadership’, ‘manufacturing’, ‘supply chain’, and ‘systems’. Cluster 2, along the central axis, is distinguished by ‘Industry 4.0’, ‘supply chain’, and ‘leadership’. The cluster investigates individual and organisational leadership in Industry 4.0 and the implementation of Industry 4.0 in supply chains.

The importance of individual leadership in the implementation of Industry 4.0 has been explored, including the need for strong leadership (Fonseca, 2018) and the critical role of digital transformation elements, including leadership (Abdallah et al., 2022). The analysis of Industry 4.0 developments highlighted leadership and employee-related factors important for the long-term success of Industry 4.0 implementation (Peña & Caruajulca, 2022). Maintaining employee motivation has been recognised as a challenge in the context of digital transformation (Sorko & Brandstätter, 2020), while a lack of leadership, top management support, and digital supply chains is seen as a critical barrier to Industry 4.0 implementation (Sony et al., 2024).

The scientific literature has emphasised individual and organisational leadership, with different individual leadership styles in companies having been found to have different effects in a technological context (Dhamija et al., 2023). Several moderating effects of leadership have

been explored: the moderating effect of innovative leadership on the link between big data analytics and a responsive supply chain (Bag et al., 2024); and the moderating effect of leadership support on the link between the adoption of new technologies and firm performance (Chatterjee et al., 2024).

Transformational leadership has been the subject of more extensive research, with studies investigating the role of the transformational-style leader and the influence of internal and external factors on the adoption of Industry 4.0 technologies in the manufacturing sector (Chumnumporn et al., 2022) and the role of transformational-leadership–driven ambidexterity in improving innovation performance (Azizi et al., 2025). Research has also examined the potential of implementing Industry 4.0 technologies to enhance organisational-level leadership, while accounting for external operating factors. Elsewhere, firm leadership in the sector has been assessed in the context of Industry 4.0, with a focus on fostering collaboration and innovation and pushing technological boundaries (Fu et al., 2021), with one study considering long-term leadership and success in the sector through harnessing Industry 4.0 potential (Safavi Jahromi & Ghazinoory, 2024). Finally, the impact of external factors on the adoption of Industry 4.0 in the manufacturing sector has been investigated in the context of ambitions to operate in local and international markets (Lan & Jeenanunta, 2023) or to achieve market leadership (Omar et al., 2019).

Keyword co-occurrence temporal analysis

The final step in the bibliometric analysis involved including the year of publication in the keyword co-occurrence network map (Figure 3).

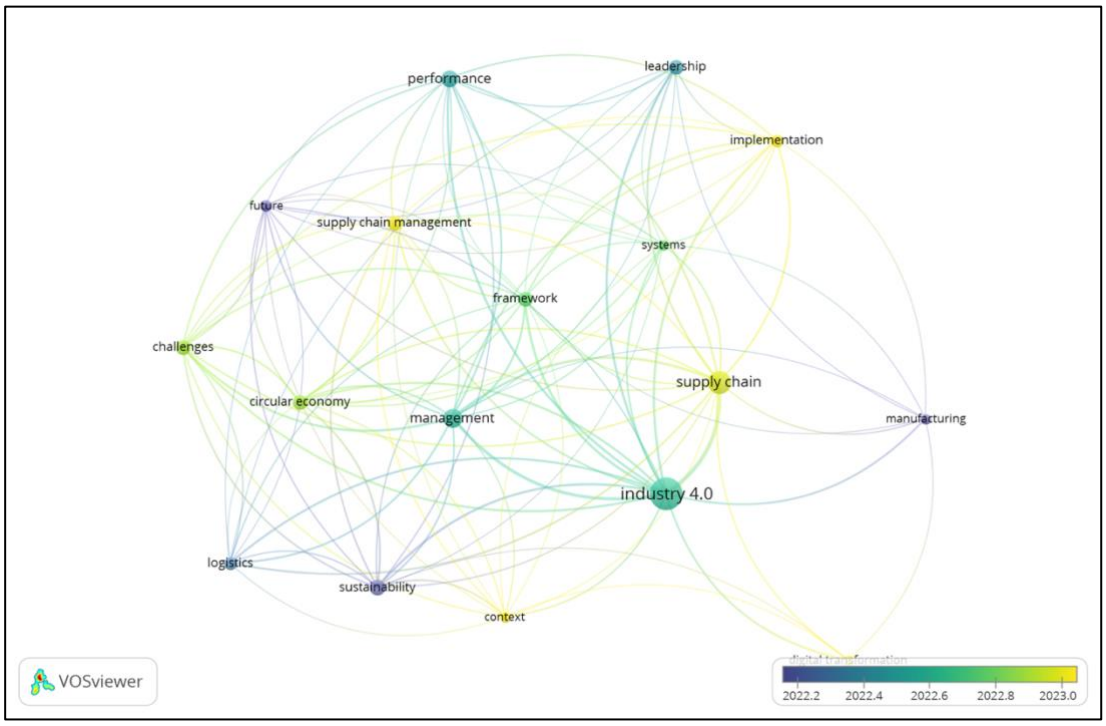


Figure 3: Keyword Co-occurrence Network Map with Temporal Analysis

This analysis found that academic research increasingly focuses on ‘supply chain’, ‘supply chain management’, and ‘implementation’. Comparing the dynamics of keywords across the periods presented revealed a recent trend toward research on the implementation of Industry 4.0 in supply chains and management.

Conclusions

The relevance of research on leadership in supply and value chains and the necessity of continued examination in the context of new circumstances and opportunities have been identified. From 2018 to 2021, the number of papers and citations related to these concerns increased steadily; in 2022, it increased significantly. In terms of publication frequency, the *International Journal of Logistics Management* and the *IEEE Transactions on Engineering Management* both demonstrated a strong focus on the topic. Notably, research on supply chains, supply chain management, and implementation became increasingly relevant in 2023, as evidenced by the analysis of the keyword co-occurrence network map. In 2025, the number of papers in the field continues to increase, indicating that the topic of leadership in supply and value chains in the context of Industry 4.0 remains relevant.

The analysis also revealed that the link between leadership in the Industry 4.0 context and the value chain is insufficiently studied. Leadership in the Industry 4.0 context is more often

researched in conjunction with the ‘supply chain’ element than with the ‘value chain’ element. A lack of research on leadership in conjunction with the ‘value chain’ element is thus identified. Additionally, the popularity of research on supply chains is confirmed by the results of the keyword co-occurrence network analysis, which show that academic research increasingly focuses on ‘supply chain’, ‘supply chain management’, and ‘implementation’. When formulating a search string with the terms ‘leadership’, ‘Industry 4.0’, and ‘value chain’ in the Scopus and Web of Science databases, insufficient entries appeared for bibliometric analysis. As such, to determine how leadership in value and supply chains is analysed in the context of Industry 4.0, ‘supply chain’ had to be included in the search string.

The research clusters reveal a research focus on management, performance, and sustainability on the one hand, and Industry 4.0, supply chain, and leadership on the other. After creating a keyword co-occurrence network map, we identified a two-cluster structure that revealed various notable insights: the first cluster captured the importance of management and context in both preparation for and implementation of Industry 4.0, and the challenges and opportunities associated with it; the second cluster identified personal and organisational leadership in Industry 4.0 and the implementation of Industry 4.0 in supply chains. In summary, the extant research addresses a range of relationships in which leadership serves as either an independent variable, a mediator, or a moderator, with analyses conducted at both personal and organisational levels.

Research Limitations

This bibliometric analysis identifies current trends around research on leadership in value and supply chains in the context of Industry 4.0. However, several research limitations should be addressed. This bibliometric analysis included records from Scopus and Web of Science, which may have influenced the results by excluding potentially valuable insights from publications in other databases. Additionally, an English-language filter was applied to the records, which may have excluded records published in other languages and relevant to the study’s purpose from this bibliometric analysis.

Future Research Directions

Having identified a trend toward greater emphasis on leadership and the supply chain in Industry 4.0, we suggest expanding research on leadership within the value chain in this context. Future studies could investigate leadership both in terms of preparedness and implementation

of Industry 4.0 technologies in value chains. We also suggest broadening the scope of research on sustainable development in light of research trends and the integration Industry 4.0 with sustainable development principles. Further research could deepen the understanding of the leadership-related elements in supply and value chains that are crucial for achieving sustainable development. Finally, future studies could use additional or alternative databases beyond Scopus and Web of Science and include publications in languages other than English in the bibliometric analysis.

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DRIVING OR WORKING? JUSTICE AND NORMS IN COMMUTING

Turgeman-Lupo, Keren[1]; Biron, Michal[2]; Tzafrir, Shay[2]

[1]School of Management & Economics, The Academic College of Tel Aviv-Yaffo, Tel Aviv-Yaffo, Israel

[2]School of Business Administration, University of Haifa, Haifa, Israel

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Introduction

Commuting accidents constitute a substantial occupational risk and account for a considerable proportion of work-related injuries (Burch and Barnes-Farrell, 2020). Yet relatively little is known about the organisational and social conditions under which work-related strain becomes translated into risky commuting behaviour.

Purpose, Aim and Objectives

This study examines whether need for recovery, reflecting depleted personal resources, is associated with unsafe commuting behaviour, and whether this association depends on perceived organisational justice and referent peer commuting norms. We test a moderated-moderation model in which organisational justice attenuates this association, while peer norms further shape the buffering effect.

Literature Review and Theoretical Framework

Prior commuting research has examined individual characteristics, commuting conditions and work-related stressors as predictors of safety-related outcomes (e.g., Calderwood and Mitropoulos, 2021). Building on this work, we shift attention from isolated predictors to contextual processes. Drawing on Conservation of Resources theory (Hobfoll, 2001), need for recovery is conceptualised as reduced regulatory and attentional capacity. Organisational justice may shape how employees interpret and respond to strain; prior research shows that justice can buffer the negative effects of emotional exhaustion (Hur et al., 2014). Referent peer norms may also provide behavioural anchors by signalling whether unsafe commuting practices are socially tolerated or discouraged.

Methodology and Methods

Data were collected at two time points from 102 employees working in a large electronics manufacturing plant, all of whom commuted to work by car. The hypotheses were tested using moderated-moderation analyses with PROCESS macro for SPSS (Model 3; Hayes, 2022).

Findings and Contribution

Need for recovery was not directly associated with unsafe commuting behaviour. However, organisational justice significantly moderated this association: need for recovery was positively associated with unsafe commuting behaviour only when justice perceptions were low. A significant three-way interaction further showed that, under low organisational justice, need for recovery predicted unsafe commuting behaviour when referent peer norms were permissive; this association disappeared when norms were restrictive. Under high justice, need for recovery was unrelated to unsafe commuting behaviour regardless of peer norms. These findings show that commuting risk is not merely an individual response to strain, but a contextually embedded behaviour shaped by organisational fairness and peer norms.

Originality and Value

By integrating organisational justice and referent commuting norms, this study shows that work-related strain may translate into unsafe commuting behaviour under specific organisational and social conditions. It connects traffic psychology with organisational behaviour by positioning the workplace as an influential context in everyday mobility.

Research Limitations

The study relied on self-report data and was conducted within a single organisation, which may limit generalisability. Although data were collected at two time points, the design does not allow definitive causal inference, and common method concerns should be considered (Podsakoff et al., 2003).

Theoretical and Practical Applications and Implications

The findings refine COR-based explanations of stress-related behaviour by highlighting contextual moderators (Hobfoll, 2001). Practically, enhancing organisational justice and strengthening restrictive peer norms may reduce unsafe commuting behaviour, particularly among employees with high recovery needs.

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BALANCE OF INTEREST: AN AI-ENABLED MANAGEMENT SIMULATION FOR LEADERSHIP DEVELOPMENT

Monauni, Max[1]

[1]Institute of Financial Services Zug IFZ, Lucerne University of Applied Sciences and Arts, Zug, Switzerland

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Abstract

High-stakes stakeholder communication is central to leadership but remains difficult to train through conventional formats. Role plays and classroom discussions often lack realism, scalability, and systematic feedback, while real-world experience involves high risk and limited opportunities for reflection. This paper presents Balance of Interest (BOI), an AI-enabled management simulation designed as a low-risk, high-feedback learning environment for developing strategic stakeholder communication and leadership competencies.

Following a Design Science Research approach, BOI is developed and evaluated as a socio-technical artefact that combines (1) AI-based CXO personas with distinct motivational logics, (2) a transparent dual-metric system capturing both technical quality and stakeholder commitment, and (3) layered feedback mechanisms enabling real-time and reflective learning. The simulation has been implemented in multiple workshops with heterogeneous participant groups, involving over 100 participants across approximately 30 teams.

Formative observations across these implementations suggest that BOI can foster sustained engagement, collaborative reflection, and iterative experimentation with communication strategies. Participants are prompted to externalise otherwise implicit assumptions, negotiate competing stakeholder interests, and adapt leadership behaviour across roles. Learning appears to emerge not through optimisation of a single solution, but through navigating tensions between competing values, interests, and power dynamics.

The paper contributes to Human Resource Development and Leadership research by (a) demonstrating how AI-enabled simulations may augment experiential learning, (b) proposing design principles for psychologically safe yet demanding leadership development environments, and (c) discussing implications and limitations of AI-mediated feedback in HRM contexts.

Introduction

Organisations increasingly depend on managers' ability to navigate complex stakeholder landscapes, particularly under conditions of uncertainty, asymmetric information, and significant consequences. Strategic initiatives—such as control systems, digital transformations, or restructurings—require not only technical expertise but also persuasive communication with senior decision-makers who hold divergent interests and risk perceptions. Despite its relevance, this form of high-stakes communication remains difficult to train systematically.

From a leadership development perspective, this challenge is structural in nature. High-stakes communication occurs infrequently, is associated with personal and organisational risk, and leaves little room for experimentation. Managers are expected to perform despite limited opportunities for realistic practice, which means that communication strategies often remain implicit rather than deliberately reflected upon (Kolb, 1984).

Traditional learning formats face inherent limitations. Classroom instruction struggles to recreate political and emotional complexity, while role plays may generate anxiety and provide limited documentation and feedback for reflection (Salas et al., 2009).

Recent advances in artificial intelligence—particularly large language models (LLMs)—open new possibilities for management education and HRD. AI-driven conversational agents can simulate complex interactions, adapt dynamically, and provide immediate feedback. While AI has been studied in training and decision support, less is known about how AI-enabled simulations can support the development of high-stakes communication (Raisch and Krakowski, 2021; Davenport and Kirby, 2016).

This paper addresses this gap by presenting Balance of Interest (BOI), an AI-enabled management simulation fostering reflective, team-based learning in high-risk communication contexts. Participants assume the role of a CFO introducing a controlling system, balancing technical quality with stakeholder commitment across divergent executive agendas. Through iterative dialogue, feedback, and debriefing, BOI makes implicit communication strategies explicit and collectively discussable.

The study follows a Design Science Research approach and contributes by introducing BOI as an AI-enabled leadership development artefact, providing formative insights across heterogeneous contexts, and deriving transferable design principles for simulations targeting high-stakes communication.

Theoretical Background

High-stakes communication in HRD and leadership development

High-stakes managerial communication refers to interactions in which outcomes have significant organisational and personal consequences, often involving senior stakeholders, power asymmetries, and conflicting interests. From an HRD perspective, such interactions are closely linked to leadership

effectiveness, change readiness, and organisational alignment (Yukl, 2013). However, these competencies are notoriously difficult to operationalise and assess, as they manifest as situational, context-dependent behaviours rather than standardised skill sets.

Research on leadership development emphasises that such capabilities are primarily developed through experience and reflection rather than formal instruction (Day et al., 2014). Yet real-world experiences are unevenly distributed, risky, and rarely accompanied by systematic feedback. This creates a paradox: the situations that matter most are the least suitable for learning through trial and error.

Experiential and simulation-based learning

Experiential learning theory provides a foundational lens for addressing this paradox. According to Kolb (1984), learning emerges through a cycle of concrete experience, reflective observation, abstract conceptualisation, and active experimentation. Management simulations and serious games operationalise this cycle by creating safe environments in which learners can experiment with decisions and observe consequences without real-world repercussions (Garris et al., 2002).

Simulation-based learning has been shown to support deeper engagement, higher motivation, and improved transfer of learning compared to purely didactic methods (Salas et al., 2009). However, traditional simulations often rely on predefined decision trees or static scenarios, limiting their ability to represent nuanced social interactions such as negotiation, persuasion, or informal power dynamics—central elements of high-stakes communication.

Psychological safety, motivation, and team-based learning

Effective leadership development environments must balance challenge with psychological safety. Psychological safety enables learners to experiment, make mistakes, and engage in honest reflection without fear of negative social consequences (Edmondson, 1999). In team-based learning settings, this safety is crucial for surfacing implicit assumptions and communication strategies that would otherwise remain unexamined.

Motivation further mediates learning effectiveness. Gamification research highlights the importance of autonomy, competence, and relatedness in sustaining engagement, as well as the role of meaningful narratives and feedback loops (Hamari et al., 2014). In leadership simulations, motivation is not merely a byproduct but a prerequisite for sustained engagement with complex, cognitively demanding tasks.

AI-enabled learning environments in HRD

AI technologies are increasingly discussed as enablers of personalised learning, coaching, and decision support in HRM contexts (Davenport and Ronanki, 2018). LLM-based conversational agents allow for dynamic, context-sensitive interaction that more closely resembles real managerial dialogue. Yet their use in leadership and organisational learning remains under-theorised.

Existing studies caution against viewing AI as a substitute for human judgment or social interaction. Instead, AI can function as a learning infrastructure that scaffolds reflection, feedback, and sense-making (Raisch and Krakowski, 2021). Designing such systems requires careful consideration of transparency, bias, anthropomorphic interpretations of AI agents, and the balance between realism and abstraction—issues that are especially salient in high-stakes communication training.

Research Approach: Design Science Research

This study follows a Design Science Research (DSR) approach, which is particularly suited for investigating complex socio-technical phenomena through the purposeful design and evaluation of artefacts (Hevner et al., 2004; vom Brocke et al., 2020). DSR aims not only to explain existing phenomena but to generate prescriptive knowledge by building and refining artefacts that address relevant organisational problems.

The core problem addressed in this study—developing high-stakes managerial communication capabilities under conditions of uncertainty and risk—cannot be adequately examined through ex-post observation alone. Instead, it requires the intentional creation of a learning environment in which communication strategies can be enacted, observed, and reflected upon in real time. BOI therefore functions as both a research instrument and an intervention, aligning well with the problem-solving orientation of DSR.

Following established DSR guidelines, the research process comprised three iterative phases: problem identification based on HRD, leadership, and experiential learning literature; design and development of the BOI artefact, including AI personas, commitment mechanisms, and debriefing architecture; and formative evaluation across multiple workshop implementations with heterogeneous participant groups.

Consistent with contemporary DSR perspectives, this study does not aim to test causal hypotheses but to derive design knowledge in the form of transferable principles (Gregor and Hevner, 2013). Empirical observations are therefore used formatively, not statistically, to assess whether and how the artefact appears to enable the intended learning processes.

Artefact: Design, Architecture, Learning Mechanisms

Overview of the BOI simulation

Balance of Interest (BOI) is an AI-enabled, browser-based management simulation designed for team-based learning in HRM and leadership contexts. Participants assume the role of a Chief Financial Officer (CFO) tasked with introducing a new controlling system within an organisation. Successful implementation requires navigating a deliberate tension between the two objectives of Technical Fit

(maintaining sufficient functional quality of the controlling system) and Stakeholder Commitment (securing buy-in from key executive stakeholders).

The simulation is explicitly not about finding the single "optimal" solution. Instead, it foregrounds trade-offs, negotiation, and adaptive communication—core elements of managerial work that are often underrepresented in traditional simulations.

Stakeholder personas as AI-based CXOs

A central design feature of BOI is the use of four AI-based executive personas representing typical top-management roles: CEO, COO, Head of HR, and Head of Legal. Each persona is defined by a detailed prompt structure that specifies strategic priorities, communication style, typical objections and concerns, and triggers for increased or decreased commitment.

These personas are intentionally stylised rather than neutral. Their exaggerated consistency serves a pedagogical purpose: it allows participants to detect patterns, form hypotheses about stakeholder preferences, and test communication strategies in a controlled environment. This approach draws on research suggesting that simplified or amplified representations can enhance learning by making underlying dynamics more visible. Importantly, personas do not reveal their preferences clearly. Participants must infer them through interaction, mirroring real-world stakeholder engagement.

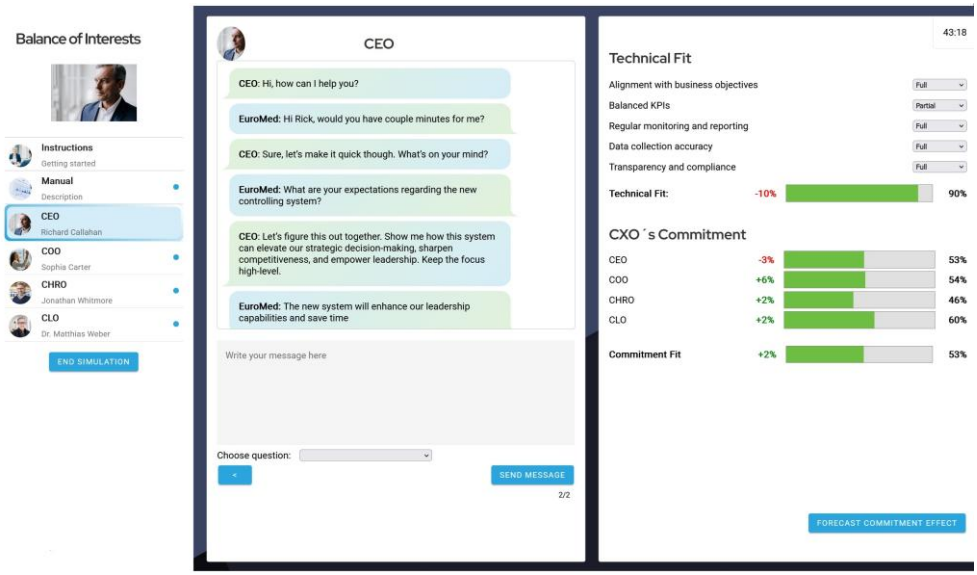


Figure 1: Overview of the Balance of Interest (BOI) simulation interface showing AI-based executive personas, chat-based interaction, and real-time visualisation of technical fit and stakeholder commitment.

Dual feedback logic: persona interaction and analytical evaluation

BOI separates interaction from evaluation through a dual-layer design. On the surface layer, participants engage in natural-language dialogue with the AI personas, who respond in character and maintain conversational coherence.

On a second, hidden layer, each persona is paired with an analytical evaluator that assesses participant statements against predefined commitment criteria. These evaluators assign positive or negative

commitment points based on observable communicative actions (e.g. framing value propositions, addressing concerns, violating role expectations).

This separation allows the simulation to achieve two learning-relevant effects. First, realistic interaction: personas can remain polite, hesitant, or noncommittal even when no commitment is gained. Second, transparent feedback: participants receive immediate, quantitative signals about the effectiveness of their communication strategies. From a learning theory perspective, this design supports rapid feedback cycles, which are critical for skill acquisition (Hattie and Timperley, 2007). It also reduces the common role-play problem in which social niceness may be mistaken for agreement.

Commitment and technical fit as competing performance dimensions

BOI operationalises performance through two independent but interrelated dimensions:

- Commitment is aggregated from individual stakeholder scores and reflects social alignment.
- Technical Fit reflects the functional integrity of the controlling system based on five predefined design features.

Participants can adjust system parameters to increase stakeholder commitment, but doing so may reduce Technical Fit. This intentional tension illustrates a core insight of organisational decision-making: social acceptance and technical excellence rarely align perfectly.

By making this trade-off explicit and quantifiable, the simulation shifts learner attention from "winning" to balancing interests. This design choice aligns with HRM perspectives that emphasise paradox management and integrative thinking as key leadership capabilities (Smith and Lewis, 2011).

Team-based interaction and collective sensemaking

Although BOI can be played individually, it is primarily designed for small teams (three to five participants). Typically, one participant interacts with the simulation interface while others observe, discuss, and propose strategies.

This setup externalises otherwise implicit communication strategies. Participants must articulate their reasoning before acting, exposing their assumptions to group scrutiny. As a result, learning occurs not only through interaction with the AI but also through peer dialogue and collective reflection.

This design resonates with research on team learning and shared cognition, which highlights the importance of making mental models explicit and negotiable (Edmondson, 2012). It also mitigates individual differences in confidence or assertiveness by distributing responsibility across the team.

Role of human facilitation and debriefing

Finally, BOI is deliberately embedded in a broader learning architecture that includes human facilitation. While the simulation provides immediate, data-driven feedback, deeper learning emerges during structured debriefing phases led by an experienced facilitator.

Debriefings typically include benchmarking across teams, discussion of divergent strategies, and analysis of critical interaction moments. This combination of AI-generated feedback and human

sensemaking reflects current best practices in simulation-based learning, where technology augments rather than replaces reflective dialogue (Salas et al., 2009).

Evaluation and Learning Outcomes

Evaluation strategy within a Design Science logic

In line with Design Science Research principles, the evaluation of the Balance of Interest (BOI) artefact follows a formative, exploratory evaluation strategy rather than a summative effectiveness assessment. As emphasised by Hevner et al. (2004) and Gregor and Hevner (2013), early-stage DSR artefacts are not primarily evaluated by outcome metrics alone, but by examining whether they meaningfully address the identified problem and generate valuable insights for both practice and theory.

At the current stage of development, BOI has not yet been subjected to large-scale quantitative learning outcome measurements, systematic interaction log analysis, or longitudinal impact studies. Instead, the current evaluation focuses on:

- observed learner behaviour during simulation use,
- facilitator-based reflections across multiple enactments,
- emergent patterns of engagement, strategy formation, and adaptation, and
- the plausibility and consistency of the artefact's internal logic.

This approach is consistent with prior research on simulation-based learning and serious games, where early evaluations often emphasise engagement, realism, and learning affordances before formal outcome validation (Garris et al., 2002; Salas et al., 2009).

The empirical basis is intentionally modest and consists primarily of facilitator observations and debrief-based reflections rather than a fully standardised dataset. These materials provide useful formative indications, but not validated evidence in the sense of coded interaction logs, survey-based measurements, or comparative experimental data. The observations below should therefore be interpreted as indicative patterns informing artefact refinement and design principles.

Empirical context and sample overview

BOI has been implemented in five facilitated simulation sessions across different educational and professional contexts. These included university-based teaching and workshop settings with heterogeneous participant groups. Each session involved between five and seven teams, with team sizes ranging from three to five participants, resulting in approximately 30 teams and around 100 participants overall.

At the current stage, the sample is characterised only at a broad level. The participant base was heterogeneous in terms of background and experience, but no systematic demographic or professional

profile was collected across all sessions. This limits the extent to which transferability can be assessed and should be considered when interpreting the observations below.

Observed patterns of engagement and motivation

Across all sessions, facilitators noted a high level of learner engagement. Teams remained focused on the simulation for extended periods, often exceeding the planned time slots. Participants repeatedly iterated on their strategies, voluntarily re-engaged with difficult stakeholders, and expressed curiosity about alternative approaches.

From a learning perspective, this sustained engagement is non-trivial. Research on adult learning emphasises that prolonged, self-driven engagement is a necessary—though not sufficient—condition for deep learning (Knowles et al., 2015). In the BOI sessions, this engagement appeared to be supported by the perceived realism of stakeholder interactions, immediate feedback on communicative actions, and a clear but non-trivial performance goal.

Importantly, engagement was not limited to technologically confident participants. Even individuals with limited AI experience actively participated, suggesting that the learning value does not hinge on advanced prompting skills alone.

Commitment dynamics and strategic risk management

A particularly salient observation concerns how teams managed commitment scores during the simulation. While the target threshold of 70 per cent commitment was often reached, teams differed markedly in how far they attempted to optimise beyond this minimum.

Some teams deliberately stabilised around the threshold, prioritising risk avoidance once the success criterion was met. Others pursued higher commitment levels, accepting the risk that aggressive optimisation could lead to point losses. Notably, commitment values above the low 90s were rare, and perfect alignment was never achieved in the observed sessions.

This pattern suggests an important learning dynamic: participants began to reason strategically about risk, diminishing returns, and loss aversion. Rather than blindly maximising scores, teams engaged in explicit trade-off discussions—mirroring real-world managerial decision-making under uncertainty.

From a leadership development perspective, this behaviour is relevant because it indicates that the simulation does not merely reward technical optimisation but can stimulate reflective judgment about when “good enough” may be preferable to excessive ambition (March, 1991).

Differential interaction with AI stakeholders

Another robust pattern across sessions was the pronounced variance in how teams interacted with different AI personas:

- The CEO persona often served as an entry point due to its charismatic and visionary framing.

- The HR persona elicited strongly divergent reactions: some teams quickly established rapport through small talk and relational framing, while others struggled due to task-oriented communication styles.
- The Legal persona consistently challenged teams' ability to manage accountability, responsibility, and reassurance without escalating conflict.

These differences triggered intense intra-team discussions about communication styles, personality fit, and stakeholder-specific strategies. Participants frequently articulated the insight that an approach that works well with one role may fail with another.

Such moments are pedagogically significant because they indicate that learners were not merely reacting to system feedback but were actively constructing differentiated mental models of stakeholder communication—an essential leadership capability (Yukl, 2013).

Second-round effects and meta-strategic learning

In sessions where teams engaged in a second simulation round, facilitators noted a shift in behaviour. Rather than relying primarily on exploratory trial-and-error, teams increasingly adopted explicit strategies, including:

- role allocation within the team (who speaks to whom),
- hypothesis-driven experimentation,
- short feedback loops resembling agile sprint cycles, and
- conscious avoidance of unproductive interaction patterns.

This transition from relatively naïve engagement to more explicit meta-strategic coordination aligns with theories of experiential learning, where reflection transforms experience into transferable knowledge (Kolb, 1984). At the same time, this interpretation remains preliminary and should be tested more systematically in future research.

Discussion and Design Principles

Findings in an HRD context

The observations from BOI suggest that AI-enabled simulations can help address a persistent gap in leadership development: the lack of safe, scalable environments for practising high-stakes communication.

Compared with conventional classroom formats, BOI externalises communication dynamics through quantification and persona consistency while requiring participants to act rather than merely discuss. Any comparison with role plays, case discussions, or real-world practice should be treated cautiously, as this paper does not empirically test relative effectiveness. The study therefore positions AI-based

simulation as a distinct learning modality with strengths in repeatability, immediate feedback, and structured reflection.

A central concern with AI-based learning tools is the risk that they primarily reward technical interaction skills ("prompting") rather than substantive managerial competencies. The BOI observations provide preliminary indications against such a narrow interpretation.

Participants did not simply optimise phrasing. They:

- articulated and compared communication strategies,
- reflected on their own implicit assumptions,
- adapted behaviour to different stakeholder logics, and
- negotiated internally within teams.

From a learning theory perspective, BOI appears to support elements of double-loop learning, where underlying assumptions are questioned and revised.

Design principles for AI-enabled leadership simulations

Based on the artefact design and the recurring formative observations outlined above—particularly the externalisation of team reasoning, the distinction between conversational interaction and analytical scoring, the productive trade-off between commitment and technical fit, and the accessibility of the format across heterogeneous participant groups—the following design principles are proposed:

DP1: Make implicit communication strategies explicit. AI simulations should require learners to articulate and justify their approach before acting, enabling reflection and peer learning.

DP2: Separate interaction realism from evaluative logic. Naturalistic dialogue should be complemented by independent analytical feedback mechanisms to avoid conflating politeness with agreement.

DP3: Embed productive tension rather than optimisation goals. Learning is enhanced when success requires balancing competing objectives rather than maximising a single metric.

DP4: Design for heterogeneity, not expertise. Effective simulations must remain accessible and engaging for learners with diverse backgrounds and skill levels.

DP5: Treat AI as a catalyst for reflection, not an instructor. The primary pedagogical value lies in how AI structures experience and feedback—not in content delivery.

These principles are intended as transferable design knowledge derived from an early-stage DSR project. They are analytically grounded in the artefact and its formative implementations, but they should be further examined and refined in future studies with more systematic data collection.

Contributions

Contributions to human resource management and leadership research

This study contributes to Human Resource Management research by showing how AI-enabled learning environments can support leadership and stakeholder communication competencies that are central to HRM but difficult to train in conventional settings.

First, the paper contributes conceptually by framing high-stakes stakeholder communication not merely as an interpersonal skill, but as a competence embedded in organisational decision-making. By modelling communication as a series of trade-offs between competing interests rather than as persuasion in isolation, Balance of Interest aligns leadership development with contemporary views of organisations as arenas of negotiated order (Mintzberg, 2009; Buchanan and Badham, 2020).

Second, the study contributes to emerging debates on AI in HRM by illustrating how AI does not need to replace human judgment to be valuable. Instead, BOI shows how AI can function as a reflective infrastructure—a system that externalises, stabilises, and makes discussable otherwise tacit social processes. This perspective complements existing work that frames AI either as an efficiency tool or as a decision-maker by highlighting its pedagogical role in competence development.

Third, the paper contributes methodologically by showing how Design Science Research can be used not only to build HRM artefacts, but also to derive theory-informed design knowledge. The proposed design principles translate situated insights into reusable guidance for future HRM interventions, addressing long-standing calls for more design-oriented HRM research (van Aken, 2004; Romme, 2016).

Contributions to simulation-based and experiential learning

Beyond HRM, this paper contributes to research on simulation-based and experiential learning in management education. While prior work has extensively documented the motivational benefits of simulations, BOI highlights a related mechanism: the ability of simulations to foster reflection on implicit assumptions.

By combining conversational freedom with immediate, structured feedback, the simulation creates a low-risk environment for experimenting with communicative strategies, moving beyond role plays with delayed feedback and case-based learning in which action remains hypothetical.

Importantly, the artefact suggests that learning does not primarily occur through correct answers, but through sustained engagement with ambiguity, resistance, and partial failure. This aligns with experiential learning theories that emphasise tension, contradiction, and sensemaking as drivers of development (Kolb, 1984; Cunliffe, 2004).

Limitations and Future Research

This study is subject to several limitations. The evaluation relies primarily on formative observations rather than longitudinal performance measures. The absence of structured interaction logs, standardised outcome measures, and systematically documented participant profiles restricts claims about learning effectiveness and transferability, while facilitator observations remain inherently interpretive. Commitment scores, although systematically derived within the simulation, should therefore be understood as proxy indicators rather than direct measures of learning outcomes. Future research should build on the design principles identified here by incorporating systematic interaction data, standardised participant feedback, longitudinal designs, and comparative studies contrasting AI-based simulations with more traditional learning formats.

Conclusion

This paper introduced Balance of Interest as a novel AI-enabled management simulation for leadership and HR development. By combining stakeholder realism, quantitative feedback, and structured reflection, BOI demonstrates how AI can meaningfully support experiential learning in high-stakes communication contexts. The derived design principles provide a foundation for future research and practice in AI-supported leadership development, while the formative nature of the current evaluation points to the need for more systematic empirical validation.

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NAVIGATING PERFORMANCE MONITORING THROUGH THE NORTH STAR METRIC: A QUALITATIVE ANALYSIS

Di Marzo, Alessandro[1]; Santoro, Gabriele[2]; Bresciani, Stefano[2]

[1]Department of Management "Valter Cantino", University of Turin, Turin, Italy

[2]Department of Management "Valter Cantino", University of Turin, Turin, Italy; School of Business, Gnosis: Mediterranean Institute for Management Science, University of Nicosia, Nicosia, Cyprus

Keywords: North Star Metric, performance metrics, data-driven decision-making, growth hacking, KPI, organizational performance

Introduction

Performance metrics have become central indicators through which organizations define their strategies, coordinate action, and legitimate success (Mandinach et al., 2006; Suresh, 2022). Nowadays, different types of metrics are treated as socio-technical artefacts embedded in routines, incentives, and infrastructures that shape what companies pursue (HBR, 2019; Chen et al., 2017). Within this broader landscape, the concept of North Star Metric (NSM) refers to a singular, top-line indicator to best describe the core value delivered to customers and to concentrate organisational attention and experimentation on a shared direction within the company (Ellis, 2017; Rachitsky, 2021).

This expression tracks his origins from the growth hacking literature (Ellis, 2017): just like Polaris, the star who acted as a guiding light for sailors during the nights, the NSM intends to guide managers to achieve growth (Hanselman, 2005; Ponomarev, 2021).

The present literature has approached this topic through numerous recent contributions published on websites and blogs specialised in startups, innovation, entrepreneurship and growth hacking, authored by practitioners and enthusiasts who have actively explored the concept, also trying to study its use and impact within specific sectors (D'Auria, 2019; Dalrymple, 2021; Ellis, 2017; Garr, 2021; Stuart, 2025; Ponomarev, 2021, Croak et al., 2019).

However, to date there is a lack of scientific evidence on whether and how organizations adopt one single metric (like the NSM), how it is defined, and how it shapes the overall

strategy and decision making (Cristofaro et al., 2025; Mandinach et al., 2006).

Purpose, Aim and Objectives

For these reasons, the goal of this paper is to investigate how organizations develop andmanage DDDM through NSM definition and adoption, and how NSM influences the strategic approach. Therefore, we aim to address the following research question: *How are decision-making processes in organizations affected by the adoption of a North Star Metric?*

Methodology

Methodologically, the study employs open essays and a set of interviews addressed tomanagers in product, growth, analytics, and data management roles. The aim is to clarify the patterns in NSM awareness, adoption, and perceived usefulness across roles, company sizes, and maturity stages, building on previous work on KPI use and performance systems (HBR,2019; Suresh, 2022). Open-ended questions invite respondents to describe what NSM means in their organization, how it is selected and revised, and to recount concrete episodes in which NSM supported or distorted decision making.

Expected Results, Originality

By conducting our research, we expect to obtain valuable insights about how managers conceptually identify and distinguish the NSM compared to other performance indicators, also unveiling the conditions under which its adoption takes place.

We also aim to identify the patterns of how the NSM fosters or hinders cross-functional alignment and to show when NSM effectively supports firms' decisions without acting as a fallacious indicator. Taken together, these results should strongly contribute to refining the theoretical understanding of NSMs and provide actionable and helpful guidance for managers and practitioners to design/build their metric-based performance management systems.

Limitations and Implications

Still, this study may be subject to certain limitations: for instance, our sample may not be fully representative in terms of size, industry representation and/or geographical location; this could constrain the generalizability of our findings.

In spite of these limitations, this study is expected to lay the groundwork for a cleaner conceptualization of the NSM and for future research on its importance within data-driven

firms.

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DYNAMIC CAPABILITIES AND ENTREPRENEURSHIP

Hummel, Sarah

European Institute of Management, Valletta, Malta

Keywords: Dynamic capabilities, entrepreneurship, micro-foundations, multinational enterprises, international performance, human capital, social capital, cognition.

Introduction

Dynamic capabilities explain how firms adapt and innovate in complex environments (Teece et al., 1997), yet a gap persists between theory and practice, particularly regarding how they enable entrepreneurship in multinational enterprises (MNEs) (Augier and Teece, 2007; Zahra et al., 2022).

Purpose, Aim and Objectives

This review develops a holistic interpretive framework integrating dynamic capabilities, entrepreneurship, and international business scholarship (Foss and Mazzelli, 2025). Two questions guide the study: How are micro-foundations of entrepreneurial dynamic capabilities conceptualised in recent research? How do they affect entrepreneurial outcomes in MNEs and subsidiaries?

Literature Review and Theoretical Framework

Teece et al. (1997) and Zahra et al. (2006) established the sensing-seizing-transforming architecture; Augier and Teece (2007) and Zahra et al. (2022) extended it to MNE contexts. Magni et al. (2023) and Scuotto et al. (2022) link micro-foundational capabilities to internationalisation and digital transformation. Existing studies nonetheless isolate one dimension — experience, networks, or cognition — rather than examining their joint operation (Barney and Felin, 2013; Hodgson, 2012).

Methodology and Methods

A narrative literature review covers peer-reviewed English-language articles (2020–2025), supplemented by seminal pre-2020 works as the theoretical baseline. Quantitative, qualitative, and mixed-methods studies are included.

Main Findings and Contribution

Entrepreneurial dynamic capabilities are frequently modelled as mechanisms converting leadership into innovation and performance (Kanda et al., 2025; Merín-Rodrígáñez et al.,

2025). Micro-foundational treatments remain fragmented (Durán and Aguado, 2022), and the mechanisms by which managers activate capabilities under geopolitical volatility and digital disruption are underspecified (Zahra et al., 2022).

Originality and Value

The study proposes an integrative micro-foundational framework bridging entrepreneurial dynamic capabilities and MNE management, translating 2020–2025 findings into actionable guidance for executives navigating cross-border entrepreneurship (Magni et al., 2023; Zahra et al., 2022).

Research Limitations

The 2020–2025 focus may not capture the full theoretical trajectory of dynamic capabilities. Database selection and reliance on English-language sources introduce additional boundary conditions.

Theoretical and Practical Applications and Implications

The integrative framework jointly accounts for human capital, social capital, and cognition as drivers of entrepreneurial outcomes in MNEs (Foss and Mazzelli, 2025; Pitelis et al., 2024), and guides managers in designing capability-building routines robust to environmental turbulence (Zahra et al., 2022).

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GLOBAL STRATEGY AND INNOVATION FOR BUSINESS EXCELLENCE IN CHALLENGING TIMES: THE EVTOL INDUSTRY

Grace Chew
G Gianna Consultancy Pte Ltd

Keywords: Ecosystem Integration, eVTOL, Innovation Leadership, Sustainable Environment, Strategic Alignment, Urban Air Mobility

Abstract

The electric Vertical Take-Off and Landing (eVTOL) industry is emerging as a transformative force in urban air mobility (UAM), offering the potential to reduce congestion, improve sustainability, and reshape future transportation systems. Despite significant technological advances and increasing global investment, the industry continues to face substantial challenges related to regulatory uncertainty, infrastructure readiness, technological limitations, and market adoption. Existing research on eVTOL has primarily focused on engineering feasibility, sustainability, and regulatory development, with limited attention given to how strategic management and innovation collectively support business excellence in turbulent environments. This study addresses this gap by examining how global strategy and innovation enable scalable commercialization and long-term competitiveness within the eVTOL sector. Drawing on strategic management theory, disruptive innovation theory, dynamic capability theory, and ecosystem theory, the paper proposes an integrated framework based on three interrelated pillars: strategic alignment, innovation leadership, and ecosystem integration. A qualitative multi-case study methodology is employed to examine the strategic approaches of Joby Aviation, EHang, and Volocopter.

The findings demonstrate that successful commercialization depends not only on technological innovation but also on the ability of firms to align regulatory adaptation, ecosystem collaboration, and phased deployment strategies. The study contributes to the literature by integrating global strategy and innovation perspectives within the emerging urban air mobility context and by providing a resilience-oriented framework for navigating uncertainty and industry disruption. The paper also offers managerial and policy implications for industry leaders, regulators, and infrastructure stakeholders seeking to accelerate sustainable urban air mobility development.

Introduction

The global transportation industry is undergoing a profound transformation driven by sustainability imperatives, rapid urbanization, and advances in digital and electrification technologies. Within this transition, eVTOL industry has emerged as a promising component of UAM, offering the potential to reduce urban congestion, improve connectivity, and support low-carbon transportation systems.

Despite increasing investment and technological advancement, the commercialization of eVTOL technologies remains highly uncertain and complex. Key challenges include stringent certification requirements, technological limitations in battery performance and autonomous systems, infrastructure constraints related to vertiports and charging systems, and concerns surrounding public acceptance and international regulatory harmonization (Hu et al., 2024; Schweiger et al., 2022; Mou, 2020)

Existing research on eVTOL and UAM has primarily focused on engineering feasibility, regulatory development, sustainability potential, and operational design (Cohen & Shaheen, 2021; Straubinger et al., 2020). While these studies provide valuable technological and policy insights, limited attention has been given to how global strategy and innovation management collectively shape business excellence in turbulent and uncertain industry environments. In particular, the literature lacks an integrated strategic perspective that connects innovation leadership, ecosystem collaboration, and adaptive global strategies within the emerging eVTOL ecosystem (Fu et al., 2019; Rothfeld et al., 2021). As a result, current scholarship remains fragmented in explaining how firms can successfully scale operations, manage uncertainty, and achieve sustainable competitive advantage in the UAM industry (Bauranov & Rakas, 2021).

Purpose and objectives

This study addresses this research gap by proposing an integrated framework for business excellence in the eVTOL industry based on three interrelated pillars: strategic alignment, innovation leadership, and ecosystem integration. Drawing on strategic management theory, disruptive innovation theory, dynamic capability theory, and ecosystem theory, the study examines how firms can align technological innovation with regulatory environments and collaborative ecosystems to enable scalable commercialization.

The study is guided by the following research questions:

1. How do eVTOL firms align global strategy and innovation to achieve business excellence in challenging times?

2. What roles do technological innovation, regulatory adaptation, and ecosystem collaboration play in enabling scalable commercialization?
3. How do leading eVTOL firms differ in their approaches to certification, infrastructure development, and market deployment?
4. How does the proposed integrated framework advance understanding of sustainable UAM ecosystems?

The remainder of the paper is structured as follows. The next section reviews the literature on disruptive innovation in aviation, sustainable transportation systems, innovation ecosystems, and global strategy frameworks relevant to the eVTOL industry. This is followed by an overview of the industry landscape and key challenges. The paper then introduces the proposed integrated framework and presents a qualitative multi-case analysis of leading eVTOL firms. Finally, the discussion and conclusion highlight the theoretical contributions, managerial implications, limitations, and directions for future research.

Literature Review

Disruptive Innovation in Aviation

The eVTOL industry is transforming urban and regional air transport by enabling decentralized, on-demand mobility through electrically powered aircraft integrated with digital platforms. Unlike traditional aviation systems that rely on centralized airports and fixed routes, eVTOL systems support flexible, network-based transportation aligned with smart city and multimodal mobility initiatives. This transformation reflects Christensen's (1997) disruptive innovation theory, whereby emerging technologies reshape existing industry structures over time. In the eVTOL context, innovation extends beyond incremental efficiency improvements to a broader reconfiguration of mobility systems through technologies such as artificial intelligence, real-time data analytics, and Unmanned Aircraft System Traffic Management (UTM), enabling dynamic routing, decentralized operations, and scalable urban air mobility services.

Sustainable Transportation Systems

Sustainable transportation systems are increasingly important in global efforts to reduce climate change, urban congestion, and environmental impacts. Electrification and decarbonization have become central priorities due to the significant contribution of the transport sector to global greenhouse gas emissions (International Energy Agency, 2022). In the aviation sector, innovations such as electric propulsion and hybrid systems are supporting the transition toward cleaner mobility solutions. In this context, eVTOL aircraft offer potential benefits including

reduced emissions, lower noise pollution, and improved energy efficiency compared to conventional aircraft (National Aeronautics and Space Administration, 2020).

Sustainable UAM also depends on the integration of renewable energy, smart infrastructure, and digital technologies. Renewable energy-powered vertiports and intelligent traffic management systems can support low-carbon mobility ecosystems and align with global sustainability initiatives such as the Paris Agreement and net-zero emission targets (United Nations Framework Convention on Climate Change, 2015).

Innovation Ecosystems

Innovation ecosystems are critical in high-technology industries where value creation depends on collaboration among multiple stakeholders. Unlike traditional linear value chains, innovation ecosystems involve dynamic and interdependent networks of firms, regulators, infrastructure providers, and end users that enable value co-creation through knowledge sharing and collaborative innovation (Moore, 1993).

In the eVTOL industry, these ecosystems include manufacturers, regulatory agencies such as the FAA and EASA, infrastructure developers, energy providers, and digital platform operators. Collaboration among these stakeholders is essential for addressing challenges related to certification, infrastructure deployment, airspace management, and market adoption. Public–private partnerships and open innovation models support resource sharing, risk reduction, and faster commercialization (Chesbrough, 2003). However, ecosystem complexity also creates challenges related to coordination, regulatory fragmentation, and technological interoperability, requiring stronger strategic alignment and standardized frameworks.

The proposed framework is therefore grounded in strategic management, innovation, and ecosystem theories to explain how firms operating in uncertain and technology-intensive environments can achieve sustainable competitive advantage.

Global Strategy Framework

The strategic alignment dimension is grounded in the integration–responsiveness framework (Bartlett and Ghoshal, 1989) and dynamic capability theory (Teece, 1997). These perspectives emphasize the need for firms to balance global scalability with local adaptation while responding to rapidly evolving regulatory and technological conditions. In the eVTOL industry, firms must simultaneously achieve operational efficiency and comply with region-specific regulations and infrastructure requirements.

The innovation leadership pillar is informed by disruptive innovation theory (Christensen, 1997) and open innovation theory (Chesbrough, 2003). eVTOL technologies represent a disruptive transformation of conventional transportation by enabling decentralized and sustainable

mobility solutions. Open innovation further highlights the importance of collaboration and knowledge sharing among aerospace firms, regulators, infrastructure providers, and technology developers to accelerate innovation and reduce development risks.

The ecosystem integration dimension draws on business ecosystem theory (Moore, 1993), which emphasizes interdependence and collaborative value creation among multiple stakeholders. In the eVTOL industry, ecosystem integration is essential because commercialization depends on coordination among regulators, infrastructure developers, energy providers, and digital platform operators.

By integrating these theoretical perspectives, the study develops a holistic framework explaining how strategic alignment, innovation leadership, and ecosystem collaboration collectively support business excellence and scalable commercialization in the eVTOL industry.

Industry Overview: The Evtol Landscape

The eVTOL industry is projected to grow significantly over the next decade, driven by urban congestion challenges**,** sustainability goals and advances in battery technology. The estimate potential for UAM is forecasted to reach USD137.1B by 2035 (Fig 1: Grand View Research, 2025). Therefore, in the recent years, there are many players have been progressed significantly in the development of VTOL aircraft for UAM market as the air travel alternative mode of transport.



Fig 1: Market Size of Advanced Air Mobility Market 2021-2035. (Source:Grand View Research)

Key Industry Challenges

Regulatory Complexity

Regulatory complexity represents one of the most significant barriers to the commercialization and scalability of the eVTOL industry. Certification processes governed by authorities such as the FAA and EASA are inherently rigorous, reflecting the high safety standards required in aviation. While these frameworks are essential for ensuring airworthiness and operational safety,

they introduce substantial time, cost, and uncertainty into the development lifecycle of eVTOL aircraft. Fig. 2 illustrates the evolution of eVTOL certification, highlighting the progression from early prototype development to regulatory framework establishment and anticipated commercial certification (European Union Aviation Safety Agency, 2022).

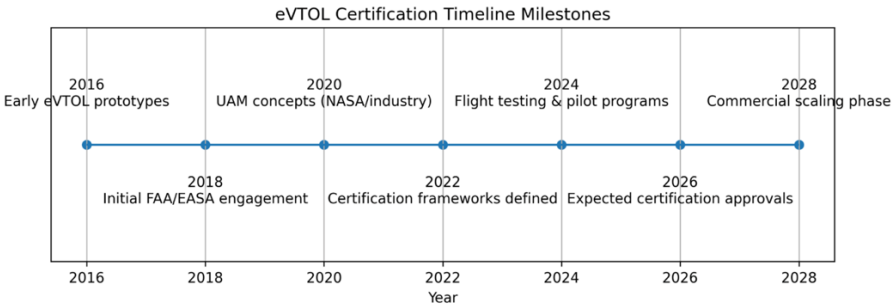


Fig. 2: Timeline of key certification milestones in the eVTOL industry.(Source:European Union Aviation Safety Agency, 2022)

Technological Constraints

Technological constraints remain a critical barrier to the scalability and commercialization of the eVTOL industry, particularly in relation to battery energy density, safety systems, and system integration. Unlike conventional aviation, which relies on high energy-density liquid fuels, eVTOL aircraft depend primarily on lithium-based batteries, which currently exhibit significantly lower energy density. This limitation directly impacts aircraft range, payload capacity, and operational efficiency, constraining the viability of long-distance or high-frequency operations (National Aeronautics and Space Administration, 2020).

Safety systems present an additional layer of technological complexity, as eVTOL aircraft must meet stringent aviation safety standards while incorporating novel architectures such as distributed electric propulsion. Redundancy in propulsion systems, fault-tolerant flight control algorithms, and real-time monitoring are essential to ensure safe operations. However, these requirements increase system weight, energy consumption, and design complexity, further constraining performance capabilities.

Infrastructure Gaps

Infrastructure gaps remain a major constraint on the large-scale deployment of eVTOL operations, particularly in relation to vertiports, charging systems, and integration with existing urban transport networks. Unlike conventional aviation, eVTOL systems require distributed vertiport networks within urban environments to support efficient point-to-point mobility. However, vertiport development involves complex challenges related to site selection, airspace integration, safety requirements, and regulatory compliance. Urban density and zoning

restrictions further complicate deployment, while the lack of standardized planning frameworks continues to limit scalability (European Union Aviation Safety Agency, 2022).

Charging infrastructure also presents significant challenges due to the high energy demands of eVTOL aircraft. Rapid charging requirements place pressure on existing electrical grids and require coordination among energy providers, infrastructure developers, and operators. In addition, infrastructure systems must be integrated with emerging UTM frameworks to support safe and efficient operations (National Aeronautics and Space Administration, 2020).

Public acceptance is another critical factor influencing infrastructure deployment. Noise concerns, visual impact, and community engagement must be addressed to support widespread urban integration (Clothier et al., 2015). Although companies such as Volocopter and Skyports have begun piloting vertiport concepts, large-scale implementation remains at an early stage and will require coordinated investment and cross-sector collaboration.

Innovation Drivers

Engineering innovation is a key driver of advancement in the eVTOL industry, supporting the development of efficient, safe, and scalable urban air mobility solutions. Major innovations include distributed electric propulsion (DEP), lightweight materials, and autonomous navigation systems.

DEP systems use multiple electric motors and propellers distributed across the airframe to improve aerodynamic efficiency, flight control, and safety through increased redundancy. Lightweight composite materials, such as carbon fiber-reinforced polymers, help offset battery weight limitations while improving payload capacity, energy efficiency, and operational performance (International Energy Agency, 2023).

Autonomous navigation systems are also critical for scalable eVTOL operations, particularly in dense urban environments. Technologies such as artificial intelligence, LiDAR, computer vision, and advanced avionics enable obstacle detection, route optimization, and collision avoidance. UTM systems further improves airspace coordination and operational efficiency (Federal Aviation Administration, 2020).

Digital Innovation

Digital innovation plays a critical role in improving the scalability, efficiency, and safety of eVTOL operations through the integration of advanced data-driven technologies. Key innovations include artificial intelligence (AI)-based traffic management and predictive maintenance systems, which support the management of complex and high-density urban air mobility operations. UTM systems enable the coordination of multiple aerial vehicles through dynamic route optimization, collision avoidance, and congestion management using real-time

data from sensors, weather systems, and communication networks. Organizations such as NASA and the FAA are actively developing UTM frameworks to support scalable urban air mobility operations (National Aeronautics and Space Administration, 2020).

Predictive maintenance is another important application of digital innovation in the eVTOL industry. By using real-time sensor data, historical records, and machine learning algorithms, predictive maintenance helps identify potential system failures before they occur. This approach improves operational reliability, reduces downtime, and lowers maintenance costs, particularly for critical systems such as batteries, propulsion units, and avionics.

Business Model Innovation

Business model innovation is an important driver of value creation and commercialization in the eVTOL industry, complementing technological and digital advancements. As urban air mobility evolves, traditional aviation models are being transformed through Mobility-as-a-Service (MaaS) and platform-based ecosystems that emphasize accessibility, integration, and user-centric mobility services (Hensher, 2017).

MaaS shifts transportation from asset ownership to service-based consumption by integrating multiple transport modes into a unified digital platform (Jari Salo et al., 2016). In the eVTOL context, MaaS enables seamless multimodal travel by combining air mobility with ride-hailing, public transit, and micromobility services through integrated booking and payment systems (Smith, Sochor and Karlsson, 2018). Companies such as Uber have explored integrating urban air mobility into MaaS platforms to support scalable, on-demand transportation services (Holden and Goel, 2016). Platform ecosystems also play a transformative role in the eVTOL industry by connecting manufacturers, operators and infrastructure providers.

Proposed Integrated Framework

This study develops an integrated framework for business excellence in the eVTOL industry by addressing the fragmented and technology-focused nature of existing research. While prior studies have primarily examined engineering feasibility, regulation, sustainability, and consumer adoption, limited attention has been given to how firms integrate innovation, regulatory adaptation, and ecosystem coordination to achieve scalable commercialisation and sustainable competitive advantage.

The proposed framework integrates three interrelated dimensions—strategic alignment, innovation leadership, and ecosystem integration—into a unified perspective. Drawing on the integration–responsiveness framework, dynamic capability theory, disruptive innovation theory, and ecosystem theory, the framework views technological innovation, regulatory compliance,

and infrastructure development as interconnected capabilities that must be managed simultaneously in uncertain environments. It further emphasises ecosystem collaboration and organisational resilience as critical enablers of commercial success.

Research Design

This study adopts a qualitative multi-case study approach to examine how leading eVTOL firms navigate commercialisation challenges and strategic uncertainty. A multi-case design is appropriate because the eVTOL industry is a rapidly evolving phenomenon where contextual factors are important (Yin, 2014).

Case Selection, Data Sources and Analysis

Three firms were selected for comparative analysis: Joby Aviation (United States), EHang (China), and Volocopter (Germany). The cases were chosen based on industry leadership, diversity of strategic approaches, availability of secondary data, and representation of different regulatory environments. Together, they provide contrasting pathways for eVTOL commercialisation.

Secondary data were collected from company reports, investor presentations, FAA and EASA publications, academic journals, industry reports, conference presentations, public interviews, and corporate press releases. The study employed thematic comparative analysis, coding data according to strategic alignment, innovation leadership, and ecosystem integration. Within-case and cross-case analyses were conducted to identify common patterns and strategic differences, while data triangulation enhanced reliability and validity.

Joby Aviation: Certification Strategy and Ecosystem Partnerships

Joby Aviation is widely recognized as a leading pioneer in the eVTOL industry due to its advanced certification progress, vertically integrated business model, and strategic partnerships. The company provides a strong example of how firms can navigate regulatory complexity while developing scalable urban air mobility operations.

A central component of Joby's strategy is its close collaboration with the FAA to achieve Part 23 airworthiness certification for its eVTOL aircraft. By working proactively with regulators to adapt certification standards for distributed electric propulsion and electric power systems, Joby has progressed through several certification stages, positioning itself among the first firms likely to achieve commercial approval. This regulatory alignment reduces uncertainty and strengthens first-mover advantage.

Joby's aircraft incorporates distributed electric propulsion technology, enabling vertical take-off and landing with lower noise levels, enhanced redundancy, and improved operational safety. The company has also conducted extensive flight testing to demonstrate operational reliability

and commercial readiness. Its vertically integrated approach, which includes aircraft design, manufacturing, operations, and maintenance, supports greater quality control and operational efficiency.

Another key strength is Joby's ecosystem partnership strategy, particularly its collaboration with Delta Air Lines. This partnership supports integration between eVTOL services and existing airline networks, enabling seamless airport-to-city transportation while enhancing customer access, infrastructure integration, and market credibility (Joby Aviation, 2023).

Overall, the Joby Aviation case highlights several critical success factors in the eVTOL industry, including regulatory alignment, ecosystem collaboration, vertical integration, and phased deployment strategies focused on high-demand urban routes. The company strongly reflects the three pillars of the proposed framework: strategic alignment, innovation leadership, and ecosystem integration.

EHang: Advancing Autonomous Aerial Systems and Early Commercial Deployment

EHang represents a distinctive approach within the eVTOL industry through its strong emphasis on fully autonomous flight systems, early-stage commercialization, and alignment with China's domestic regulatory environment. Unlike many Western competitors that prioritize piloted aircraft and gradual certification pathways, EHang positions autonomy as a key competitive differentiator.

The company's primary innovation is its autonomous aerial vehicles (AAVs), particularly the EH216 series, which operate without onboard pilots. These aircraft integrate advanced sensors, communication systems, and centralized control platforms to support autonomous navigation, route planning, and fleet coordination. While this approach supports scalability and operational efficiency, it also introduces challenges related to safety assurance and system reliability in urban environments. EHang has benefited from China's relatively flexible and innovation-oriented regulatory environment, enabling faster testing and deployment compared to more stringent Western regulatory systems. The company has conducted pilot projects in urban mobility, tourism, emergency response, and medical transport, using a "deploy-to-learn" strategy where operational experience supports iterative system improvement and regulatory development (EHang, 2018).

EHang's business model emphasizes centralized fleet operations, smart city integration, and partnerships with municipal governments. This platform-based approach enables efficient fleet management, route optimization, and ecosystem coordination through digital infrastructure.

The EHang case highlights several important success factors in the eVTOL industry, including autonomous innovation, adaptive regulatory alignment, real-world deployment learning, and

platform ecosystem integration. The company reflects the three pillars of the proposed framework through strategic alignment, innovation leadership, and ecosystem integration.

Volocopter: Urban Deployment and Infrastructure-Centric Strategy

Volocopter represents a regulation-first and infrastructure-driven approach to the eVTOL industry, with a strong focus on urban deployment, safety certification, and integrated mobility ecosystems. Unlike competitors emphasizing aircraft performance or autonomy, Volocopter positions itself as a holistic UAM solution provider by combining aircraft development with infrastructure and operational services.

The company's strategy targets dense urban environments through short-distance, high-frequency routes such as airport transfers and intra-city mobility. Its flagship aircraft, the VoloCity, is designed for low-noise and short-range urban operations, particularly in cities with strong regulatory support and infrastructure readiness such as Paris and Singapore.

A defining feature of Volocopter's approach is its emphasis on vertiport infrastructure. Through partnerships with companies such as Skyports, Volocopter develops modular vertiport systems that support take-off, landing, charging, and passenger handling while integrating with existing transport networks. This reflects the company's view that successful eVTOL deployment depends on both aircraft technology and supporting infrastructure ecosystems.

Volocopter also maintains close collaboration with the EASA, following a certification-first strategy that prioritizes safety, regulatory compliance, and public trust before large-scale commercialization. The company actively engages in public–private partnerships with governments, regulators, and infrastructure providers to support urban mobility planning and pilot projects, including demonstrations linked to the Paris Olympics.

Its service-oriented business model aligns with Mobility-as-a-Service (MaaS) principles by integrating aircraft, infrastructure, and operational services into a unified urban mobility solution (Volocopter, 2021). The Volocopter case highlights several important success factors in the eVTOL industry, including infrastructure readiness, regulatory alignment, urban-focused deployment, and ecosystem collaboration. The company strongly reflects the three pillars of the proposed framework: strategic alignment, innovation leadership, and ecosystem integration.

Findings and Discussion

The findings demonstrate that successful eVTOL commercialization depends on the interaction of technological innovation, regulatory adaptation, and ecosystem coordination. The comparative analysis shows that firms pursue different strategic pathways depending on regulatory environments, infrastructure readiness, and commercialization priorities. The study

extends existing literature by demonstrating that technological innovation alone is insufficient for achieving business excellence. Instead, competitive advantage emerges through the integration of strategic alignment, innovation leadership, and ecosystem collaboration. The findings also support dynamic capability theory by illustrating how firms continuously adapt organizational strategies and ecosystem relationships in response to uncertainty and evolving market conditions. Furthermore, the study advances ecosystem theory by demonstrating how collaborative stakeholder networks influence scalability and commercialization outcomes within emerging mobility systems.

Conclusion

The eVTOL industry represents a transformative advancement in urban mobility, integrating aerospace engineering, electrification, digital technologies, and sustainable transportation systems. As cities face increasing challenges related to congestion, sustainability, and mobility efficiency, eVTOL technologies offer significant potential to reshape future transportation ecosystems. However, this study demonstrates that technological innovation alone is insufficient for successful commercialisation and long-term viability.

This paper proposes an integrated framework for business excellence based on three interconnected pillars: strategic alignment, innovation leadership, and ecosystem integration. The findings indicate that successful commercialisation depends on aligning technological capabilities with regulatory requirements, infrastructure readiness, customer acceptance, and stakeholder collaboration. The comparative analysis of Joby Aviation, EHang, and Volocopter further shows that different strategic pathways emerge under varying regulatory environments, market priorities, and ecosystem structures.

The study contributes to the literature by extending strategic management and innovation theories to the emerging UAM and eVTOL context, developing a resilience-oriented framework, and providing comparative insights into how firms navigate uncertainty, regulatory complexity, and technological disruption to achieve sustainable competitive advantage. The findings suggest that future industry leaders will be distinguished not only by technological capabilities but also by their ability to build partnerships, engage regulators, and orchestrate complex ecosystems.

From a managerial perspective, firms should adopt phased deployment strategies, strengthen ecosystem partnerships, and integrate infrastructure planning with technological development. Collaboration among governments, regulators, infrastructure providers, and digital platform operators will be critical to accelerating certification, improving operational readiness, and

building public trust. Emerging technologies such as artificial intelligence, predictive maintenance, and digital traffic management systems will further support safe and scalable UAM operations.

Despite its contributions, this study is limited by its reliance on qualitative secondary data, the rapidly evolving nature of the industry, and its focus on leading eVTOL firms. Future research should incorporate primary data, longitudinal studies, and quantitative analysis to enhance generalisability. Further investigation into battery technologies, autonomous systems, vertiport optimisation, multimodal integration, environmental impacts, and ecosystem governance would provide deeper insights into the development of sustainable urban air mobility. Ultimately, firms that successfully combine strategic adaptability, innovation leadership, and ecosystem collaboration will be best positioned to shape the future of urban transportation.

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FROM PRODUCT-MARKET FIT TO PRODUCT-MISSION FIT: RETHINKING INNOVATION STRATEGY FOR NICHE MEDIA PLATFORMS

Morgan, Sesi

Department of Communications, School of Humanities and Social Sciences, University of Nicosia, Nicosia, Cyprus

Keywords: Product-Market Fit, Product-Mission Fit, Business Model Innovation, Niche Media Platforms, Mission-Driven Ventures, Institutional Legitimacy, Autoethnography, Performativity.

Introduction

Product-Market Fit (PMF) is central to innovation and entrepreneurship research (Ries, 2011; Blank, 2013). It assumes that venture sustainability emerges when a product delivers sufficient functional utility to a paying market. However, its applicability to mission-driven niche media platforms, where users engage for reasons tied to moral commitments and identity rather than transactional utility (Ebrahim, Battilana and Mair, 2014) is under examined.

Purpose, Aim and Objectives

This paper examines how PMF assumptions misalign with stakeholder logic in mission-driven niche media platforms, and proposes Product-Mission Fit as an alternative innovation strategy. The objectives are to identify interpretive tensions raised by subscription monetisation, to trace how organisational form and communicative signalling reconfigure value exchange and to advance Product-Mission Fit as a strategy addressing sustainability in non-commercial platforms.

Literature Review and Theoretical Framework

The study intersects with innovation theory, media strategy and scholarship on institutional legitimacy. Building on critiques of universalised PMF (Shepherd and Gruber, 2021), it draws on research emphasising niche positioning without reliance on scale (Küng, 2017), business model innovation in young ventures (Snihur and Zott, 2020), and business model innovation in response to grand challenges (Bocken et al., 2025). It also engages performative accounts of

legitimacy (Callon, 2006). Together, these frame innovation strategy as a process in which organisational forms shape appropriate exchange.

Methodology and Methods

The paper draws on a longitudinal analytic autoethnography (Anderson, 2006) of Oriire, an early-stage niche media platform. Grounded in constructivist principles, analytic autoethnography was selected over evocative for its theoretical engagement alongside founder reflexivity. The single case design is justified by Oriire's analytical fit as a mission-driven platform navigating monetisation transitions. Reflexive journals and user feedback help foreground interpretive tensions while product decision logs, monetisation experiments and platform analytics document organisational and communicative reconfiguration. Across these sources, inductive constant comparative analysis traced how monetisation and organisational shifts aligned with observable shifts in user response.

Findings and Contribution

The analysis identifies a pattern in which strong mission alignment and sustained engagement did not translate into willingness to pay for content subscriptions. Users framed the platform's output as a shared good and expressed discomfort with commodified access. This dynamic is interpreted as a free-rider problem (Cullity, 2025), reflecting misalignment between PMF oriented monetisation and users' moral interpretation of the platform. The platform pivoted towards a hybrid non-profit configuration centred on membership, donations and grants. The paper introduces Product-Mission Fit as a strategy positioning donors and grant makers as a distinct stakeholder market valuing communicated legitimacy and mission credibility.

Originality and Value

The originality lies in proposing Product-Mission Fit as a conceptual extension to PMF, in reframing hybrid non-profit configurations as strategic innovation rather than post-commercial concession as well as in the longitudinal autoethnographic design.

Research Limitations

The single-case autoethnographic design limits statistical generalisability and reflects the interpretive position of a founder-researcher. The study offers analytically grounded insights intended to inform comparative research, rather than universal claims.

Theoretical and Practical Applications and Implications

Theoretically, the paper extends PMF debates into mission-driven niche platform contexts and connects business model innovation with performative accounts of legitimacy. Practically, the findings offer founders and funders a conceptual lens for evaluating sustainability where price-utility is not the primary driver of stakeholder commitment.

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Credibility Over Reach: Understanding the Distinct Logics of B2B and B2C Influencer Marketing

Correia, Ricardo[1]; Meneses, Raquel[2]; Fontes, Ruta[3]
1 UNIAG, Instituto Politécnico de Bragança, Bragança, Portugal
2 Faculty of Economics, University of Porto, Porto, Portugal
3 GOVCOPP, University of Aveiro, Aveiro, Portugal

Keywords: Influencer marketing, business-to-business marketing, thought leadership, social media strategy, relationship marketing, network influence

Abstract

Influencer marketing has become a central feature of contemporary marketing practice, yet scholarly understanding remains heavily weighted toward business-to-consumer (B2C) contexts. This paper addresses this imbalance through a systematic comparative analysis of B2C and business-to-business (B2B) influencer marketing. Drawing on a structured synthesis of prior research and illustrative case evidence, the study evaluates the applicability of dominant B2C influencer marketing insights to B2B settings, identifies core distinctions between B2C and B2B influencer strategies, objectives, and outcomes, and reviews the theoretical foundations underpinning each domain. The analysis shows that B2B influencer marketing operates through different influence mechanisms than B2C influencer marketing, with expertise-based credibility, knowledge transfer, and long-term relationship development outweighing visibility-driven reach and emotional resonance. These differences imply that established B2C frameworks require substantial adaptation and, in several areas, dedicated conceptualization for B2B contexts. The paper contributes by clarifying the boundary conditions of existing influencer marketing theory, highlighting priorities for future research, and offering actionable managerial guidance for influencer selection, collaboration design, content development, platform strategy, and performance measurement in B2B markets.

Introduction

Influencer marketing has emerged as one of the most significant developments in contemporary marketing practice, reshaping brand–audience communication in the digital era. Grounded in word-of-mouth marketing principles (Keller and Fay, 2012), it leverages the credibility and persuasive capacity of individuals who hold authority within specific communities. In business-to-consumer (B2C) markets, influencer marketing has become mainstream through platforms such as Instagram, TikTok, and YouTube, where influencers shape outcomes through authentic, relatable, and emotionally resonant content (Djafarova and Rushworth, 2017; De Veirman et al., 2017). These individuals function as cultural intermediaries,

connecting brands and consumers in ways that traditional advertising often fails to achieve (Khamis et al., 2016).

In contrast, the application of influencer marketing within business-to-business (B2B) contexts remains at an early stage of development, despite its growing strategic relevance. B2B markets exhibit distinct characteristics, including complex purchasing processes, extended sales cycles, and multiple decision-makers who base selections on rational, data-driven evaluation rather than emotional responses (Homburg et al., 2014). Here, influencer value derives less from visibility and more from credible expertise and thought leadership that reduces uncertainty and supports organizational decision-making (Crisafulli et al., 2022; Sundermann and Raabe, 2019). B2B influencers typically include consultants, academics, senior executives, or recognized subject matter experts who occupy central positions within professional networks (Huotari et al., 2015).

The accelerating digitalization of B2B markets has intensified organizational interest in influencer marketing. Major technology firms, including IBM, Cisco, and SAP, have incorporated influencer collaborations into their marketing approaches by engaging recognized experts to communicate complex value propositions, produce thought leadership content, and generate engagement at industry events. These implementations illustrate how influencer marketing, when adapted to B2B contexts, can serve as a strategic mechanism for building brand authority, establishing trust, and managing long-term stakeholder relationships.

Despite these developments, significant research and practice gaps persist. Existing literature overwhelmingly concentrates on B2C contexts, where visibility, virality, and emotional resonance represent primary influence mechanisms (Freberg et al., 2011). The limited research examining B2B influencers (e.g., Vrontis et al., 2021; Crisafulli et al., 2022) indicates that influence dynamics differ substantially: credibility and expertise outweigh popularity; content must provide technical depth, data substantiation, and informational value; and outcomes should be assessed through lead quality, relationship depth, and long-term brand perception rather than short-term engagement metrics (Holliman and Rowley, 2014). While B2C influencer marketing benefits from well-developed conceptual frameworks, the B2B context lacks dedicated conceptualization and robust empirical validation. Moreover, limited knowledge exists regarding whether and how B2C practices transfer to B2B environments characterized by risk-averse decision-making, specialized niche audiences, and heightened reputational stakes (Mero et al., 2023).

This gap carries substantial managerial implications. B2B marketers face increasing pressure to adopt innovative digital strategies, yet often lack robust frameworks for influencer selection, collaboration design, and performance measurement. Applying B2C-derived tactics inappropriately risks undermining credibility and producing ineffective outcomes. Accordingly, this paper conducts a systematic comparative analysis of B2C and B2B influencer marketing with four objectives: (1) to review existing B2C influencer marketing literature and evaluate its applicability to B2B contexts; (2) to identify and analyze principal differences between B2C and B2B influencers regarding strategies, objectives, and outcomes; (3) to examine theoretical frameworks underpinning each type, highlighting where adaptation or new models are required; and (4) to provide managerial implications for firms designing effective B2B influencer marketing strategies. By integrating academic literature with real-world case evidence, the paper advances theoretical understanding of B2B influencer marketing while offering actionable practitioner guidance, positioning it as a promising yet under-researched domain warranting greater scholarly attention.

Literature Review

Influencer marketing in business-to-consumer contexts

Influencer marketing is largely grounded in B2C environments, where visibility and emotional appeal strongly shape strategy. In this domain, influencers operate as cultural intermediaries who offer authenticity, relatability, and entertainment value (Khamis et al., 2016). Their effect on consumer behavior is driven by trust and the parasocial relationships they cultivate with audiences (Venciute et al., 2023), allowing them to influence purchasing decisions through perceived authenticity rather than conventional celebrity endorsement mechanisms (Djafarova and Rushworth, 2017). Research shows that B2C influencers create value through multiple mechanisms, including projecting aspirational lifestyles that resonate with target demographics, producing visually compelling content tailored to platforms such as Instagram and TikTok, and sustaining community engagement through consistent and relatable communication (De Veirman et al., 2017).

The effectiveness of B2C influencer marketing has been widely documented across product categories and demographic groups. Evidence indicates that influencer recommendations can meaningfully increase purchase intentions, particularly among younger consumers who regard influencers as more trustworthy than traditional advertising (Freberg et al., 2011). Platform characteristics also shape effectiveness: visual platforms such as Instagram support lifestyle-based integration of products, while video platforms such as YouTube and TikTok enable

demonstrations and credible usage scenarios. At the same time, the literature highlights recurring challenges, including disclosure requirements, authenticity concerns when commercial ties become salient, and audience skepticism toward sponsored content (Boerman et al., 2017).

Influencer marketing in business-to-business contexts

Compared with the well-developed B2C literature, research on B2B influencer marketing remains limited and fragmented. Available studies suggest that B2B influencer marketing follows distinct logics. Rather than maximizing mass reach or emotional engagement, B2B influencers derive authority from demonstrated expertise, professional credentials, and thought leadership within specialized domains (Crisafulli et al., 2022). They commonly hold senior roles in consulting firms, occupy academic appointments, serve as industry analysts, or possess recognized technical expertise in specific sectors (Huotari et al., 2015). Their influence is rooted not in lifestyle aspiration but in their capacity to reduce decision complexity and perceived risk in organizational purchasing contexts.

Crisafulli et al. (2022) show that competence perceptions significantly shape buying decisions, with professional credibility operating as the primary influence mechanism. Vrontis et al. (2021) likewise report, through a systematic review, that B2B influencer marketing emphasizes long-term relationship development, knowledge sharing, and network position rather than transactional outcomes. Content strategies diverge from B2C practice, prioritizing white papers, industry reports, conference presentations, and LinkedIn articles over Instagram posts or TikTok videos (Holliman and Rowley, 2014). Platform choice reflects these priorities, with LinkedIn, industry-specific forums, and professional conferences functioning as the principal engagement venues rather than consumer-oriented social media platforms (Guesalaga, 2016).

Despite these contributions, important gaps remain regarding optimal influencer selection criteria in B2B contexts, effective collaboration models between firms and B2B influencers, appropriate performance metrics for B2B influencer campaigns, and long-term relationship dynamics between B2B influencers and organizational audiences (Mero et al., 2023). Much of the existing evidence is based on single-industry cases or lacks a longitudinal perspective, which constrains generalizability and slows theoretical development.

Theoretical foundations and framework adaptation

Several theoretical perspectives have been used to explain B2C influencer marketing effectiveness. The Elaboration Likelihood Model (Petty and Cacioppo, 1986) clarifies how

influencer credibility and message quality shape persuasion through central and peripheral processing routes. Social Identity Theory (Tajfel and Turner, 1986) explains how consumers align with influencers who represent desired social groups, while the Two-Step Flow of Communication model (Katz and Lazarsfeld, 1955) conceptualizes influencers as opinion leaders who mediate information flows from brands to consumers. Source Credibility Theory (Hovland and Weiss, 1951) is also central in accounting for why consumers accept influencer recommendations based on perceived expertise, trustworthiness, and attractiveness.

However, these B2C-derived frameworks require adaptation for B2B contexts, where different influence mechanisms predominate. Relationship Marketing Theory (Berry, 1983; Morgan and Hunt, 1994) provides more suitable grounding for B2B influencer relationships, emphasizing sustained trust development, commitment, and mutual value creation rather than transactional exchanges. The Commitment-Trust Theory further proposes that successful relationships rest on both parties perceiving commitment and trust as foundational, which is directly relevant to B2B influencer-organization relationships (Morgan and Hunt, 1994). Network Influence Models, including structural hole theory (Burt, 1992) and weak tie theory (Granovetter, 1973), help explain how B2B influencers gain influence through network position, enabling them to broker information and connect actors across organizational boundaries. Diffusion of Innovations theory (Rogers, 2003) also applies by explaining how B2B influencers act as early adopters and opinion leaders who accelerate technology and practice adoption within professional communities.

This theoretical divergence reinforces the need for a dedicated conceptualization of B2B influencer marketing. Whereas B2C frameworks foreground emotional connection, parasocial relationships, and lifestyle alignment, B2B frameworks must emphasize professional credibility, knowledge transfer, risk reduction, and long-term relationship capital. This distinction implies that B2B influencer marketing is a distinct phenomenon that requires its own theoretical development rather than straightforward adaptation of B2C models.

Comparative Analysis: Key Distinctions Between B2B and B2C Influencer Marketing

Synthesizing the reviewed literature reveals several fundamental distinctions between B2B and B2C influencer marketing across multiple dimensions. Table 1 presents a comprehensive comparison of these differences, highlighting how the two domains operate according to distinct logics.

Table 1. Comparative Analysis of B2C and B2B Influencer Marketing

Dimension	B2C Influencers	B2B Influencers
Strategic Role	Cultural ambassadors; trendsetters; emotional connectors	Knowledge brokers; thought leaders; credibility builders
Content	Visual, emotive, lifestyle-oriented (short videos, images, unboxing, stories)	Informative, technical, data-driven (white papers, webinars, case studies, reports)
Platforms	Instagram, TikTok, YouTube, Snapchat	LinkedIn, Twitter (X), industry blogs, webinars, professional forums
Audience	Large, heterogeneous, mass-market consumers	Small, niche, industry-specific professionals and decision-makers
Engagement Style	Broad, viral, parasocial interactions; immediate resonance	In-depth, rational, trust-based; long-term conversations
Metrics of Success	Impressions, likes, shares, conversions, brand visibility	Lead quality, credibility, engagement depth, trust, long-term relationships
Time Horizon	Short-term, campaign-driven (weeks/months)	Long-term, relationship-driven (months/years)
Risks	Over-commercialization; loss of authenticity; influencer scandals; fleeting impact	Misalignment of expertise; reputational risk; slow returns

Theoretical and Managerial Implications

Theoretical implications

This comparative analysis yields several important theoretical implications. First, the findings challenge the implicit assumption that B2C influencer marketing frameworks can be straightforwardly transferred to B2B contexts. The fundamental differences in influence mechanisms, content strategies, and relationship dynamics suggest that B2B influencer marketing requires dedicated theoretical development. The Elaboration Likelihood Model (Petty and Cacioppo, 1986), valuable in B2C contexts for explaining peripheral route processing through influencer attractiveness and likability, may have limited applicability in B2B environments where central route processing through systematic evaluation of expertise and evidence predominates (Crisafulli et al., 2022). Similarly, Social Identity Theory (Tajfel and Turner, 1986) requires reconceptualization for B2B contexts where professional identity, organizational affiliation, and industry membership represent more relevant identity dimensions (Vrontis et al., 2021).

Second, the analysis highlights the need for theoretical integration across multiple domains. Relationship Marketing Theory (Berry, 1983; Morgan and Hunt, 1994; Palmatier et al., 2006) offers essential insights into how B2B influencer relationships develop through iterative trust-

building processes, but should be complemented by Network Theory perspectives (Burt, 1992; Granovetter, 1973) that clarify how influencer power stems from structural network positions and information brokerage capacity. Integrating Diffusion of Innovations theory (Rogers, 2003) with network approaches appears especially promising, as B2B influencers often function as opinion leaders whose network centrality accelerates innovation adoption across professional communities. Incorporating Knowledge-Based View perspectives (Grant, 1996) could further strengthen understanding of how B2B influencers create value through specialized knowledge transfer.

Third, the identified distinctions suggest that influencer marketing scholarship may benefit from context-specific theory building rather than seeking universal principles across market types. This aligns with broader calls for middle-range theories that recognize contextual variation rather than pursuing grand theories claiming universal applicability (Hunt, 2010). In particular, B2B influencer marketing theory should account for organizational buying center dynamics (Webster and Wind, 1972), complex multi-stakeholder decision processes, and risk-averse evaluation criteria that fundamentally differentiate organizational from individual consumer decision-making.

Fourth, the analysis reveals opportunities to extend Source Credibility Theory (Hovland and Weiss, 1951) to better reflect B2B contexts. While the theory has informed understanding of influencer trustworthiness and expertise perceptions in B2C settings, B2B environments require an expanded conceptualization of credibility dimensions. Professional credentials, industry recognition, publication records, conference speaking engagements, and advisory board memberships may constitute more relevant credibility signals than attractiveness, likability, and social media metrics. Finally, the analysis points to productive connections with established B2B literature streams that have received limited attention in influencer research, including industrial thought leadership (Magno and Cassia, 2020), B2B content marketing (Holliman and Rowley, 2014; Järvinen and Taiminen, 2016), and social media use in B2B sales (Guesalaga, 2016). Integrating these streams with emerging influencer research could accelerate theoretical development while grounding B2B influencer scholarship in accumulated knowledge on organizational buying behavior, professional networks, and industrial marketing dynamics.

Managerial implications

B2B influencer marketing effectiveness begins with a rigorous approach to influencer selection. Rather than prioritizing follower counts or surface engagement metrics,

organizations should assess influencers through professional credibility, demonstrated subject matter expertise, industry recognition, and network centrality within relevant communities. Signals such as publications, conference presentations, advisory roles, and sustained contributions to professional discourse provide more diagnostic indicators of influence than the popularity cues that often dominate B2C selection processes (De Veirman et al., 2017; Crisafulli et al., 2022). Firms should therefore formalize selection scorecards that incorporate these credibility dimensions and weight them according to sector and buying center priorities.

Value creation in B2B collaborations is shaped by the form of the partnership, and relationships are typically more effective when designed as sustained engagements that support knowledge co-creation and repeated interaction rather than short campaign-based transactions (Vrontis et al., 2021). Practical configurations include advisory board participation, joint research initiatives, co-authored thought leadership assets, conference keynote appearances, executive roundtable facilitation, and recurring expert commentary on market developments (Holliman and Rowley, 2014). To protect authenticity while enabling mutual benefit, firms can provide access to data, audiences, and co-branding opportunities that strengthen the influencer's professional standing while allowing the organization to benefit from expertise and network reach (Huotari et al., 2015).

Content development should align with how organizational audiences evaluate information under uncertainty. Effective B2B influencer content privileges technical depth, data substantiation, and actionable guidance, thereby supporting central route processing and credible problem framing in complex purchasing situations (Järvinen and Taiminen, 2016). White papers, case studies, webinars, analytical articles, and evidence-based frameworks tend to outperform entertainment-oriented formats because they translate expertise into decision support. Co-creation processes are particularly important, since they help ensure that content remains accessible while retaining sufficient rigor to withstand scrutiny from specialist stakeholders.

Channel strategy should follow professional information-seeking behavior. LinkedIn often functions as the primary arena for thought leadership diffusion in B2B, complemented by industry publications, professional communities, webinars, and conference platforms where decision-makers actively search for domain-relevant insights (Guesalaga, 2016). An integrated approach that combines owned channels, earned visibility, and influencer distribution can amplify reach without diluting message consistency, provided that governance and editorial standards maintain the professional tone expected in B2B communication.

Measurement practices need to reflect extended sales cycles and multi-stakeholder decision dynamics. Beyond short-term engagement metrics, evaluation should emphasize lead quality, pipeline contribution, influenced revenue, relationship development with priority accounts, and shifts in perceived credibility among target segments (Holliman and Rowley, 2014). Attribution models should be calibrated to capture indirect and lagged effects, recognizing that influence often accumulates through repeated exposure and trust formation rather than immediate conversion (Morgan and Hunt, 1994). Strong marketing and sales alignment is essential for connecting influencer-driven awareness and legitimacy to pipeline progression and revenue outcomes.

Finally, risk governance is essential because reputational stakes are high and expertise misalignment can erode brand legitimacy. Key risks include insufficient domain fit, credibility shocks that spill over to the brand, conflicts of interest arising from collaborations with competitors, and evaluative ambiguity created by attribution complexity. Clear governance frameworks should define exclusivity expectations, disclosure requirements, content approval processes, and review routines that periodically reassess strategic alignment as markets evolve (Boerman et al., 2017).

Conclusions

This paper provides a systematic comparative analysis of B2C and B2B influencer marketing, demonstrating that these domains operate according to fundamentally different logics that require distinct strategic approaches and theoretical frameworks. While B2C influencer marketing emphasizes visibility, emotional engagement, and transactional outcomes, B2B influencer marketing prioritizes credibility, expertise, and sustained relationship development. These differences are evident across influencer characteristics, content strategies, platform selection, performance metrics, and the underlying mechanisms of influence, as synthesized in Table 1.

The analysis also indicates that frameworks developed for B2C contexts require substantial adaptation or replacement when applied to B2B environments. Whereas B2C frameworks emphasize emotional connection, parasocial relationships, and social identity alignment (Tajfel and Turner, 1986; Khamis et al., 2016), B2B contexts require theories that address professional credibility, knowledge transfer, organizational risk reduction, and long-term relationship capital. Relationship Marketing Theory (Berry, 1983; Morgan and Hunt, 1994), commitment-

trust frameworks, and Network Influence Models (Burt, 1992; Granovetter, 1973) offer more suitable foundations than frameworks developed for consumer contexts.

From a managerial perspective, the findings underscore the importance of context-appropriate strategy design. B2B organizations cannot simply transpose B2C influencer tactics; instead, they must develop approaches aligned with professional audience characteristics, organizational decision-making processes, and B2B market dynamics. This requires influencer selection criteria that prioritize expertise over reach, collaboration models focused on sustained partnerships rather than discrete campaigns, content strategies that privilege technical depth over emotional appeal, and performance metrics that reflect extended sales cycles and multiple stakeholders.

Limitations and Suggestions for Further Research

This paper is positioned as a conceptual contribution. It advances knowledge through a structured synthesis of existing literature, theoretical integration across multiple frameworks, and the systematic comparison of B2B and B2C influencer marketing logics. Given the nascent state of B2B influencer marketing as a scholarly field, conceptual work that identifies boundary conditions, clarifies theoretical applicability, and maps research priorities constitutes a necessary and valuable contribution in its own right (Jaakkola, 2020). The paper does not seek to test hypotheses or generate statistical inference; rather, it aims to provide the theoretical scaffolding upon which future empirical work can be designed and situated.

Despite these contributions, the study has limitations that suggest directions for future research. The analysis relies primarily on secondary literature and case examples rather than primary empirical data, which limits causal claims about B2B influencer effectiveness. Future research should use experimental designs, longitudinal field studies, and multi-stakeholder perspectives to test propositions regarding B2B influencer impact more rigorously. In addition, while this paper identifies key differences between B2B and B2C influencer marketing, it does not examine variation within B2B settings across industries, organizational sizes, or cultural contexts; comparative research investigating such variation would meaningfully extend this work.

Several research priorities emerge from this analysis. First, scholars should develop and empirically validate theoretical frameworks designed specifically for B2B influencer marketing rather than adapting B2C models, integrating insights from Relationship Marketing Theory, Network Theory, and Knowledge-Based View perspectives while accounting for

organizational buying center dynamics. Second, research should examine the mechanisms through which B2B influencers reduce organizational decision-making risk and support complex purchasing processes. Third, studies should investigate optimal collaboration models between firms and B2B influencers, including governance structures, compensation approaches, and relationship management practices that balance commercial objectives with the maintenance of influencer credibility. Fourth, research should develop and validate performance measurement approaches that capture B2B influencer marketing value over extended sales cycles, potentially incorporating customer lifetime value perspectives and multi-touch attribution modeling. Fifth, scholars should explore how emerging technologies, including artificial intelligence, virtual reality, and blockchain, may reshape B2B influencer marketing practices.

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ART INTEGRATION IN LUXURY REAL ESTATE BRANDING AND MARKETING IN CYPRUS

Batamirova, Daria; Thrassou, Alkis
University of Nicosia, School of Business, Nicosia, Cyprus

Keywords: Luxury Branding, Luxury Real Estate, Cyprus Real Estate Market, Artification, Art, Art Collaborations, Public Art.

In the context of global economic uncertainty and increasing market volatility, not only mass-market segments but also the luxury sector is facing growing pressure. Luxury real estate, often perceived as resilient, is undergoing structural changes driven by shifting buyer expectations, increased competition, and the need for stronger differentiation (Etzel 2024).

In destinations such as Cyprus, the luxury segment plays a critical role not only as an economic driver but also as a benchmark for overall market quality and international positioning (Mavrigiannakis, Sakkas 2025). Maintaining and elevating this standard has become essential for sustaining long-term competitiveness.

The luxury real estate market in Cyprus has been undergoing rapid transformation (Nussupbekova 2025). The passport program is no longer the primary driver of luxury real estate purchases, so buyers need to clearly understand the value of the property. (Rakopoulos 2023). Millennials and Generation Z are driving a rethinking of the value that luxury provides. (Vrontis et al. 2025). Traditionally positioned as a family-friendly and leisure-oriented destination (Koutra, Karyopouli 2013) rather than a global luxury hub, Cyprus now requires effective approaches to marketing high-end residential and business properties beyond standard attributes such as location, quality, and amenities (Shelby 2024).

Although artification practices (Marin, Barra & Moyano 2022) are becoming more visible in leading global markets as a solution for value creation and differentiation (Hagtvedt, Patrick 2008), their role within the Cypriot context remains underexplored. This research aims to investigate how luxury real estate projects in Cyprus incorporate art as part of their branding and marketing strategies and how this contributes to perceived value, differentiation, and attractiveness to international and local audiences.

The research is grounded in theories of luxury branding, experiential marketing, and symbolic consumption (Derval 2024), with particular attention to the concept of artification as a mechanism for value enhancement (Kapferer 2014). Existing literature highlights the growing importance of intangible assets such as identity, storytelling, and cultural capital in luxury markets (Zhou, Sanz-Hernández & Hernández-Muñoz 2024). However, most studies focus on established luxury sectors (Green 2025), while limited attention has been given to markets transitioning from leisure-oriented destinations to emerging luxury destinations.

The study examines selected residential developments that integrate art into their concept and branding, including projects such as Art Square Residence and developments influenced by branded residence models such as YOO by Philippe Starck. The analysis also considers local practices that extend art integration beyond architecture into cultural programming and landmark installations. Reserch examines BBF ArtCargo Performing Arts Festival case, positioning real estate as a cultural platform, The Icon in Limassol featuring the large-scale "Wild Kong" sculpture by Richard Orlinski as a visual landmark and branding symbol, XeniArtScape, a modern and contemporary art galleries in the heart of Limassol's Trilogy Plaza, a modern and contemporary art gallery and curated art events and the Minthis Gallery. These cases illustrate diverse approaches to art integration, including architectural expression, curated spaces, cultural initiatives, and iconic installations.

This study employs an exploratory qualitative research design based on case study analysis and semi-structured expert interviews. At the first stage, a purposive sampling strategy was used to identify luxury and branded residential real estate projects in Cyprus where art is visibly integrated into branding, marketing, architecture, public space (Zhou, Sanz-Hernández & Hernández-Muñoz 2024), cultural programming, or customer experience. Publicly available project materials, including developer websites, promotional content, press publications, and visual communication, were reviewed to select cases in which art functions as part of the project's value proposition and market positioning rather than as a purely decorative element. At the second stage, six semi-structured interviews were conducted with key informants involved in the artification process, including representatives of developers who influenced strategic decisions regarding the integration of art. The interviews focused on the motivations behind art integration, its perceived effectiveness, its role in differentiation and value creation, and the challenges, risks, and limitations associated with implementation. The data were analyzed thematically and compared with the selected case materials to identify recurring

patterns in the use of art as a branding and marketing tool in the Cypriot luxury real estate market.

The study suggests that art integration in the Cypriot luxury real estate market acts as a strategic response to increasing competition and the need to enhance perceived value. Although most cases are concentrated in Limassol, there are also isolated examples in other key cities, including Nicosia, Larnaca, and Paphos.

The study contributes theoretically by extending the concept of artification to real estate and highlighting the role of symbolic value in market repositioning. Practically, it shows that art can serve as an effective tool for differentiation, international appeal, and premium value creation when integrated into both the physical environment (Matthews, Gadaloff 2022) and brand narrative. It also supports long-term communication strategy by creating a recognizable developer narrative, strengthening investment value, and generating cultural and leisure points of attraction for residents, visitors, tenants, and wider island audiences.

In markets such as Cyprus, where the luxury real estate segment is rapidly evolving, sustaining excellence is essential, as it sets quality benchmarks, shapes international perception, and strengthens overall competitiveness.

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EMOTIONAL AND BEHAVIOURAL DRIVERS OF FOOD TECHNOLOGY NEOPHOBIA AND NOVEL FOOD ADOPTION AMONG GREEK YOUNG ADULT CONSUMERS: IMPLICATIONS FOR DIGITALLY MEDIATED CONSUMPTION

Thanasoula, Panagiota [1]; Tsikkou, Emily[1]; Melillos, George[1]

[1]College of Business Studies Cyprus (CBS), Nicosia, Cyprus

Keywords: Food Technology Neophobia, Novel Food Adoption, Emotional Dispositions, Consumer Behaviour, Innovation Resistance, Digital Consumption, Artificial Intelligence, Greek Young Adults.

Abstract

Artificial intelligence and digital recommendation systems increasingly influence the ways in which consumers encounter, compare and evaluate food products. However, empirical claims about AI-mediated consumption must be aligned with the variables actually measured. This paper therefore examines food technology neophobia and novel food adoption among Greek young adult consumers aged 18-29, while treating AI-mediated consumption as a contextual implication rather than the direct empirical object of the study. The research draws on quantitative survey data from 320 participants and uses Principal Component Analysis with Varimax rotation to identify latent emotional, behavioural and attitudinal dimensions of novel food adoption. The results show that emotional states form two interpretable dimensions: avoidance of novel food under negative emotions and willingness to try novel food under positive emotions. The Food Technology Neophobia Scale items produced a one-component solution explaining 70.004% of variance, with excellent internal consistency. Further analyses identified health and quality motivation, social and professional recommendation, commercial and media influence, functional and health-oriented product acceptance, technological-food reluctance, and access or price-related constraints as relevant dimensions of novel food behaviour. The findings indicate that Greek young adults are generally open to trying new foods, but remain cautious toward highly technological food categories such as genetically modified, irradiated, nanotechnology-based, laboratory-cultivated and 3D-printed foods. The study contributes to consumer behaviour literature by linking food technology neophobia with emotional dispositions, innovation resistance, perceived health value, social influence and digital exposure. Its practical value lies in showing that future digitally mediated and AI-

supported food environments should preserve transparency, user control and trust, especially where technological novelty may trigger uncertainty or emotional resistance.

Introduction

Food consumption is increasingly influenced by technological innovation. Novel food products, alternative ingredients, new processing methods, functional foods, personalised nutrition systems and digitally mediated food retail environments create new opportunities for consumer choice, but also new forms of uncertainty, scepticism and resistance. Consumers are not only asked to evaluate taste and price; they are also required to interpret claims about safety, naturalness, health, sustainability and technological intervention.

Artificial intelligence has become an important part of contemporary marketing and consumer decision-making. AI-supported systems may personalise recommendations, structure information flows, identify consumer segments and influence the salience of particular product attributes. Prior research therefore raises issues of transparency, consumer autonomy, over-reliance and the ethical design of digital choice architectures (Davenport et al., 2020; Huang and Rust, 2021; Puntoni et al., 2021).

Nevertheless, not every study that discusses AI-mediated consumption is empirically a study of AI. This distinction is central to the present paper. The data analysed here do not directly measure consumer interaction with AI systems, algorithmic recommendations, perceived algorithmic transparency or ethical judgement in AI-mediated environments. The empirical core of the paper is food technology neophobia and novel food adoption among Greek young adults aged 18-29. AI-mediated consumption is treated as a future-facing context because the same emotional and behavioural dispositions that shape receptiveness to novel foods may also influence how consumers respond to personalised and digitally mediated food-choice environments.

The aim of this study is to explore the emotional and behavioural dimensions underlying food technology neophobia and novel food adoption among Greek young adult consumers. A secondary objective is to discuss how these dispositions may inform future digitally mediated and AI-supported food environments. The study addresses three research questions: what emotional dimensions structure willingness or reluctance to try new foods; what behavioural and attitudinal factors shape novel food adoption; and what implications these findings may have for digitally mediated and AI-supported food-consumption environments.

Literature Review and Theoretical Framework

Novel food adoption and consumer behaviour

Novel food adoption is a multidimensional consumer behaviour phenomenon influenced by perceived usefulness, perceived risk, familiarity, trust, social norms, cultural values and individual innovativeness. Innovation adoption theory suggests that consumers are more likely to accept new products when they perceive relative advantage, compatibility with existing values, reduced complexity, trialability and observable benefits (Rogers, 2003). In the food domain, adoption is especially sensitive because food is linked to bodily integrity, health, identity, tradition and moral meaning.

The theory of planned behaviour is relevant because food adoption depends on attitudes, subjective norms and perceived behavioural control (Ajzen, 1991). Consumer resistance theory adds a further explanatory layer: consumers may resist innovations not because they are irrational, but because innovations disrupt habits, cultural meanings, perceived safety expectations or identity-related preferences (Ram and Sheth, 1989). This is particularly relevant in food markets, where resistance often reflects concerns about naturalness, technological interference and perceived loss of control over consumption.

Food technology neophobia and emotional response

Food technology neophobia is a specific form of resistance directed at foods produced, processed or modified through novel technologies. Cox and Evans (2008) developed the Food Technology Neophobia Scale to measure consumers' fears and reluctance toward novel food technologies. The construct differs from general food neophobia, which was originally conceptualised as reluctance to eat or avoidance of novel foods (Pliner and Hobden, 1992).

Food technology neophobia is relevant because many contemporary food innovations require consumers to accept scientific or technological mediation, including genetically modified foods, irradiated foods, nanotechnology-enabled foods, laboratory-cultivated products and 3D-printed foods. Prior research on consumer acceptance of novel food technologies shows that perceived risk, disgust, cultural values and trust can affect acceptance (Siegrist and Hartmann, 2020). Emotional responses are therefore not peripheral; consumers may respond to food technologies through anxiety, distrust, scepticism, curiosity or openness before they engage in deliberate evaluation.

Digital and AI-supported food environments

AI and digital technologies increasingly shape food-related decision environments. Personalised recommendation systems, targeted advertising, nutrition apps, online retail platforms and algorithmically curated content can influence what consumers see, compare and consider relevant. AI may therefore affect not only the information consumers receive, but also how alternatives are framed and evaluated (Davenport et al., 2020; Huang and Rust, 2021).

This paper does not empirically test AI-specific mechanisms. It instead positions AI-supported food environments as an interpretive context. The logic is that emotional openness, technological-food reluctance, trusted recommendation and commercial exposure are likely to matter in future personalised food-choice architectures. The conceptual relationship used in the paper is presented in Figure 1.

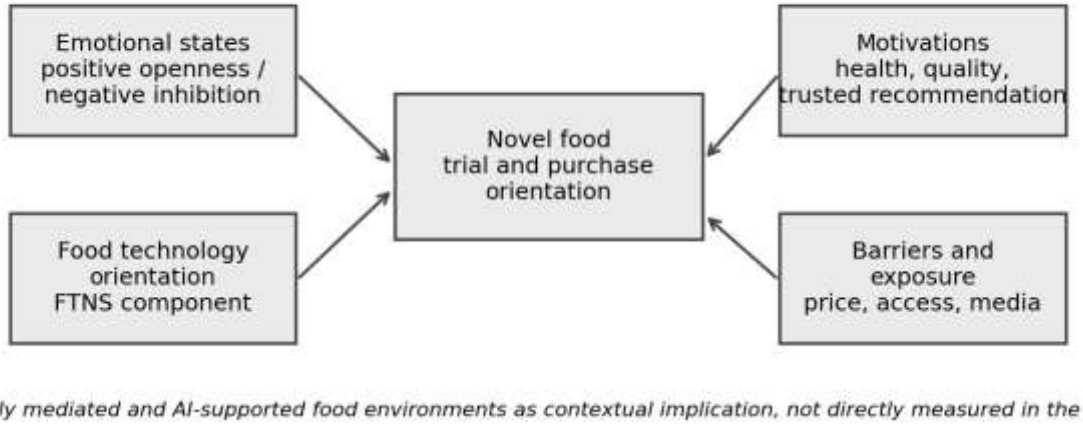


Figure 1: Conceptual framing of measured constructs and AI-mediated contextual implication

Methodology

Research design and data

The study used a quantitative exploratory survey design. The final sample consisted of 320 Greek young adult consumers aged 18-29. The sample included 179 women (55.9%) and 141 men (44.1%). In terms of age, 172 participants (53.8%) were aged 18-24 and 148 participants (46.3%) were aged 25-29. The sample included respondents from Athens or Thessaloniki, large provincial cities or prefectural capitals, smaller provincial towns and villages. The sample should be interpreted as exploratory and not as statistically representative of the entire Greek population.

The questionnaire included demographic items, food-related behavioural questions and Likert-type items measuring attitudes toward new foods, emotional states, social and commercial influence, food technology acceptance and purchasing motivations. The study focuses on the quantitative survey data and does not claim to directly measure interaction with AI systems.

Analytical approach

Principal Component Analysis was used as an exploratory data-reduction technique. The analyses were conducted with Varimax rotation and Kaiser normalisation where more than one component was retained. Components were retained where eigenvalues exceeded 1 and where the resulting structure was theoretically interpretable. Reliability was assessed using Cronbach's alpha.

The available exported SPSS outputs used for this paper reported eigenvalues, percentage of variance explained, communalities, component loadings and Cronbach's alpha. They did not include Kaiser-Meyer-Olkin or Bartlett's test tables. For this reason, no KMO or Bartlett values are reported in the paper. This methodological wording is intentional: the analysis reports only the diagnostics available in the verified outputs and does not infer or reconstruct omitted adequacy statistics.

To keep the paper focused, the findings foreground three empirically central analyses: emotional-state dimensions, the Food Technology Neophobia Scale structure, and the broader six-component model of attitudes, motivations and barriers toward new foods. Additional PCA outputs concerning trial, purchase and food-category groupings are used only to support interpretation where directly relevant.

Findings

Descriptive findings

The descriptive results indicate that Greek young adult consumers in the sample are generally open to trying new foods. A large majority of participants reported that they try new tastes (82.5%), while 17.5% reported that they do not. Among those who avoid trying new foods, the most common barrier was fear of the unknown (58.9%), followed by previous bad experience (26.8%) and health reasons (14.3%).

The Food Neophobia Scale items show a mixed but generally open profile. For example, 56.2% of respondents agreed or strongly agreed that they constantly try new or different

foods, and 66.8% agreed or strongly agreed that they like foods from different countries. At the same time, responses reveal uncertainty. For the item “I do not trust new foods”, 57.2% selected the neutral category. For the item “If I do not know what a food contains, I will not try it”, 41.6% remained neutral, while 25.7% agreed or strongly agreed.

The results are more restrictive for technologically produced foods. Willingness to try genetically modified foods was low, with 72.9% disagreeing or strongly disagreeing. Similar reluctance was found for irradiated foods, nanotechnology-produced foods, foods with artificial flavour or colour, biotechnology-produced foods and foods produced through new food technologies. This indicates that general openness to new foods does not automatically translate into acceptance of technologically produced foods.

Emotional dimensions of trying new foods

The PCA of five emotional-state variables produced two components with eigenvalues greater than 1, explaining 63.265% of total variance. The first component had an eigenvalue of 2.152 and explained 43.045% of variance. The second component had an eigenvalue of 1.011 and explained 20.220% of variance. After Varimax rotation, the two components explained 32.642% and 30.623% of variance respectively.

The first component was interpreted as negative emotional inhibition. It loaded highly on sadness-related avoidance of unfamiliar foods (0.770) and stress-related reduced willingness to try foods (0.863). The boredom item loaded more weakly and ambiguously (0.446), suggesting that boredom does not clearly belong to either emotional dimension. The second component was interpreted as positive emotional openness. It loaded highly on willingness to try new foods when happy (0.838) and when calm (0.789). Reliability was modest, with alpha values of 0.580 and 0.593 for the two components and an overall alpha of 0.661 for the emotional-state item set. These values are treated as exploratory rather than confirmatory.

Food Technology Neophobia Scale structure

The PCA of the eight Food Technology Neophobia Scale items produced a single component with an eigenvalue of 5.600, explaining 70.004% of total variance. All items showed strong positive loadings, ranging from 0.778 to 0.865. The highest loadings were observed for willingness to try foods produced using biotechnology (0.865), foods with artificial flavour (0.861), foods produced using new food technologies (0.859), irradiated foods (0.858), foods with artificial colour (0.842), genetically modified foods (0.830), nanotechnology-produced

foods (0.794) and foods containing preservatives (0.778). Reliability was excellent, with Cronbach's alpha = 0.938.

Because the FTNS items in the dataset are phrased as willingness to try technological foods, the coding direction is important. Where higher scores indicate greater willingness, the component is more accurately interpreted as technology-food acceptance. Where scores are reverse-coded, it may be interpreted as food technology neophobia. The paper therefore uses the cautious expression "technology-food acceptance/neophobia orientation" when referring to this component.

Attitudes, motivations and barriers toward new foods

The broader PCA of twenty-six variables produced six components with eigenvalues greater than 1, explaining 73.218% of total variance. Overall reliability was excellent, with Cronbach's alpha = 0.938. The first component was interpreted as health, quality and self-improvement motivation, with high loadings on perceived health benefit (0.828), better quality (0.794), attention to health (0.760), attention to diet (0.694), health reasons (0.632) and enjoyment of exploring new tastes through cooking (0.545).

The second component was interpreted as instrumental acceptance and informed trial. It included willingness to try new foods through free samples (0.772), eating new foods even if disliked when they improve health (0.861), eating new foods even if disliked when they improve appearance (0.796), avoidance of new foods while exercising or dieting (0.507), and access-based preference (0.429). The third component was interpreted as social prompting and viral influence, loading on encouragement by relatives (0.729), encouragement by friends (0.709), trying products when viral on social media (0.702), buying and eating new foods at every opportunity (0.468), and buying new foods to improve appearance (0.586).

The fourth component reflected family, peer and specialised-context influence, including parental use (0.839), others' use (0.797), specialised restaurants (0.622), and specialised stores (0.492). The fifth component reflected commercial and influencer exposure, loading on supermarket visibility (0.751), advertising (0.870), and influencer use on social media (0.603). The sixth component reflected price, access and sceptical restraint, loading on high price (0.703), lack of access (0.658), and the belief that not all new products need to be tried (0.723). Component reliabilities were 0.895, 0.835, 0.851, 0.828, 0.843 and 0.686 respectively.

Analysis	Items	Components	Variance explained	Reliability	Interpretation
Emotional states and trial	5	2	63.265%	Overall alpha = 0.661	Negative inhibition; positive openness
FTNS orientation	8	1	70.004%	Alpha = 0.938	Technology-food acceptance/neophobia orientation
Attitudes, motivations and barriers	26	6	73.218%	Overall alpha = 0.938	Health/quality; informed trial; social prompting; specialised context; commercial exposure; barriers

Table 1: Summary of principal component analyses and reliability results

Discussion

Emotional openness and inhibition

The emotional-state analysis indicates that willingness to try new foods is not only cognitive or informational. It is also shaped by affective conditions. Happiness and calmness form a positive openness dimension, while sadness and stress form an inhibitory dimension. The reliability of these components is modest, so the finding should be treated as exploratory. Nevertheless, the structure is theoretically meaningful because food choices are embedded in mood, perceived safety and readiness to experiment.

Different forms of novelty are evaluated differently

The strongest empirical pattern is that general openness to new foods coexists with reluctance toward technologically produced foods. Functional and health-oriented novelty appears more acceptable when it is associated with familiar consumer benefits, such as health, quality, diet, wellbeing or appearance. By contrast, technologically intensive novelty appears more likely to trigger reluctance. This distinction matters because “novel food adoption” is not a single attitude: consumers may accept one form of innovation while resisting another.

Trust, recommendation and exposure

The findings show that health value, credible information and recommendation are central to novel food adoption. Commercial visibility, advertising, supermarket promotion and influencer exposure may increase awareness, but they do not perform the same trust-building role as expert or interpersonal recommendation. For technologically sensitive foods, visibility alone is unlikely to be sufficient. Trust, safety explanation and consumer control are likely to be more important.

Implications for digitally mediated and AI-supported consumption

The study does not directly measure AI interaction and therefore does not claim that AI-mediated decision environments caused the observed attitudes. Its contribution is more specific: it identifies consumer-level factors that are likely to matter when novel foods are promoted through digital or AI-supported environments. AI-supported recommendation systems may expose consumers to novel food products, personalise health claims and frame products according to predicted preferences. If these systems promote functional foods with clear health benefits, consumers may be more receptive. If they promote highly technological foods without transparent explanation, consumers may become more sceptical.

Practical implications follow directly from the findings. For functional foods, communication should emphasise health benefit, quality and personal wellbeing. For technologically intensive foods, communication should prioritise safety evidence, production transparency, regulatory approval and trusted expert endorsement. For AI-supported recommendation systems, platforms should explain why a product is recommended, identify the food technology involved, allow users to adjust recommendation categories and provide clear opt-out or rejection options. This protects consumer autonomy and reduces the risk of exploiting emotional uncertainty.

Limitations and Future Research

The study has limitations. First, it is based on cross-sectional self-reported survey data; the results identify exploratory patterns but do not establish causal relationships. Second, the sample consists of Greek young adults aged 18-29 and should not be generalised to all Greek consumers or other age groups without further testing. Third, the emotional-state components showed modest reliability and require further validation. Fourth, the exported PCA outputs used for this paper did not include KMO or Bartlett's test values; therefore, these adequacy statistics are not reported. Future analysis should include the full SPSS factor-analysis diagnostic tables if the paper is extended into a journal article.

Most importantly, the study does not directly measure AI interaction, algorithmic recommendation, perceived algorithmic transparency, perceived autonomy in digital environments or ethical judgement in AI-mediated consumption. The AI-related discussion is therefore interpretive and future-facing rather than directly empirical. Future research should incorporate AI-specific variables, including trust in algorithmic recommendations,

explainability, perceived manipulation, data privacy concern, perceived autonomy and willingness to accept AI-personalised food recommendations.

Conclusion

This paper examined emotional and behavioural drivers of food technology neophobia and novel food adoption among Greek young adult consumers aged 18-29. The findings show that general openness to trying new foods coexists with caution toward technologically produced foods. Emotional states, health and quality motivations, trusted recommendation, media exposure, product category and access or price-related barriers all shape consumer responses to novel foods.

The paper's contribution lies in providing an empirically grounded account of novel food adoption and food technology orientation, while offering a cautious bridge to digitally mediated and AI-supported food environments. Future AI-enabled food recommendation systems should not treat consumers as uniformly innovation-seeking. They should account for trust, transparency, emotional vulnerability and consumer control.

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FROM GENAI PERSONALISATION TO SUSTAINABLE PURCHASE INTENTION: EXAMINING GEN Z'S PURCHASE INTENTION IN AI-ENABLED MARKETING

Sandreen Hitti[1], Emmanouela Kokkinopoulou[2], Eleni Trichina[3], Ioanna Papasolomou[4]

Suliman S. Olayan School of Business, American University of Beirut, Beirut, Lebanon

[2] *School of Business, University of Nicosia, Nicosia, Nicosia, Cyprus*

[3]*School of Business, University of Nicosia, Nicosia, Nicosia, Cyprus*

[4] *School of Business, University of Nicosia, Nicosia, Cyprus*

Keywords: GenAI, Personalisation, Gen Z, Trust, Emotions, Anthropomorphism, Ethical Disclosure, Sustainable Purchase Intention

Introduction

The growing adoption of GenAI has reshaped digital marketing by enabling organisations to create personalised and interactive customer experiences. Existing research suggests that AI-powered personalisation improves customer engagement, facilitates purchase decisions, and strengthens trust in digital environments (Vrontis et al., 2024; Kumar et al., 2024). More recent studies emphasise that consumers' responses to AI are also influenced by human-like system characteristics and transparent communication regarding AI usage, both of which enhance confidence in AI-mediated interactions (Alalwan et al., 2025; Wang et al., 2025). These developments highlight the need to examine sustainable purchase intention from an integrated perspective that considers technological, psychological, and ethical dimensions, particularly among Generation Z consumers (Campbell, 2026).

Purpose and objectives

The purpose of this study is to examine how GenAI-driven personalisation influences Generation Z's sustainable purchase intention. Specifically, the study investigates the mediating roles of positive emotions, negative emotions, and trust, together with the moderating effects of anthropomorphism and ethical disclosure. Grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT), the study aims to develop and empirically test a conceptual framework

that explains how psychological and ethical factors shape sustainable consumer behaviour in AI-enabled marketing environments.

Literature Review

Previous studies suggest that GenAI-driven personalisation enhances consumer engagement, improves decision-making, and strengthens trust by delivering tailored recommendations and interactive shopping experiences (Vrontis et al., 2024; Kumar et al., 2024). Furthermore, anthropomorphic AI has been shown to foster emotional connections with consumers, while ethical disclosure increases transparency and credibility, encouraging greater acceptance of AI-enabled marketing (Alalwan et al., 2025; Wang et al., 2025). Collectively, these studies indicate that integrating personalisation with psychological and ethical considerations can positively influence sustainable consumer behaviour, particularly among Generation Z (Campbell, 2026). Unlike general purchase intention, sustainable purchase intention reflects consumers' willingness to support products and brands that align with environmental and social values (White et al., 2019). This distinction is particularly relevant for Generation Z, whose purchasing decisions are increasingly influenced by sustainability concerns and responsible business practices (Campbell, 2026). Therefore, sustainable purchase intention represents a more appropriate outcome for examining consumer responses to GenAI-enabled marketing.

Theoretical Framework

This study is grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT), which explains individuals' acceptance and use of emerging technologies through four key determinants of technology adoption (Venkatesh et al., 2003). Although UTAUT has been widely applied to explain AI adoption, it offers limited explanation of the psychological and ethical mechanisms underlying consumer responses to GenAI-driven marketing (Hwang et al., 2025). Specifically, while UTAUT explains why individuals adopt new technologies, it does not explicitly account for the emotional and ethical processes that shape consumers' post-adoption responses in AI-enabled marketing environments. Accordingly, this study extends UTAUT by positioning emotions and trust as psychological mechanisms linking GenAI-driven personalisation to sustainable purchase intention, while incorporating anthropomorphism and ethical disclosure as contextual factors that influence these relationships. Together, these theoretical perspectives provide an appropriate foundation for examining how GenAI-driven personalisation shapes

Generation Z's sustainable purchasing behaviour. Figure 1 presents the proposed conceptual framework.

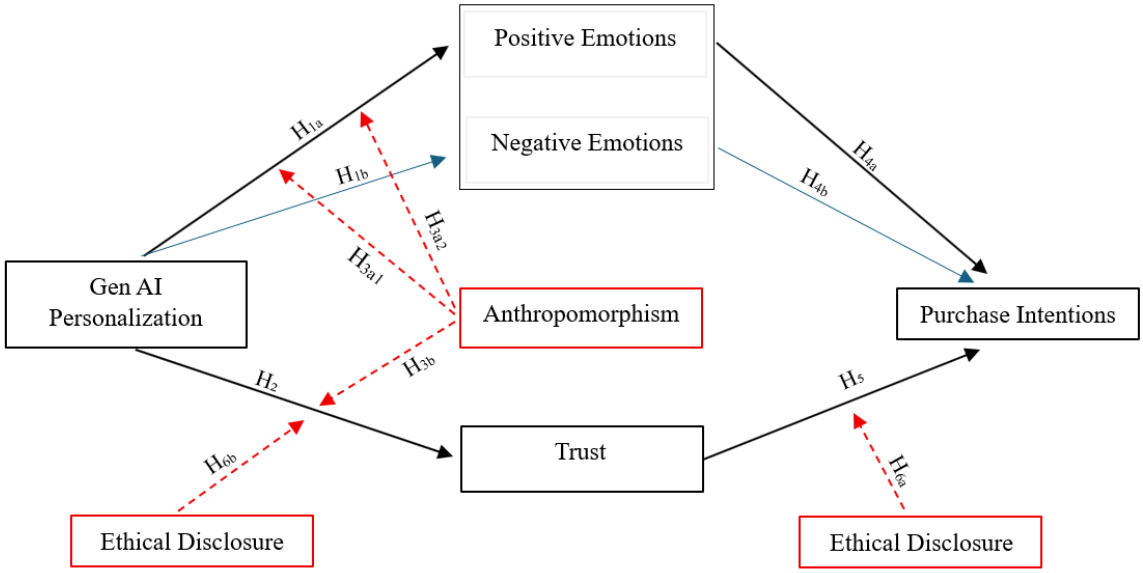


Figure 1. Proposed Conceptual Framework

Methodology

This study adopted a quantitative research design to examine the relationships between GenAI-driven personalisation, emotions, trust, anthropomorphism, ethical disclosure, and sustainable purchase intention among Gen Z consumers. A survey approach was employed to collect empirical data and test the proposed conceptual framework grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT).

Data Collection and Analysis

Data were collected through an online questionnaire administered to Gen Z consumers in Lebanon and Cyprus. Both countries were selected as underrepresented Mediterranean markets where Cyprus reflects rising AI adoption within the EU (Ionașcu, 2025), while Lebanon shows growing consumer demand for sustainable products (Darwish et al., 2025). Examining these contexts provides valuable insights into consumer responses to GenAI-driven personalisation beyond the

predominantly Western markets that dominate the existing literature. A total of 253 valid responses were obtained using purposive and convenience sampling techniques. The questionnaire employed measurement scales adapted to the context of GenAI-driven personalisation and sustainable consumption. The scales were subsequently assessed for their validity and reliability, and responses were measured using a five-point Likert scale. The collected data were analysed using IBM SPSS Statistics and Hayes PROCESS Macro to examine the direct, mediating, and moderating relationships among the study variables.

Findings and Discussion

The findings provide strong support for the proposed conceptual framework. GenAI-driven personalisation significantly enhances positive emotions and consumer trust while reducing negative emotions, confirming its central role in shaping Generation Z's sustainable purchase intention. Positive emotions and trust positively influence sustainable purchase intention, whereas negative emotions have a negative effect. Furthermore, anthropomorphism strengthens the relationships between GenAI-driven personalisation, emotions, and trust, demonstrating that human-like AI interactions enhance consumers' emotional engagement and confidence in AI-enabled recommendations. Ethical disclosure strengthens the relationship between trust and sustainable purchase intention; however, its moderating effect on the relationship between GenAI-driven personalisation and trust was not supported. Overall, the findings demonstrate that psychological and ethical factors are essential for understanding how GenAI-driven personalisation translates into sustainable purchase intention among Generation Z consumers. Table 1 summarises the hypothesis testing results.

Hypothesis	Relationship	Outcome
H1a	Personalisation → Positive Emotions	Supported
H1b	Personalisation → Negative Emotions	Supported
H2	Personalisation → Trust	Supported
H3a1	Anthropomorphism × Personalisation → Positive Emotions	Supported
H3a2	Anthropomorphism × Personalisation → Negative Emotions	Supported
H3b	Anthropomorphism × Personalisation → Trust	Supported

H4a	Positive Emotions → Purchase Intention (Full Mediation)	Supported
H4b	Negative Emotions → Purchase Intention (Full Mediation)	Supported
H5	Trust → Purchase Intention (Partial Mediation)	Supported
H6a	Ethical Disclosure × Trust → Purchase Intention	Supported
H6b	Ethical Disclosure × Personalisation → Trust	Not Supported

Table 1. Summary of the results

Originality and Value

This study contributes to the AI marketing literature in three ways. First, it extends UTAUT by integrating psychological (emotions and trust) and ethical (ethical disclosure) mechanisms into a single framework that explains sustainable purchase intention in the context of GenAI-driven personalisation. Second, it responds to the growing need to understand AI-enabled marketing from a sustainability perspective by examining sustainable purchase intention rather than general purchase intention. Third, it provides empirical evidence from Lebanon and Cyprus, contributing insights from two underrepresented Mediterranean markets to the international AI marketing literature.

Theoretical and Practical Implications

The study broadens the application of UTAUT by showing that consumer responses to GenAI are shaped not only by technology acceptance but also by emotional and ethical considerations. The results suggest that marketers should design AI-powered personalisation strategies that combine transparent disclosure with human-like interactions to foster trust, strengthen positive consumer experiences, and support sustainable purchasing decisions among Generation Z.

Research Limitations and Future Research

The study has several limitations. The study relies on cross-sectional survey data collected from Generation Z consumers in Lebanon and Cyprus, which may limit the generalisability of the results to other populations and contexts. Future studies could validate the proposed framework using longitudinal or experimental designs, examine additional cultural settings and age groups, and

explore how emerging forms of GenAI influence other consumer outcomes related to sustainability and responsible consumption.

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SUSTAINABILITY REPORTING AND DELISTING: MULTIPLE CASE STUDY THROUGH THE LENS OF INSTITUTIONAL THEORY

Lamusta, Simona; Iazzi, Antonio; Scorrano, Paola; Maizza, Amedeo
Department of Economic Sciences, University of Salento, Lecce, Italy

Keywords: Sustainability Reporting, Delisting, ESG, Legitimacy Theory, Isomorphism

Introduction

This study investigates the sustainability reporting practices after the delisting of a sample of companies from the Italian stock exchange in 2024 (Borsa Italiana, 2026), positioning within the emerging debate on the relationship between ESG Environmental, Social and Governance (ESG) performance and capital market logics. The Italian context is relevant as combines a European regulatory environment characterised by increasing sustainability disclosure obligations with a capital-market setting in which delisting may reduce or transform the coercive pressures associated with public listing.

Purpose, Aim and Objectives

Recent literature suggests that ESG characteristics are increasingly associated with firms' likelihood of remaining listed, but few studies explore post-delisting strategic trajectories.
Building on this debate, this study aims to examine post-delisting reporting continuity through the lens of institutional theory, conceptualizing how sustainability reporting could evolve from regulatory compliance to an embedded organizational practice.
The following research questions guide the empirical analysis:
RQ1. To what extent do companies delisted from the Italian stock exchange in 2024 continue to disclose sustainability information after delisting?
RQ2. How do the content, scope, and stakeholder orientation of sustainability reporting change after delisting?
RQ3. Which institutional mechanisms help explain the persistence, adaptation, or discontinuation of sustainability reporting once listing-related coercive pressures are reduced?

Literature Review and Theoretical Framework

In recent years, sustainability reporting has shifted from a voluntary practice to an institutionalized requirement, particularly in European capital markets (Talha, 2026). Regulatory interventions have contributed to increasing the amount of disclosed information but also raised concerns about firms' underlying motivations and quality of reporting practices (Talbot and Boiral, 2018). Sustainability reporting is shaped by the interplay of market and corporate dynamics, regulatory pressures, transparency demand, and stakeholder expectations (Mahmood and Uddin, 2020).

A growing body of literature has started to explore the relationship between ESG profiles and firms' capital market dynamics, including listing and delisting events. ESG performance may influence firms' ability to remain listed, as higher sustainability engagement is associated with greater capital market resilience and legitimacy (Liao *et al.*, 2024). Conversely, evidence suggests that firms operating in carbon-intensive industries have not shown an increased propensity to delist, even during periods characterized by heightened stakeholder concern over climate risks (Billio *et al.*, 2025).

Within this context, the emerging nexus between ESG and firms' delisting represents an insightful perspective for understanding the drivers of sustainability reporting.

Therefore, the present study aims to interpret this phenomenon through the lens of institutional theory (Zucker, 1987), focusing on the transition from coercive to normative isomorphism (Dimaggio and Powell, 1983).

Regulatory frameworks and industry norms have contributed to the rapid diffusion of reporting standards (Oliveira and da Silva, 2026), often resulting in a high degree of homogeneity among organizations within the same field (Carungu *et al.*, 2020). However, prior studies show that regulatory compliance and mandatory regimes do not necessarily ensure substantive sustainability engagement (Benedetti et al., 2026).

Methodology and Methods

This study adopts a qualitative multiple case study approach (Yin, 2014) and intends to explore the decision-making processes, the perceived role of sustainability reporting in delisted companies' strategy, and the extent to which such practices are embedded within the organizational culture under the lens of the institutional theory. The initial empirical sample is

constructed from the 2024 section of Italian stock exchange delisting document. This section reports twenty-nine numbered Italian issuer revocation events for 2024.

The analysis is based on secondary data deriving from different sources (Yin, 2012), including companies' sustainability reports and publicly available communications to explore the perceived role of sustainability reporting in delisted companies' strategy.

The company is the primary unit of analysis, and the delisting event anchors the comparison between pre- and post-delisting disclosure practices. Data will be analysed through qualitative content and thematic analysis in four stages. First, a case chronology will record each company's delisting date, stated motive, market segment, publicly available ownership or transaction context, and sustainability-reporting history. The analysis will then assess whether disclosure continues through standalone reports, other corporate documents, parent-company reporting, or ceases after delisting. Documents will subsequently be coded deductively through coercive, normative, and mimetic pressures and inductively for themes such as stakeholder accountability, legitimacy, group integration, strategic continuity, and transparency. Finally, cases will be compared to identify convergence and divergence across delisting motives and reporting trajectories.

Expected Findings, Contribution and Originality

Some of the sampled delisted companies continue to prepare sustainability reports, thus indicating a shift in institutional drivers, from coercive pressures before delisting to normatively driven practices aimed at maintaining stakeholder relationships.

The contribution of the study is threefold. First, it advances ESG and delisting literature by shifting attention from ESG as a potential antecedent of market survival to the strategic and institutional trajectories that follow market exit. Second, it extends institutional theory by examining how isomorphic mechanisms change over time: coercive pressures may initiate reporting practices while normative pressures may explain their persistence after the formal listing obligation has weakened. Third, this research aims to bridge the gap between compliance-driven and normatively driven perspectives on ESG reporting, suggesting that meaningful engagement with sustainability may emerge when organizations internalize reporting norms.

Research Limitations

The study acknowledges an important limitation as relies on secondary data, thus not keeping direct managerial intentions in reporting choices.

Theoretical and Practical Applications and Implications

From a theoretical and practical perspective, the expected findings contribute to the debate on the institutional theory and ESG performance by illustrating how normative mechanisms uphold organizational practices in the absence of coercive pressures and suggest that internalized reporting preserves transparency after delisting.
For policymakers, the results highlight that regulatory frameworks play a pivotal role in initiating change, but the long-term effectiveness of sustainability reporting may depend on its integration into organizational routines.

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Extending Cities' Sustainability Governance to Smart and Sustainable Islands: An Integrated Smart Territory Framework

Ntoumi, Anastasia[1]; Doumi, Maria[2]; Angelis, Vasilis[1], Kutsikos, Konstadinos[1]

[1]Department of Business Administration, University of the Aegean, Chios, Greece

[2]Department of Tourism Economics and Management, University of the Aegean, Chios, Greece

Keywords: Sustainability Governance, Smart Cities, Smart and Sustainable Islands, Sustainable Development Goals (SDGs).

Introduction

Sustainability transitions have become a central priority in territorial development, particularly in the context of climate change and digital transformation. Smart governance has emerged as a key mechanism for aligning technological innovation with sustainability objectives, especially in urban environments (Grossi et al., 2024; Anthopoulos, et al., 2023). Smart cities are increasingly understood as integrated systems combining digital technologies, data-driven decision-making and multi-level governance structures to enhance sustainability and quality of life.

At the same time, island territories face distinct sustainability challenges, including geographic isolation, limited resources and high vulnerability to climate change (European Commission, 2020; IRENA, 2023). Recent policy initiatives, such as the Clean Energy for EU Islands programme, highlight the need for governance models that integrate energy transition, local participation and multi-level coordination.

Despite these developments, the literature on smart cities and smart islands has largely evolved separately, creating a gap in understanding how governance frameworks can be adapted across different territorial contexts (Mora et al., 2019). While recent studies highlight the importance of integrated governance approaches, limited attention has

been given to how governance frameworks can be systematically transferred and adapted across fundamentally different territorial contexts such as cities and islands.

Purpose

The purpose of the present study is to explore how the governance framework created for cities can be adapted to smart and sustainable islands, adding to a broader conceptual perspective of sustainable territorial development. Additionally, the study adopts a conceptual research approach based on the literature on sustainability governance, urban governance and territorial development. The analysis builds upon theoretical contributions related to governance for sustainable development (Meuleman, 2018), multilevel governance systems (UN-Habitat, 2022) and territorial competitiveness (Kotler et al., 1999).

Literature Review

The study builds on the literature on sustainability governance, urban governance and territorial development, which emphasises the role of institutional coordination and policy integration in achieving sustainable outcomes (Meuleman, 2018; UN-Habitat, 2022). The conceptualisation of cities as open territorial systems transforming inputs into socio-economic outcomes is supported by earlier work on cities' sustainability governance, which underlines the transformation of human, natural, financial and social resources into outputs such as liveability, investibility and visitability, shaping overall stakeholder wellbeing (Angelis and Dimaki, 2011; Kotler et al., 1999). This systems-based perspective provides a foundational basis for understanding how governance mechanisms influence territorial performance Within this context, smart city research highlights how digital technologies, data-driven decision-making and multi-level governance structures contribute to improving urban sustainability and quality of life (Grossi et al., 2024; Anthopoulos et al., 2023).

At the same time, the emerging literature on smart and sustainable islands focuses on structural constraints such as geographic isolation, limited resources and climate vulnerability, while emphasising the importance of energy transition, resilience and local stakeholder engagement (European Commission, 2020; IRENA, 2023). These

approaches underline the need for governance models that are adaptable to different territorial conditions.

To strengthen the theoretical grounding, the analysis also draws on sustainability transitions literature, which conceptualises territorial change as a systemic and multi-level process, and on innovation systems theory, which highlights the role of collaboration, knowledge exchange and institutional capacity in shaping development trajectories (Geels et al., 2023; Trippl et al., 2024).

Despite these contributions, the literature on smart cities and smart islands has largely evolved separately, leading to a fragmented understanding of how governance mechanisms operate across different territorial contexts (Grossi et al., 2024; Mora et al., 2019). This fragmentation reveals a research gap in the integration of governance frameworks that can be applied across both urban and island territories within a unified analytical perspective.

Methodology

This study adopts a conceptual and theory-building research approach, aiming to synthesise and extend existing literature rather than conduct empirical testing. The methodological position is grounded in qualitative conceptual analysis, drawing on established theoretical frameworks in sustainability governance, urban governance and territorial development. The analysis is based on a structured review and integration of key contributions related to governance for sustainable development (Meuleman, 2018), multilevel governance systems (UN-Habitat, 2022) and territorial competitiveness (Kotler et al., 1999), complemented by more recent literature on smart governance, sustainability transitions and innovation systems (Grossi *et al.,* 2024; Geels et al., 2023; Anthopoulos et al., 2023; Trippl et al., 2024). This integrative approach enables the identification of common governance mechanisms and their adaptation across different territorial contexts.

The research follows a framework development process, which includes: (a) the identification of core governance dimensions from the literature, (b) the conceptual integration of these dimensions into a unified analytical model, and (c) the alignment of governance mechanisms with key innovation drivers and territorial outcomes.

In this context, the proposed Smart Territory Governance Model is developed as an analytical tool that links governance pillars (policy development, organizational development, multi-stakeholder collaboration and multi-level cooperation) with processes such as digital transformation, energy transition and circular economy practices. As a conceptual study, the methodology does not include primary data collection or empirical validation. However, the framework is designed to be operationalisable and testable, allowing future research to apply it through comparative case studies, indicator-based assessments and mixed-method approaches across urban and island settings.

Findings

This approach builds on the conceptualisation of cities as open systems performing a transformation process from inputs to outputs, where governance mechanisms play a central role in shaping territorial outcomes (Angelis and Dimaki, 2011). The proposed framework conceives cities and islands as open territorial systems that transform available resources into socio-economic and environmental outcomes that affect the well-being of stakeholders. Consequently, sustainability governance functions as the institutional mechanism that coordinates development strategies and local policies with global sustainability goals, such as the SDGs. The framework is structured around the four pillars of the Sustainable Cities Governance model: policy development, organizational development, multi-stakeholder collaboration and multi-level cooperation (Ntoumi et al., 2025; Meuleman, 2018). To capture the active interaction between governance processes, innovation drivers and territorial outcomes, the study proposes a conceptual Smart Territories Governance Model that combines both smart cities and smart islands within a common sustainability governance ecosystem.

The study indicates that both cities and island territories can be understood as territorial systems that convert available resources into outputs influencing the wellbeing of their stakeholders. These outputs include economic vitality, environmental sustainability and social wellbeing, as well as dimensions such as liveability, investibility and visitability that contribute to territorial attractiveness (Kotler et al., 1999).

However, important differences exist between the governance environments of cities and islands. Cities operate complex governance systems defined by wide institutional

actors, broad infrastructure networks and diversified economic sectors. Sustainability governance in cities therefore focuses on coordinating policies across sectors such as mobility, housing, energy systems and digital services (Caragliu et al., 2011). Island territories, on the other hand, encounter systemic limitations related to geographic isolation, limited resource supply and vulnerability to climate change. Many islands remain dependent on imported fossil fuels and tourism-based economic activities. As a result, sustainability strategies in island contexts frequently prioritize renewable energy deployment, climate resilience and sustainable resource management (IRENA, 2020).

Despite these differences, the analysis shows that both territorial systems rely on similar governance mechanisms to achieve sustainability transitions. Organizational development strengthens the administrative capacities of local authorities to implement sustainability policies effectively. Multi-actor collaboration promotes stakeholder engagement among governments, businesses, academic institutions and civil society organisations, often through quadruple helix innovation partnerships. Finally, multi-level cooperation guarantees coordination across different governance levels and facilitates access to financial resources and policy support (UN-Habitat, 2022). Within the proposed Smart Territory Governance Model, these governance mechanisms interact with innovation drivers such as digital transformation, renewable energy transition, circular economical practices and smart tourism strategies. These drivers accelerate sustainability transitions in both urban and island environments and contribute to the generation of sustainability outcomes.

To demonstrate the practical applicability of the proposed model, an illustrative example can be drawn from initiatives such as the Clean Energy for EU Islands programme. In this context, policy development is reflected in local energy transition strategies aligned with EU targets, while organizational development is evident in strengthened local administrative capacities. Communities holder collaboration is implemented through partnerships among public authorities, energy providers and local communities, and multi-level cooperation is demonstrated through coordination with national and EU institutions. These mechanisms interact with innovation drivers such as renewable energy deployment, contributing to improved liveability through enhanced energy security, increased investibility via green investment attraction, and strengthened visitability through more sustainable tourism practices.

Originality

The study adds to the literature by connecting the concepts of smart cities and smart islands within an integrated sustainability governance framework. While previous research has often analyzed these territorial systems separately, the proposed Smart Territory Governance Model shows that both operate within interconnected governance ecosystems that support sustainability transitions. By extending the Cities' Sustainability Governance framework to island territories, the study provides a new conceptual perspective for the analysis of smart territories as integrated socio-economic systems supporting to the implementation of the Sustainable Development Goals.

Limitations

This study has several limitations. First, as a conceptual and theory-building contribution, the proposed Smart Territory Governance Model has not been empirically validated and requires testing in different territorial contexts. Second, the model may have limited applicability in very small or highly dependent island territories, where institutional capacity and governance resources are constrained.

Finally, the effectiveness of the framework depends on external factors, including multilevel governance coordination and access to financial resources. Future research should therefore focus on empirical validation through comparative case studies and indicator-based assessments.

Practical Implications

The proposed framework delivers useful insights for policy makers, local governments and regional development organisations seeking to promote sustainable territorial development. For cities, the model supports the design of integrated urban strategies combining digital innovation, sustainable infrastructure and community governance mechanisms. For island territories, it shows the importance of energy transition strategies, community involvement and partnership with European sustainability initiatives such as the Smart Islands Initiative and the Clean Energy for EU Islands programme.

Social Implications

In addition, island territories may function as living laboratories for sustainability innovation, where new governance models and technological solutions can be tested at smaller scales before being applied to larger urban systems (IRENA, 2020). The proposed framework therefore illustrates how governance mechanisms can support sustainability transitions in both urban and island territories.

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DIGITAL NUDGING IN SUSTAINABLE FASHION IN E-COMMERCE

Langaro, Daniela[1]; Pesserico, Rebeca[1]; Bigne, Enrique[2]

[1]Instituto Universitário de Lisboa (ISCTE-IUL), Business Research Unit (BRU-IUL), Lisboa, Portugal

[2]Faculty of Economics, University of Valencia, Valencia, Spain

Keywords: Digital nudging; Sustainable fashion; Purchase intention; Price salience; E-commerce design; Product perceptions

ABSTRACT

The fashion industry is increasingly moving to expand its portfolio of sustainable goods. Consumers, however, often fail to decide on sustainable offers while making their purchases. This study examines whether digital nudges embedded in e-commerce interfaces can increase intentions to purchase sustainable fashion. We compare three nudge types, disclosure, feedback, and social, and test whether their effects operate through functional, symbolic, and hedonic perceptions. Two scenario-based quantitative studies were conducted and analyzed using PLS-SEM (SmartPLS). In Study 1 (n = 161), disclosure and feedback nudges increased purchase intention compared to the no-nudge scenario, whereas the social nudge was not significant. In Study 2 (n = 266), nudges were tested against priced purchase intention, and all three nudges showed significant direct effects. Mediation analyses indicated significant indirect effects through functional and symbolic perceptions, while hedonic perceptions did not mediate the relationships. Findings offer guidance on which nudges are most effective in sustainable fashion e-commerce and explain the psychological pathways through which they operate.

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GOVERNANCE, ENTREPRENEURSHIP AND LOCAL COLLABORATION AS DRIVERS OF SUSTAINABLE AND RESILIENT TOURISM DEVELOPMENT IN THE MEDITERRANEAN

Koutsouradi, Myrsinia[1]; Vellios, Ioannis[1]; Doumi , Maria [1]; Angelis, Vasilis [2]

[1]Department of Tourism Economics and Management, University of the Aegean, Chios, Greece

[2]Department of Business Administration, University of the Aegean, Chios, Greece

Keywords

Sustainable tourism development, resilience, governance, tourism entrepreneurship, small and medium-sized enterprises, stakeholders collaboration, Mediterranean

Introduction

Tourism is a major contributor to both the economic and social growth of the Mediterranean region, but at the same time, it leads to considerable changes and pressures on natural ecosystems, local communities, and the infrastructure of destinations, thus creating a highly complex Mediterranean tourism framework. Issues such as over-tourism, climate change, and scarcity of natural resources not only highlight the drawbacks of the current development model but also make the change to more sustainable and resilient forms of tourism development an absolute necessity.

Within this framework, sustainability and resilience are seen as two sides of the same coin, a fact that demands not only environmental conservation but also the provision of appropriate governance structures, maintenance of social unity, and economic flexibility (Ntoumi et al., 2025). Especially in the Mediterranean region, these principles are largely put into practice through collaboration between the public and private sectors and the presence of local tourism entrepreneurship.

Purpose

The purpose of this study is the investigation of the role of multi-level governance, tourism entrepreneurship, with a particular emphasis on small and medium-sized enterprises (SMEs), and collaboration between public and private stakeholders in shaping sustainable and resilient tourism destinations in the Mediterranean. The research seeks to highlight how the interaction of these three pillars develops a high complexity resolution mechanism which can address complex challenges such as overtourism, environmental degradation, and the climate crisis, and identify critical policy elements for the long-term balance of destinations and their sustainable and resilient tourism development (Figure 1).

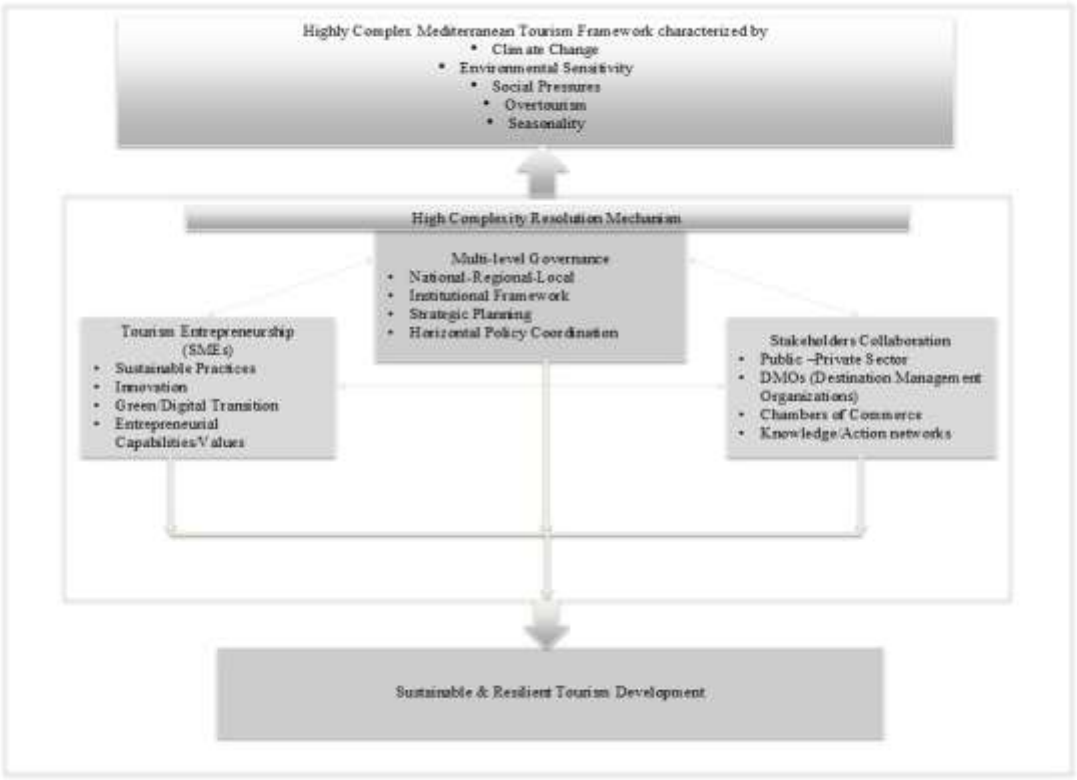


Figure 1: The Highly-Complex Mediterranean Tourism Framework and the way to address it

Literature Review

Sustainability in tourism refers to a continuous operation that utilizes natural resources without depletion. It also aims at preserving the socio-cultural coherence and well-being of people, providing decent work opportunities, and promoting institutional organization so as to minimize negative impacts. Sustainability does not refer only to the environment but rather to the whole transformation that involves changes in laws, incentives, and business models, especially in places like the insular and coastal areas of the Mediterranean where there is a concentration of tourism (Mangion et al., 2025).On the other hand, resilience in tourism reflects how well a tourism system can handle major disruptions such as pandemics or extreme weather phenomena without only returning to the previous state but possibly even moving to a better one through processes of redesign and transformation. Most recent research considers sustainability and resilience as complementary yet distinct concepts: while sustainability is about maintaining a state of balance over time, resilience is more concerned with the ability to respond to and manage crises (Mandić et al., 2025).It is argued that destinations have to combine both concepts if they are to succeed in an unpredictable global environment (Gaki and Koufodontis, 2022).

Mediterranean areas have been and still are among the most intensively exploited places worldwide in terms of tourism development as they combine a high level of tourism attractiveness with very fragile coastal and marine ecosystems. The fast growth of tourism has resulted in serious environmental, social, and economic pressures such as the overuse of natural resources, loss of biodiversity, pollution, changes in land use, and coastal erosion. Besides that, situations like over-tourism and uncontrolled urbanization do not only lower the quality of life of locals but also harm the cultural identity of the tourism destinations (Mejjad et al., 2022).

Tourism governance in the Mediterranean is marked by fragmented authority, poor inter-sectoral collaboration, and failure in integrating environmental factors in development planning. Tools such as the DPSIR framework (Drivers, Pressures, State, Impacts, Responses) and sustainability indicators serve for monitoring and evaluating the effects of tourism development but they cannot alone lead to a genuine transition towards sustainability.

Hence, the introduction of a multi-level and flexible governance approach is a must which not only recognizes strategic planning, policy implementation, and stakeholder involvement as separate components but also combines them to strike a balance between economic growth, environmental protection, and ensuring resilience of Mediterranean tourism destinations in the long term (Mejjad et al., 2022).

Tourism entrepreneurship in the Mediterranean involves to a great extent the local and regional development since the sector is largely dependent on the small and medium-sized enterprises that determine the identity and level of quality of tourism destinations. Nevertheless, the latest research shows that entrepreneurial impact on sustainable tourism development is not direct and guaranteed; rather, it mainly hinges on its involvement in collaborative structures and collective governance mechanisms (Farsari, 2023).

According to the latest research, collaboration-based forms of entrepreneurship can result in meaningful and permanent outcomes when they are part of multi-level governance systems. With such arrangements, national and regional strategy and policy-making set the scene and provide incentives, while local stakeholders and businesses are able to plan and execute actions that best suit their specific circumstances. In this way, the entrepreneurship role shifts from being just an economic activity to becoming a collective instrument of sustainable development, thereby enhancing the competitiveness and the long-term equilibrium of tourism in the Mediterranean (Crabolu et al., 2023).

To sum up, shifting to sustainable and resilient tourism models in the Mediterranean area requires building collaborative ecosystems where entrepreneurship and institutional governance serve as two interrelated and fundamental drivers of sustainability and resilience.

Methodology

The study adopts a qualitative approach, based on a systematic literature review of international academic research and selected policy documents related to sustainable and resilient tourism development in the Mediterranean (Farsari, 2023; Mejjad et al., 2022). It is complemented by a comparative examination of good practices and cases of public–private collaboration in countries such as Spain (Barcelona, Costa Brava, Mallorca),Italy (Matera),Greece(Sifnos)and Cyprus (Pavón et al., 2018; Serra et al., 2017). Particular emphasis is placed on the role of Destination Management Organizations (DMOs) and Chambers of Commerce as intermediary bodies for policy implementation and SMEs support. The literature review followed distinct stages: (a) identification of keywords and thematic axes related to governance, tourism entrepreneurship, SMEs, and stakeholder collaboration; (b) search for academic articles and policy reports in international databases; (c) evaluation and selection of sources based on relevance and scientific quality; and (d) synthesis of findings aimed at identifying common patterns and theoretical convergences.

Findings

The findings indicate that sustainable and resilient tourism development in the Mediterranean cannot be achieved through fragmented interventions. Effective governance requires coordination across national, regional, and local levels, as well as horizontal collaboration across policy sectors (Farsari, 2023; Mejjad et al., 2022). SMEs constitute the “backbone” of Mediterranean tourism and the primary mechanism for translating sustainability into everyday practices; however, they face constraints related to resources, know-how, and access to finance (OECD, 2025; Baiocco et al., 2023). Stakeholder collaboration and public–private partnerships enhance legitimacy, reduce conflicts, and improve policy implementation, particularly in environmentally sensitive destinations (Alexopoulos et al., 2025; Alverti et al., 2026).

Originality

This paper contributes to the literature by integrating the concepts of sustainability, resilience, and governance complexity in Mediterranean tourism. It highlights the complementary role of governance, entrepreneurship, and collaboration as an integrated system rather than as isolated factors, offering a comprehensive analytical framework useful for both researchers and policymakers.

Limitations

The study relies mainly on literature analysis, which limits the generalization of the findings across all Mediterranean contexts. Future research could incorporate primary data (e.g. interviews, field surveys) to provide a deeper understanding of the collaboration mechanisms and entrepreneurial incentives.

Practical Implications

The results suggest that public authorities should enhance multi-level governance arrangements and actively support SMEs in the transition towards green and digital business models. DMOs and Chambers of Commerce can act as critical hubs for knowledge dissemination, training, and networking, facilitating the local-level implementation of sustainable practices (Mandić et al., 2025; Kritikos et al., 2025).

Social Implications

Strengthening collaboration and participatory governance contributes to improved social cohesion, reduced tensions with local communities, and a fairer distribution of tourism benefits. At the same time, it helps protect cultural identity and residents' quality of life in overcrowded destinations (Vagena, 2021; Donaire et al., 2024).

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FOUNDATIONAL FRAMEWORKS FOR AUTONOMOUS AGENTS IN BUSINESS PROCESS MANAGEMENT

De Queiroz, Hermano Jorge[1]

1Department of Information Technology, Lindsey Wilson College, Columbia, USA

Keywords: autonomous agents, business process management, multi-agent systems, agent negotiation, distributed systems, intelligent automation, hybrid control models, agentic AI origins

Introduction

The conceptual groundwork for autonomous AI agents in business was established in the 1990s and early 2000s, yet contemporary agentic AI literature largely treats autonomous business agents as a recent phenomenon, overlooking the intellectual lineage that shaped their design principles. Understanding the foundational frameworks of 1992–2002 allows researchers to distinguish genuine innovations in modern agentic AI from rediscoveries of earlier ideas, and to identify which challenges—coordination, negotiation, trust, task decomposition—remain unresolved. This study examines the foundational decade during which key frameworks for autonomous agent-based business process management were established, providing the conceptual genealogy that contextualizes today's AI-driven business transformation.

Purpose, Aim and Objectives

This study traces the intellectual origins of autonomous agent frameworks in business process management during 1992–2002. Three objectives guide the research: (1) mapping early architectural and theoretical models introducing autonomous agents into business environments; (2) analyzing the evolution from single-agent infrastructures to multi-agent negotiation and coordination frameworks; and (3) demonstrating how this foundational body of work prefigures the autonomy, task decomposition, and orchestration principles of contemporary agentic AI.

Literature Review and Theoretical Framework

Early hybrid control models introduced self-reliant autonomous agents operating without centralized coordination (Hadavi, 1992). The ADEPT project operationalized these principles through negotiating, service-providing agents handling discrete business tasks (Jennings et al., 1995; 1996). Theoretical frameworks emerged for delegating process components to

coordinating agents (Jennings et al., 1999), while formal models addressed computational negotiation for task distribution (Faratin, 1997). Fuzzy-genetic approaches decomposed complex economic systems into autonomous agent sets (Aliev and Fazlollahi, 2002). By 2002, the field had converged on interactive autonomous agents as a core AI pursuit (Alonso, 2002). Critically, these foundational principles—autonomy, negotiation, task decomposition, and distributed coordination are structurally identical to those defining modern agentic AI, including LLM-based agents and multi-agent orchestration systems. The gap is not the existence of historical work, but the absence of a structured bridge connecting this lineage to current developments.

Methodology and Methods

A historical literature review is employed, analysing seminal publications from 1992–2002 across Scopus, IEEE Xplore, and ACM Digital Library. This approach is deliberately chosen over a systematic literature review because the objective is genealogical: to trace intellectual lineage and conceptual continuities, not survey current output. Thematic analysis maps key developments—agent architecture, negotiation models, coordination mechanisms—and their trajectories toward contemporary agentic AI design.

Main Findings and Contribution

Findings reveal a clear evolutionary arc from isolated autonomous agents to multi-agent systems capable of negotiation and coordinated service delivery. Three contributions emerge: (1) a conceptual genealogy mapping 1992–2002 frameworks to modern autonomy, orchestration, and task decomposition principles; (2) identification of persistent unresolved challenges—interoperability, trust, value alignment—recurring across three decades; and (3) a comparative analysis demonstrating that contemporary agentic AI, including LLM-based orchestration platforms, are architectural descendants of ADEPT-era frameworks, not conceptual departures.

Originality and Value

By tracing the 1992–2002 foundations, this study equips researchers to evaluate the genuine novelty of modern agentic AI and offers practitioners a conceptual vocabulary grounded in accumulated insight—a perspective largely absent from current literature.

Research Limitations

As a historical review bounded to 1992–2002 and three English-language databases, the study does not survey post-2002 developments in depth. The genealogical approach prioritizes conceptual lineage over empirical breadth.

Theoretical and Practical Applications and Implications

For researchers, the genealogy reveals that agent coordination and trust challenges have remained structurally consistent across generations, suggesting contemporary governance frameworks can draw on prior theoretical work. For practitioners, recognizing that modern agentic AI architectures inherit known failure modes from multi-agent systems—coordination breakdowns, goal misalignment—enables more informed risk assessment and governance design.

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AI AGENTS AND AGENTIC AI FOR BUSINESS PROCESS AUTOMATION AND AUGMENTATION IN SMEs

Vasilopoulou, Eirini[1]**; Farmakis, Timoleon**[1]

[1]Athens University of Economics and Business, Athens, Greece

Keywords: AI Agents, Agentic AI, AI Automation, RAG, SMEs, Digital Transformation, DSR, Business Process Transformation

Purpose and Research Questions

The rapid evolution of AI automations and Agentic AI architectures creates new opportunities for business process automation and augmentation, yet their implementation in real businesses, and in SMEs in particular, remains underexplored: although generative AI lowers technological entry barriers, SMEs struggle to convert availability into measurable value (OECD, 2025). This study designs, implements, and evaluates a role-based Agentic AI system enhanced with Retrieval-Augmented Generation (RAG) within a real automotive-retail SME. It asks how such an architecture can be designed to automate and augment data-intensive managerial sub-processes (RQ1); how the system performs against measurable quality constructs (RQ2); and in what sense the agents act as digital role assistants that augment rather than replace managerial authority (RQ3).

Theoretical Background

The study sits at the intersection of digital and AI transformation and emerging generative-AI architectures. Agentic AI extends RAG's grounding logic (Lewis et al., 2020) with autonomy, planning, and adaptive control (Acharya et al., 2025), while the augmentation perspective positions AI as a cognitive collaborator that supports, rather than substitutes, managers (Davenport and Kirby, 2016). Empirical work operationalising role-based agents inside organisational functions, particularly in SMEs, remains scarce.

Methodology

A Design Science Research process (Peffers et al., 2007) guided problem identification, objective definition, design and development, demonstration, evaluation, and communication. The setting is a medium-sized Greek used-car retailer (approximately 70 employees; over 5,000 asset transactions annually) with data fragmented across ERP, CRM, spreadsheets, and analytics platforms. Interviews, on-site observation, and workshops with the Sales, Marketing, Finance, and Administration managers produced role-based process maps (21, 35, 19, and 19 sub-processes respectively), from which data-intensive sub-processes were selected. The

artifact, built on the n8n workflow-automation platform, comprises four role-based AI agents coordinated by a central orchestration agent, integrating enterprise data through APIs and grounding responses via RAG.

Findings

In a two-week pilot, the company's managers used the system in real operational scenarios; 20 consecutive operational prompts were scored against retrieved enterprise data as ground truth, using KPIs for agentic systems grounded in Sunkara (2024). Precision reached 72.5%, the hallucination rate was 22.5%, and first-time resolution and task completion rates both reached 65%. Per-agent analysis shows that performance tracks underlying data quality: the Marketing and Finance agents performed best; the Sales agent was hindered by semi-structured source data; the Administration agent, running on demonstration data, performed weakest. Overall, the system reduced reporting time and managerial cognitive load, automating tasks that previously required manual cross-system aggregation, while managers retained decision authority.

Originality and Value

The study moves the Agentic AI literature beyond conceptual discussion to an empirical, utility-demonstrated instantiation in an SME, extends RAG into a coordinated multi-agent enterprise system, and contributes a KPI framework spanning human–AI interaction, business impact, and model quality.

Practical Implications

Agentic AI does not require large infrastructural investment: modular, API-based, role-based design lets SMEs leverage existing digital assets at minimal cost. The reported process maps and KPI set offer practitioners a blueprint for moving from pilot to operational deployment.

Research Limitations

Findings rest on a single retail SME, a short pilot, single-rater scoring, one base language model, and partly demonstration data; multi-case, longitudinal research and model benchmarking are needed.

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I AM IN LOVE WITH MY AI

Schinzel, Ursula
Faculty of Business, Unicaf University, Larnaka, Cyprus

Keywords: Artificial Intelligence (AI), AI Chatbots, Online Dating, Digital Intimacy

Introduction

Artificial intelligence (AI) is increasingly transforming human relationships, particularly within digital and online dating environments. The emergence of AI chatbots as romantic companions reflects broader societal shifts toward digital intimacy, raising significant psychological, social, and ethical concerns. This study examines the growing relevance of AI-mediated relationships in the context of loneliness, trust, and changing relational norms.

Purpose, Aim and Objectives

This study investigates why individuals engage in romantic relationships with AI chatbots. It aims to identify key motivations, perceived benefits, and associated risks. The research explores how AI-mediated intimacy influences emotional attachment, trust, and expectations within contemporary digital relationships.

Literature Review and Theoretical Framework

Online dating platforms are shaped by impression management and selective self-presentation, often involving misrepresentation (Ellison et al., 2006; Markowitz & Hancock, 2018). Truth-Default Theory explains individuals' tendency to assume honesty despite deception risks (Levine, 2014). These dynamics may reduce trust and emotional security, encouraging users to seek predictable alternatives such as AI companions. Broader theoretical perspectives on alienation and meaning (Nietzsche, 2006) further contextualize this shift, while cultural frameworks (Hofstede, 2011; House et al., 2004) highlight the influence of societal norms.

Methodology and Methods

A mixed-methods approach was employed, combining a literature review with interviews conducted between 2021 and 2026. The sample includes 350 online daters and 45 individuals

reporting emotional or romantic engagement with AI chatbots. Snowball sampling enabled access to participants with experience of AI-mediated relationships.

Findings and Contribution

Findings indicate that loneliness, dissatisfaction with human relationships, and distrust in online dating are key drivers of AI engagement. Participants report emotional attachment to AI companions due to their availability, responsiveness and empathy. AI chatbots provide a nonjudgmental environment for self-expression and support. The study contributes to understanding how AI navigates between intimacy and companionship versus alienation (Ciriello et al, 2025).

Originality and Value

This research identifies AI-mediated romantic engagement as an emerging form of relationship that addresses compassion, suicide and humanising AI (Ciriello & Chen, 2024). By integrating psychological, sociological, and technological perspectives, it contributes to debates on digital intimacy, human–AI interaction and online dating (Schinzel, 2024, 2022). The findings provide an assessment of opportunities and risks and suggest directions for future research.

Research Limitations

The study is limited by the evolution of AI technologies, which constrains longitudinal analysis. Cultural and regional differences are not explored, limiting generalisability. Additionally, reliance on self-reported data may introduce bias, including selective disclosure and social desirability effects.

Theoretical and Practical Applications and Implications

The findings extend theoretical understanding of emotional attachment to artificial agents and human–technology interaction. Practically, they highlight the need for responsible AI development, including transparency, governance, and user protection on online dating apps through responsible AI-matchmaking (Agrawal, 2021). Ensuring that AI enhances rather than replaces human relationships is critical for digital innovation in the companionship/alienation dialectic.

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UNDERSTANDING THE IMPACT OF AI USAGE ON STARTUP FOUNDER WELL-BEING: DIRECT AND INDIRECT EFFECTS

Bužavaitė Monika[1*]; Kazlauskaitė Rūta[2];

[1,2]Department of Management, ISM University of Management and Economics, Vilnius, Lithuania

Keywords: Entrepreneurship, Well-being, Artificial intelligence, Startup, Quantitative research, Survey, Lithuania

Introduction and Objectives

Notably, startup founders often face burnout due to a lack of resources, high expectations, and negative emotions that might lead to reduced well-being (Ross et al., 2021). Therefore, this study intends to incorporate a unique approach to the well-being of startup founders by investigating the conducive and adverse effects of AI technologies on startup founder well-being and identifying mediating and moderating factors in this linkage. Since number of studies contradicts how AI usage, positively or negatively, impacts leader well-being in the context of startups (Bessen et al., 2023; Nurjannah et al., 2023; Arboh et al., 2025; Filippelli et al., 2026).

Literature Review and Theoretical Framework

Entrepreneurs' well-being can be explained through job demands- resources, self- efficacy, stress, and entrepreneurship models and theories (Barbosa et al., 2024); however, it is still unclear how AI affects entrepreneur well-being – do AI tools serve as a resource or demand, does it heighten or lower stress, etc. Besides the majority of entrepreneurial well-being studies have analyzed how social entrepreneurship is related to well-being, which calls for research in other types of startups. Accordingly, to understand the mechanism of the AI effects on entrepreneur well-being, this research will be grounded with job demands- resources theory, in combination with other theories such as paradox and will be conducted in the context of technological startups.

Methodology and Methods

A quantitative study approach applied by conducting a survey of Lithuanian startup founders. Lithuania was selected as the research context due to its growing startup ecosystem and increasing adoption of digital technologies (EC, 2026). The targeted sample of the survey was 290. Data collection has been ongoing since April, and is expected to provide sufficient data for analysis, enabling the presentation of preliminary findings at the conference in September. The analytical approach will involve descriptive and inferential statistical analyses to examine the relationships among the study variables.

Main/Expected Findings and Contribution

Our study consolidates previous scientific explorations of AI usage affects on well-being and extends it by offering empirical findings from a study in the context of startup founders. Its multi-dimensional model suggests possible diverse paths (positive – via e.g. self-efficacy and competence, and negative – via e.g. techno-stress, resource insufficiency) of AI adoption effects on well-being, by combining job resource demand theory with complementary theories and determining the mechanism (direct and indirect effects) of this relationship. It also explores the boundary effects of workplace environment factors in the relationship between AI usage and startup founders' well-being.

Originality and Value / Theoretical and Practical Applications/Implications

The conducted study contributes to entrepreneurship research by offering insights on AI usage effects on entrepreneurial well-being and provides suggestions on its enhancement, a necessary condition of innovative leadership, which in turn affects overall startup performance (Barbosa et al., 2024).

Identified factors mediating and moderating the relationship between AI usage and well-being at founders level in startups were grouped by its enabling and constraining effects, bringing more awareness to startup founders to seek well-being gains appearing in AI driven innovation process.

According to presented results, policy makers should be more focused on financial support oriented to new technologies and innovations, which would help to reduce techno-stress appearing in AI usage process and leading to better well-being.

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FROM KEYBOARD TO THE AIRPORT: DIGITAL SEARCH BEHAVIOR AND TOURISM DEMAND FORECASTING IN CRETE

Vasileiou Evangelos[1] and Papavasileiou Emmanouil[2]

[1] Department of Accounting & Finance, Hellenic Mediterranean University, Heraklion, Greece

[2] Department of Business Administration & Tourism, Hellenic Mediterranean University, Heraklion, Greece

Keywords: Tourism demand; forecasting, Greece, SARIMAX

Extended Abstract

Purpose: This study investigates whether online search behaviour can be utilized to forecast tourist arrivals to Crete. The analysis focuses on the three dominant inbound tourism markets: Germany, the United Kingdom, and France. Tourism-related search queries were collected from Google Trends for the period 2015–2024. These data capture users' online search activity associated with travel planning and destination interest, serving as a proxy for future tourism demand.

Literature Review: Crete is one of the most popular tourist destinations in Greece, attracting more than five million visitors annually (INSETE, 2026). Accurate forecasting of tourist arrivals is crucial for both private tourism enterprises and public authorities, as it underpins strategic planning, facilitates efficient resource allocation, and supports informed operational decision-making (Wu et al., 2025). Tourism businesses rely on demand forecasts for staff scheduling, renovation planning, pricing strategies, and investment decisions, whereas public institutions require reliable estimates to effectively manage infrastructure, water resources, transportation systems, and sanitation services (Kumar and Ekka, 2026).

Traditional tourism forecasting approaches primarily rely on historical arrival data and macroeconomic indicators (Zhang et al., 2025). However, the rapid digitalization of travel planning has created new opportunities to leverage online behavioural data as leading indicators of tourism demand. In this context, Google Trends provides real-time insights into the intentions and interests of potential travellers before actual arrivals occur (Agan et al., 2026).

Methodology: Given the large number of correlated search terms, Principal Component Analysis (PCA) was employed to reduce dimensionality and extract the

underlying latent structure of tourism interest in each country. PCA allows for the identification of key components that summarize the common variation among search queries while minimizing information loss (Zhang et al., 2025). These components were subsequently incorporated as exogenous variables into a Seasonal Autoregressive Integrated Moving Average with Exogenous Variables (SARIMAX) model.

The SARIMAX methodology was selected due to the pronounced seasonality of tourism demand (Brida et al., 2026), particularly in island destinations such as Crete. By integrating seasonal patterns with external predictors derived from Google Trends, the model captures both temporal dynamics and shifts in online travel interest. The analysis further examines the time lag between increases in online search activity and actual tourist arrivals, identifying the periods during which search intensity translates into realized demand.

Main findings: The empirical results indicate that Google Trends variables possess statistically significant predictive power for forecasting tourist arrivals to Crete. In particular, increases in tourism-related searches from Germany, the United Kingdom, and France consistently precede actual arrivals by several months, with variations depending on the origin market and season. The incorporation of PCA-derived components enhances model stability and mitigates multicollinearity, while the SARIMAX framework effectively captures recurring seasonal fluctuations.

Contributions: The proposed framework demonstrates the value of integrating digital behavioural indicators with advanced time-series techniques for tourism forecasting. The findings contribute to the growing body of literature on data-driven tourism analytics (see Mikulić and Baumgärtner, 2025) and highlight the practical relevance of search engine data for destination management (see Chen et al., 2025). From a managerial perspective, tourism enterprises can utilize these forecasts to optimize staffing levels, manage capacity, schedule renovations, and inform expansion decisions. Concurrently, public authorities can improve planning related to infrastructure, waste management, transportation systems, and water supply during peak tourism periods.

Originality and value: This study provides evidence that online search activity can serve as an early indicator of tourism demand and offers a practical forecasting framework for highly seasonal destinations such as Crete. Future research could extend this approach by incorporating additional origin markets, alternative digital indicators such as social media data or airline metrics, and advanced machine learning techniques to further enhance predictive performance.

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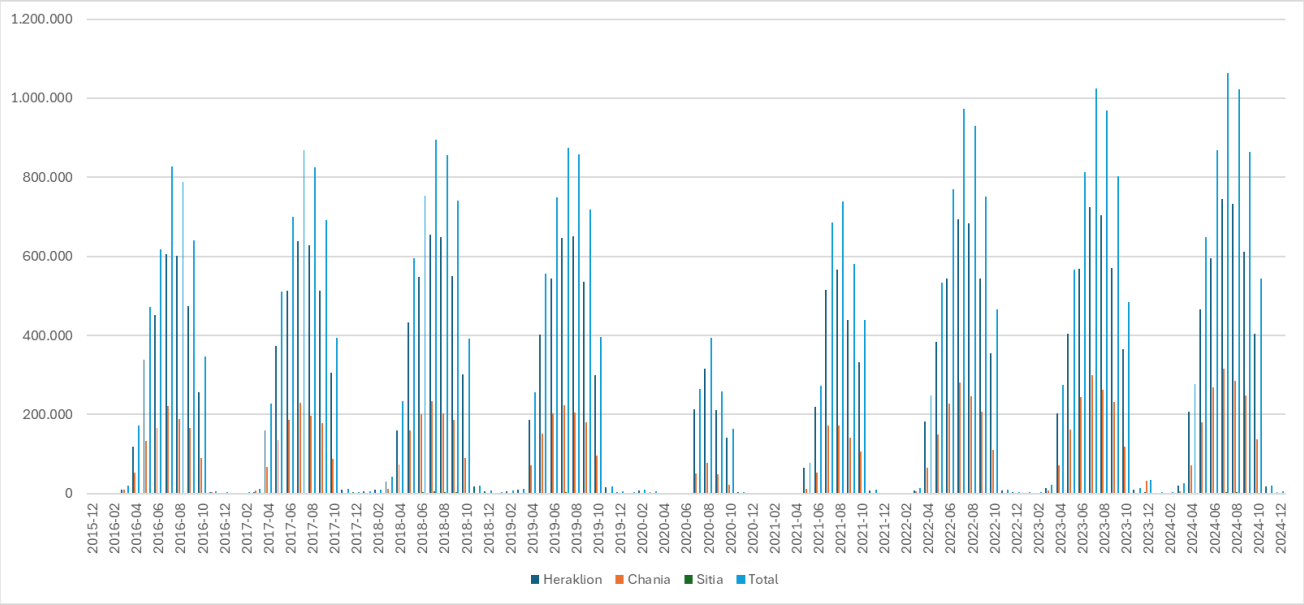
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Figure 1: International Arrivals at Cretan airports



Reimagining Rural Cyprus through Digital Storytelling: Heritage, Place Identity and Sustainable Tourism

Liasidou, Sotiroula[1]; Garanti, Zanete[2]

[1] Department of Hospitality and Tourism Management, Cyprus University of Technology, Paphos, Cyprus

[2] Faculty of Economics and Social Development, Latvia University of Life Sciences and Technologies, Jelgava, Latvia

Abstract

Digital platforms increasingly influence how destinations communicate their identity and transform cultural resources into meaningful tourism experiences. Focusing on Cyprus's *Heartland of Legends* initiative, this study explores how an official tourism platform digitally frames rural culture and creates alternative representations of the destination. A qualitative content and discourse analysis examines the interplay between storytelling, imagery, mythology, local traditions, gastronomy and representations of rural landscapes. The analysis reveals a digitally constructed image of inland Cyprus centred on authenticity, cultural continuity and experiential engagement, offering a counter-narrative to the island's established coastal tourism identity. At the same time, the selective presentation of heritage raises questions concerning idealisation and the representation of living culture. The study extends discussions of digital place-making by showing how culturally embedded narratives can simultaneously support destination differentiation, encourage tourism dispersal and enhance the visibility of rural communities. It argues that digital storytelling can contribute to more sustainable destination development when technological communication remains connected to local identity, cultural complexity and community participation**.**

Keywords: Digital place-making; digital storytelling; cultural heritage; rural tourism; destination identity; sustainable tourism; Cyprus

1. Introduction

Digital media have become central to the construction and circulation of tourism destination images, functioning as key sites where cultural meaning, place identity, and branding strategies converge (Petrovski et al., 2025; Garanti et al., 2024; Xue, 2022). This paper examines the cultural representation of tourism destinations through a qualitative content analysis of Heartland of Legends (https://heartlandoflegends.com/), the official promotional website dedicated to the cultural and natural heritage of the central region of Cyprus, Troodos

Mountain. The purpose is to understand how narratives, visual imagery, and thematic structures are mobilised to construct a distinctive sense of place and communicate cultural identity to prospective visitors (Tousi et al., 2025; Najafi et al., 2024). Theoretically, the discussion draws on interdisciplinary perspectives from cultural tourism, destination image formation, and place branding (Liasidou, 2026,et al., 2024; Xue, 2022): cultural tourism theory foregrounds the role of heritage, symbolism, and meaning-making in shaping tourist experiences; destination image frameworks emphasise the cognitive and affective dimensions through which destinations are perceived and evaluated (Zhang et al., 2023); and place branding scholarship shows how cultural narratives are selectively curated to align with policy objectives and market positioning (Zhang et al., 2023).

Recent scholarship has recognised official tourism websites as important instruments of digital place-making through which destinations communicate identity, construct destination images, and shape visitors' expectations before travel. Through the selective use of narratives, visual imagery, and symbolic representations, digital tourism platforms do not merely provide information but actively participate in the production of place meanings and cultural interpretations (Rol & Sert, 2023). Destination branding strategies commonly draw on cultural heritage, authenticity, local traditions, and historical narratives to differentiate destinations in a competitive tourism environment (De Man, 2025). At the same time, scholars have raised concerns about the ways tourism representations simplify, idealise, or selectively construct cultural identities: destination marketing materials often privilege particular versions of heritage and authenticity while marginalising alternative cultural narratives and contemporary social realities (Xue, 2022). Such representations can shape how tourists perceive destinations and contribute to broader processes of cultural commodification and symbolic place construction.

Few studies have examined closely how official tourism websites construct and communicate cultural identity (Ramadani et al., 2025), a gap that is especially pronounced for small island destinations undergoing tourism diversification and repositioning. Much of the existing literature centres on destination branding outcomes, visitor perceptions, or sustainable place branding, with comparatively little written about the narrative and visual mechanisms behind how cultural meaning is actually produced and communicated in digital tourism environments (Garanti et al., 2024; Liasidou, 2018). The official "Heartland of Legends" tourism website offers a case well suited to this question. As an example of digital place-making and cultural representation in Cyprus, it allows for a close qualitative reading, through its textual narratives, visual imagery, and symbolic elements, of how cultural heritage, local identity, and place meaning are constructed in digital tourism communication, and of how far these representations move Cyprus beyond its traditional mass-tourism image.

The paper proceeds as follows. The next section examines digital influence and sustainability in the contemporary tourism environment, before turning to destination place-making and the digitalisation of cultural heritage, with particular attention to how digital technologies shape destination identity and cultural representation. The methods section then outlines the qualitative research approach and analytical framework. The findings section presents and analyses the results, and the paper closes with a discussion of the main findings, its limitations, and recommendations for future research and sustainable tourism development.

2. Digital influence and sustainability

The rapid expansion of the global tourism industry, driven by low-cost air travel, digital connectivity, and greater international mobility, has transformed how destinations are promoted, experienced, and consumed (Hajiyeva, 2026). Contemporary tourists are no longer satisfied with standardised mass tourism products; they seek authentic, immersive, and

experience-oriented forms of travel instead. As tourism demand evolves, many destinations that once relied on mass tourism models have reached stages of saturation and stagnation, so destination competitiveness now depends on innovation, differentiation, and the ability to construct distinctive destination identities that respond to changing market expectations. Digital technologies have assumed a central role in this shift, functioning as tools for destination branding and tourism promotion (Najafi et al., 2024). Websites, social media platforms, and digital storytelling mechanisms serve as instruments of "digital place-making", enabling destinations to construct, communicate, and reinforce particular spatial identities and cultural narratives: the process through which places are represented, interpreted, and experienced through digital environments, shaping both tourists' perceptions and destination image formation. Through visual imagery, textual narratives, multimedia content, and symbolic representations, tourism websites shape how destinations are imagined and understood by potential visitors (Batubara, 2025).

Cultural heritage has meanwhile emerged as a significant component of sustainable tourism development and destination differentiation (Vrettakis et al., 2019). Tourists are drawn to destinations offering cultural authenticity, local identity, heritage experiences, and meaningful engagement with place, and many destinations have accordingly tried to move away from conventional mass tourism models built around the "3Ss" (sun, sea, and sand) towards more diversified, culturally oriented tourism products (Garanti, 2022). Cyprus is a particularly relevant case in this regard given its historical dependence on mass coastal tourism: the island was long promoted internationally as a Mediterranean destination defined mainly by favourable climate, beaches, and leisure. Growing market competition, changing tourist preferences, and sustainability concerns have since highlighted the need for destination repositioning and diversification, with cultural heritage, authenticity, and

experiential tourism increasingly seen as mechanisms for enhancing competitiveness while supporting economic, social, and environmental sustainability.

3. Destination Place-Making and the Digitalisation of Cultural Heritage

The concept of the tourism destination has long been regarded as the central component and the core tourism product of the overall tourism experience. A destination functions as the platform upon which the tourism experience is constructed and consumed, integrating economic, social, cultural, and environmental dimensions, which is why public and private sectors alike need to coordinate tourism-related activities to stimulate tourist interest before travel, shape decision-making, and support meaningful experiences during a visitor's stay. Destinations today operate within an increasingly competitive marketplace, where sophisticated marketing and place-branding strategies construct idealised images through visual representations and symbolic narratives (Eshuis & Ripoll González, 2024). Such representations aim to captivate tourists' imaginations, offering a temporary escape from the pressures of contemporary urban life and stimulating travel demand.

Digital place-making has emerged as a significant interdisciplinary concept linking tourism development, cultural heritage, digital transformation, and sustainable destination management. Destinations increasingly draw on digital technologies, storytelling mechanisms, and participatory communication platforms to construct meaningful, immersive representations of place capable of shaping tourist perceptions and destination experiences. Basaraba (2023) describes digital place-making as combining narrative, technology, and cultural heritage to construct emotionally engaging, experience-oriented destination identities that allow destinations to reposition themselves through digitally mediated representations emphasising authenticity, local identity, and cultural continuity.

Digital place-making also contributes to sustainable tourism development through participatory engagement, co-creation, and digitally enhanced visitor experiences. Morrison (2022) argues that it strengthens cultural heritage interpretation and social inclusion through interactive digital environments that improve user experience and community identity, while Samir (2019) shows that placemaking supports cultural tourism development by preserving heritage assets, strengthening destination identity, and deepening visitor engagement within culturally significant spaces.

Recent scholarship connects digital place-making to smart tourism and sustainable urban development. Tousi et al. (2025), for instance, propose that integrating cultural heritage, digitalisation, and community participation supports inclusive place-making strategies capable of strengthening cultural sustainability and destination resilience, while Fricano (2025) highlights how smart technologies, augmented reality, interactive platforms, and digital storytelling transform cultural heritage management and visitor engagement by creating immersive, accessible tourism experiences (Nosratabadi et al., 2023).

Digital communication and social media also shape tourist behaviour and sustainable consumption patterns. Rosário et al. (2025) argue that digital marketing platforms influence sustainable consumer behaviour by promoting environmental awareness and ethical decision-making; Kelmendi (2025) shows that social media communication, digital storytelling, and influencer engagement affect tourist perceptions and support sustainable tourism preferences; and Sigala (2022) notes that digital technologies shape tourist behaviour before, during, and after travel by influencing destination selection, engagement, and post-travel evaluation.

Within Cyprus, the “Heartland of Legends” initiative illustrates this strategic mechanism at work. Through the integration of mythology, folklore, gastronomy, rural traditions, and immersive storytelling, the platform constructs a distinctive cultural identity that promotes

inland tourism, local entrepreneurship, and heritage preservation, showing how digital storytelling and technological innovation can support sustainable tourism development by strengthening local communities, preserving intangible cultural heritage, and promoting authentic, experience-oriented tourism practices.

This challenge is especially significant in island economies, where tourism is often a primary source of economic development given limited alternative resources; uncontrolled growth in such contexts has frequently resulted in environmental pressure and socio-cultural change, reinforcing the case for strategic tourism planning, product diversification, and reduced reliance on mass tourism. The broader shift toward post-Fordist consumption patterns has reinforced this trajectory: as tourists increasingly seek individualised, experience-oriented forms of travel over standardised mass-tourism products, culture has become a pillar of sustainable tourism development, and the digitisation of cultural heritage has opened new opportunities for visitor engagement, accessibility, preservation, and interpretation (Liasidou, 2022).

Technology, in particular, has become a critical factor influencing destination selection and tourist behaviour: digital platforms, social media, virtual representations, and online cultural content shape tourists' perceptions and expectations well before travel, while the visual and digital presentation of cultural heritage through websites, virtual tours, mobile applications, and multimedia content strengthens both destination attractiveness and competitiveness. Culture, technology, and sustainability are therefore best understood as interconnected pillars for destinations seeking to build competitive, resilient tourism strategies.

4. Methods of the study

Within this broader strategic framework, digital tourism platforms play a crucial role in constructing and communicating new destination identities. The “Heartland of Legends” tourism website is an important example of digital place-making in Cyprus: it promotes the island’s cultural heritage, mythology, traditions, and rural identity through digitally mediated narratives and representations, positioning Cyprus not merely as a coastal tourism destination but as a culturally rich, experience-oriented destination shaped by history, legend, local tradition, and heritage landscapes.

The paper’s central aim is therefore to examine how the “Heartland of Legends” website represents cultural identity and heritage, and the extent to which it contributes to digital place-making and destination repositioning beyond Cyprus’s traditional “3Ss” tourism image. Specifically, it investigates how digital narratives, visual content, and cultural representations are used to construct an authentic destination identity, enhance destination branding, promote visitor engagement, and support the diversification of Cyprus’s tourism product beyond the mass tourism model, evaluating the website’s contribution to communicating rural identity, local traditions, mythology, gastronomy, and cultural landscapes, and its role in fostering sustainable tourism practices and enriching the tourist experience.

The study is guided by the following research questions:

RQ1: How does the *Heartland of Legends* tourism website represent the cultural heritage and rural identity of Cyprus through its digital content?

RQ2: In what ways does the website employ digital place-making strategies to create an authentic and distinctive destination identity?

RQ3: How are local traditions, mythology, gastronomy, landscapes, and cultural experiences integrated into the website's digital storytelling and destination branding?

RQ4: To what extent does the website promote the principles of sustainable tourism, including cultural preservation, community participation, and tourism diversification?

Methodologically, the study adopts a qualitative approach combining content analysis and discourse analysis to examine the digital representation of cultural heritage and destination identity on the "Heartland of Legends" website. The analysis focuses on textual narratives, visual imagery, symbolic representations, and multimedia content that contribute to the construction of Cyprus' cultural and tourism identity within the digital environment, using Infranodus to examine both textual and visual material. This approach enables the identification of recurring motifs, thematic patterns, dominant discourses, and representational strategies that underpin the construction of the destination image (Basaraba, 2023; Morrison, 2022).

Discourse analysis is used, in turn, to explore critically how language, narratives, symbolism, and visual communication are used to construct particular understandings of place, heritage, authenticity, and cultural identity. It examines how tourism narratives frame Cyprus as a culturally authentic, experience-oriented, and sustainable destination, while identifying the ideological assumptions, selective representations, and symbolic meanings embedded within the digital storytelling process, with particular attention to how concepts such as tradition, mythology, rurality, local community, sustainability, and destination branding are discursively constructed and communicated to prospective visitors (Garanti et al., 2024; Tousi et al., 2025).

The analysis focuses on narrative themes, aesthetic choices, linguistic structures, symbolic references, and visual representations related to culture, history, landscape, and community, allowing for an interpretive exploration of how cultural meaning is framed, mediated, and reproduced in a digital tourism context. It evaluates the extent to which the platform supports

digital place-making, promotes authentic and immersive cultural experiences, strengthens destination branding, and contributes to sustainable tourism development through the integration of technology, storytelling, heritage preservation, and community participation, building on evidence that sustainable place branding and digitally mediated tourism experiences positively influence destination image, visitor trust, emotional engagement, and destination loyalty (Garanti et al., 2024).

Taken together, this methodological approach is designed to surface the broader implications of cultural tourism, digital innovation, and discourse construction for destination competitiveness, cultural representation, and long-term tourism sustainability, showing how digital place-making strategies allow destinations to use technology and cultural narratives not only to reach markets but to construct socially meaningful, sustainable, experience-oriented destination identities (Morrison, 2022; Basaraba, 2023).

5. Tourism in Cyprus

Tourism is one of the most significant sectors of the Cypriot economy and has long served as a fundamental driver of economic growth, employment, and regional development. Its strategic location in the Eastern Mediterranean, favourable climate, extensive coastline, and rich cultural heritage have made Cyprus an important international tourism destination that attracts millions of visitors annually. The island combines natural beauty, historical heritage, cultural diversity, and hospitality, offering a multidimensional tourism experience that appeals to a wide range of tourist segments.

Tourism development in Cyprus accelerated rapidly after the 1970s, mainly through the promotion of the “3S” tourism model based on sun, sea, and sand. Coastal areas such as Ayia Napa, Protaras, Limassol, Paphos, and Larnaca became major tourism hubs, attracting

predominantly European tourists, particularly from the United Kingdom, Scandinavia, Germany, and Russia. The tourism industry contributed substantially to the island's economic transformation, generating foreign exchange revenue, employment, infrastructure development, and investment growth (Boukas, 2025).

The rapid expansion of tourism also brought environmental, social, and economic challenges. The concentration of tourism activity in coastal regions led to environmental degradation, urban overdevelopment, pressure on natural resources, seasonality, and dependence on mass tourism models, while the standardisation of tourism products reduced destination differentiation and increased vulnerability to international tourism fluctuations and external crises. These developments underlined the need for strategic tourism planning and sustainable management, prompting Cyprus to shift gradually toward tourism diversification, with growing emphasis on alternative forms such as cultural tourism, religious tourism, rural tourism, wine tourism, nature-based tourism, sports tourism, and wellness tourism (Garanti, 2022). This transformation seeks to reduce dependence on mass tourism while enhancing destination competitiveness and promoting year-round activity.

Cultural and heritage tourism have become important components of Cyprus' tourism strategy. The island's rich historical and cultural legacy, shaped by Greek, Roman, Byzantine, Venetian, Ottoman, and British influences, is reflected in archaeological sites, UNESCO World Heritage monuments, Byzantine churches, monasteries, museums, and traditional villages that contribute substantially to its tourism attractiveness, while religious tourism has grown alongside the island's strong Orthodox Christian heritage and religious landmarks. Technology and digital transformation are playing a growing role in this evolution: tourism stakeholders are turning to digital marketing, smart tourism technologies, online booking systems, mobile applications, virtual experiences, and social media platforms

to enhance destination visibility and visitor engagement, and the emergence of the "digital tourist" has changed tourism consumption patterns, requiring destinations to adopt innovative technological solutions to remain competitive in the global market.

Sustainability has, in turn, become a central pillar of tourism policy and development in Cyprus. Tourism authorities increasingly recognise the importance of balancing economic growth with environmental protection, cultural preservation, and social wellbeing, and sustainable tourism strategies aim to protect natural ecosystems, preserve cultural heritage, strengthen local communities, and improve the quality of the tourism experience. Tourism in Cyprus is thus continuing to evolve from a predominantly mass tourism destination toward a more diversified, sustainable, and experience-oriented model capable of addressing contemporary trends and future development challenges (Socratous et al., 2025).

6. Results – Heartland of Legends – website content

The qualitative content and discourse analysis of the *Heartland of Legends* tourism website identified four overarching themes that directly address the study's research questions: (1) Representation of Cultural Heritage and Rural Identity; (2) Digital Place-Making and Destination Identity; (3) Digital Storytelling, Cultural Experiences and Destination Branding; and (4) Sustainable Tourism Development through Community Participation and Tourism Diversification. These themes demonstrate that the platform operates not merely as a promotional website but as a digital place-making mechanism through which cultural heritage, local identity, storytelling, and sustainability are integrated to reposition Cyprus' rural heartland as an authentic, experience-oriented destination (Basaraba, 2023; Socratous et al., 2025).

Theme 1: Representation of Cultural Heritage and Rural Identity

The first theme illustrates how the *Heartland of Legends* website digitally represents the cultural heritage and rural identity of Cyprus. Rather than promoting isolated attractions, the platform constructs a coherent cultural landscape where villages, monuments, mythology, religious heritage, gastronomy, handicrafts, traditional architecture, and natural environments collectively communicate a distinctive rural identity. Heritage is presented as a living cultural resource that continues to shape local communities rather than as a collection of static monuments. The website places considerable emphasis on everyday traditions, agricultural practices, local craftsmanship, religious customs, and village life, encouraging visitors to engage directly with authentic aspects of Cypriot culture.

This representation aligns closely with contemporary theories of digital place-making, which argue that digital platforms increasingly shape visitors' perceptions of destinations by constructing meaningful cultural narratives rather than simply providing information (Basaraba, 2023). Through the integration of tangible and intangible heritage, the platform contributes to preserving local identity while simultaneously enhancing the visibility of Cyprus' rural regions within the tourism market.

The analysis further indicates that the platform's experiential architecture is central to its place-making function. Official content repeatedly invites visitors to 'follow a story' and organises experiences around themes such as olive oil, honey, bread, weaving and water. This thematic organisation converts products and practices that might otherwise appear as isolated attractions into narrative entry points to place. The effect is to foreground sensory participation and cultural learning, thereby presenting rural Cyprus as something to be encountered through practices, people and stories rather than simply observed. This is consistent with the broader Heartland route, which official tourism material describes through

participatory activities including traditional crafts, local food production and village-based experiences (Cyprus Deputy Ministry of Tourism, 2025).

Theme 2: Digital Place-Making and Destination Identity

The second theme demonstrates how the website employs digital place-making strategies to create an authentic and distinctive destination identity. The analysis indicates that *Heartland of Legends* actively constructs meaning through storytelling, visual imagery, interactive navigation, thematic routes, multimedia content, and experiential narratives. Instead of presenting destinations geographically, the website organises tourism experiences around stories, transforming physical locations into places rich in cultural significance and emotional meaning.

The "Follow a Story" concept functions as the principal place-making mechanism, connecting landscapes, historical sites, mythology, gastronomy, religious heritage, and local traditions into coherent visitor journeys. Such digital storytelling creates emotional engagement while simultaneously reinforcing authenticity and destination memorability (Liasidou, 2026). As Basaraba (2023) suggests, digital place-making enables destinations to communicate cultural meaning and identity through narrative experiences rather than traditional destination promotion. The findings further demonstrate that the website successfully repositions Cyprus beyond its long-established "sun, sea and sand" tourism image by constructing an alternative destination identity centred on authenticity, cultural immersion, and experiential tourism. This strategic repositioning reflects contemporary destination branding approaches that emphasise unique cultural assets as sources of competitive advantage (Socratous et al., 2025).

Theme 3: Digital Storytelling, Cultural Experiences and Destination Branding

The third theme highlights the central role of digital storytelling in integrating local traditions, mythology, gastronomy, landscapes, and cultural experiences into destination branding. Throughout the website, stories function as the primary communication mechanism through which visitors discover the cultural identity of rural Cyprus. Rather than describing attractions individually, the platform links diverse tourism resources into coherent narratives that communicate authenticity, symbolism, and cultural significance. Local gastronomy is prominently featured through narratives surrounding traditional recipes, olive oil production, wine-making, beekeeping, local food festivals, and agricultural practices. Likewise, mythology and folklore are embedded within visitor routes, allowing tourists to experience cultural landscapes through legendary narratives that reinforce the symbolic identity of each village and region. Traditional crafts, religious heritage, village festivals, local workshops, and rural lifestyles further enrich the storytelling process by connecting visitors with everyday community life. This narrative structure contributes significantly to destination branding by presenting Cyprus as a destination "full of legends and stories." Rather than competing through conventional tourism products, the website differentiates the destination through cultural expression, authenticity, and heritage interpretation, supporting what Basaraba (2023) describes as experience-based destination branding founded upon local identity and cultural narratives.

A notable technological extension of this strategy is the Dragons of the Heartland discovery game. The Cyprus Deputy Ministry of Tourism describes the application as an augmented-reality experience connected with twenty village fountains, through which users encounter

digital dragons and short stories derived from Cypriot traditions, legends and distinctive local characteristics. The application illustrates how digital interpretation can connect intangible narratives with physical heritage locations while encouraging movement through inland villages (Cyprus Deputy Ministry of Tourism, 2025). Within the analytical framework of this study, the game therefore represents more than technological novelty: it exemplifies the integration of storytelling, spatial exploration and heritage interpretation that characterises the platform's digital place-making logic

Theme 4: Sustainable Tourism Development through Community Participation and Tourism Diversification

The fourth theme reveals that sustainability constitutes one of the website's most prominent underlying principles. Rather than treating sustainability solely as environmental protection, the platform adopts a multidimensional approach encompassing cultural preservation, local economic development, community participation, and tourism diversification. The initiative actively encourages visitors to explore villages, mountainous communities, and rural landscapes instead of concentrating tourism activity within traditional coastal destinations. This geographical redistribution contributes to regional economic development by connecting visitors with local accommodation providers, restaurants, wineries, artisans, workshops, agricultural producers, cultural events, and community enterprises. Consequently, tourism expenditure is distributed more evenly across rural communities, strengthening local entrepreneurship and contributing to the circular local economy.

Community participation emerges as another central dimension of sustainability. The website consistently highlights interactions between visitors and local residents through workshops,

cultural demonstrations, festivals, agricultural experiences, and traditional celebrations. Local communities are therefore presented not merely as tourism settings but as active participants in destination development, reinforcing both cultural vitality and social sustainability.These findings strongly reflect the principles proposed by Zhang et al. (2025), who argue that culturally oriented tourism districts contribute to sustainable destination development by simultaneously supporting cultural preservation, economic growth, community participation, visitor engagement, and destination competitiveness. The characteristics identified by Zhang et al.—including showcasing local artists, strengthening destination branding through cultural expression, establishing an authentic sense of community, creating clusters of tourism experiences, revitalising local economies, and developing hubs of cultural vitality—are all evident throughout the *Heartland of Legends* initiative.

Technology also plays a strategic role in supporting sustainability. The incorporation of multimedia storytelling, interactive visitor routes, digital event promotion, and augmented reality applications such as *Dragons of the Heartland* enhances visitor interpretation and engagement without requiring extensive physical infrastructure or environmental intervention. As a result, digital innovation facilitates sustainable tourism development by increasing accessibility to cultural heritage while reducing the need for resource-intensive tourism development. Finally, the initiative closely aligns with the principles of slow tourism by encouraging longer visitor stays, deeper cultural immersion, appreciation of local landscapes, and meaningful interaction with host communities. Rather than promoting high-volume visitor flows, the platform advocates low-impact, culturally driven tourism experiences that reinforce heritage conservation, local identity, and community wellbeing.

Overall, the thematic analysis demonstrates that the *Heartland of Legends* website functions as an integrated digital place-making ecosystem where cultural heritage, storytelling, technology, destination branding, and sustainability operate as mutually reinforcing

components. The findings indicate that digital place-making can successfully strengthen destination competitiveness while simultaneously preserving cultural identity, supporting local communities, diversifying tourism products, and promoting sustainable regional development. These results support previous research emphasising that cultural tourism initiatives should be viewed not merely as tourism attractions but as strategic instruments for sustainable destination management and long-term regional resilience (Basaraba, 2023; Socratous et al., 2025; Zhang et al., 2025).

The “Heartland of Legends” initiative demonstrates a strong connection between cultural tourism and sustainable tourism development by promoting alternative and experience-oriented forms of travel. Rather than concentrating tourism activity within traditional mass-tourism coastal destinations, the project encourages visitors to explore rural and mountainous areas of Cyprus through slow tourism experiences that emphasize cultural immersion, local interaction, and environmental appreciation. In this context, villages, local crafts, gastronomy, folklore, mythology, and everyday traditions become central tourism attractions, allowing visitors to engage with authentic aspects of local identity and cultural heritage. Such an approach supports the preservation of local culture by transforming heritage from a static element of display into a living and experiential component of the tourism experience. At the same time, the initiative contributes to the preservation and revitalization of cultural heritage by maintaining the relevance of stories, monuments, traditions, and intangible cultural practices through active visitor engagement. The project also strengthens the circular local economy, as tourism expenditure is distributed across small communities, local producers, workshops, accommodation providers, restaurants, and cultural events. Furthermore, the integration of digital technologies, including animation, multimedia storytelling, and augmented reality applications, enhances visitor engagement and destination interpretation

without requiring extensive physical development or environmental intervention. Consequently, the project illustrates how storytelling and technological innovation can redirect tourism toward inland cultural heritage and local communities, transforming sustainability from a purely promotional concept into a practical and experience-based tourism strategy.

Planning a cultural district begins with understanding the desired outcomes and establishing a sustainability formula for an optimum return on investment. For a district intending to attract tourists, the expected outcomes may include:

Presenting opportunities to showcase artists.
Enhancing a destination's brand through cultural expression.
Establishing an authentic "sense of community.
Providing venues and places for tourists to spend money.
Adding a cluster of new experiences to attract both tourists and residents.
Revitalizing commercial districts for economic growth cultivated through tourist spending.
Establishing new hubs of cultural vitality to market to tourists

Overall, the development of culturally oriented tourism districts contributes significantly to sustainable destination development by combining cultural preservation, economic growth, community participation, and visitor engagement. Such initiatives strengthen destination competitiveness while simultaneously promoting local identity, supporting small businesses, and enhancing the overall tourism experience (Zhang et al., 2025). Consequently, cultural districts should not be viewed solely as tourism attractions, but as strategic instruments for sustainable regional development, social cohesion, and the long-term preservation of cultural heritage within contemporary tourism economies.

7. Conclusion

The findings of this study demonstrate that digital tourism platforms increasingly function as strategic instruments of destination branding, cultural representation, and sustainable tourism development. The “Heartland of Legends” initiative illustrates how digital storytelling, cultural heritage, and technological innovation can be integrated to construct a distinctive destination identity that moves beyond the traditional mass tourism model historically associated with Cyprus. Through the use of mythology, folklore, gastronomy, rural traditions, and immersive cultural narratives, the platform contributes to the development of a more experience-oriented and culturally authentic tourism product capable of strengthening destination competitiveness and visitor engagement. The study further reveals that digital place-making significantly influences how destinations are perceived, interpreted, and consumed within the contemporary tourism environment.

The website strategically constructs an idealised representation of the Troodos region by emphasizing authenticity, heritage continuity, local identity, and community-based experiences. Such representations support tourism diversification and reinforce sustainable tourism objectives by redirecting tourism flows toward inland and rural areas, promoting local entrepreneurship, strengthening cultural preservation, and encouraging forms of slow and experiential tourism. In this regard, the initiative aligns with broader sustainable tourism principles that seek to balance economic development with cultural preservation, social cohesion, and environmental responsibility.

The practical implications extend to destination management and digital content governance. Tourism authorities should treat digital place-making as an ongoing curatorial process rather than a one-off promotional intervention. Content could be periodically reviewed with communities, cultural practitioners and local enterprises to ensure that representations remain accurate, inclusive and responsive to cultural change. Greater visibility could also be given to the people who maintain traditions, thereby shifting emphasis from heritage as a consumable image towards heritage as a living social practice. Such an approach would reinforce authenticity while reducing the risk that cultural narratives become detached from the communities from which they originate.

Future evaluation should also move beyond website content to test whether the intended place-making effects are realised in practice. Mixed-method research could combine web analytics, visitor surveys, interviews with residents and businesses, spatial visitation data and longitudinal assessment of participating communities. This would allow researchers to examine whether exposure to digital narratives changes destination image, whether technology-enabled experiences increase engagement with inland areas, and whether tourism expenditure reaches local enterprises. Comparative analysis with other Mediterranean island destinations would further clarify which aspects of the Heartland model are context-specific and which may be transferable to destinations seeking diversification through digitally mediated cultural tourism.

At the same time, the research highlights several critical dimensions associated with the digital representation of culture and heritage. While the platform successfully enhances emotional engagement and destination attractiveness, it also reflects processes of selective cultural representation and commodification. Local culture is primarily presented through romanticised and heritage-oriented narratives that privilege timelessness, tradition, and

authenticity, while more complex contemporary social realities remain less visible. Consequently, digital tourism communication not only promotes destinations but also shapes visitors' expectations and cultural interpretations prior to travel. This finding reinforces the importance of adopting more reflexive, inclusive, and culturally sensitive approaches to destination branding and digital tourism promotion.

Moreover, the study confirms the growing importance of technology in contemporary tourism development. Digital storytelling, interactive content, multimedia communication, and augmented reality applications contribute significantly to visitor engagement, accessibility, and destination visibility. The integration of digital technologies with cultural tourism experiences demonstrates how innovation can support sustainable tourism practices without requiring extensive physical development or environmental intervention. In this sense, the "Heartland of Legends" initiative represents an example of low-impact tourism innovation that enhances cultural interpretation while simultaneously supporting heritage preservation and local community participation.

Overall, the study contributes to the broader literature on sustainable tourism, digital tourism communication, destination image formation, and cultural place branding by conceptualising tourism websites as dynamic cultural texts that actively mediate place identity and visitor perception. The findings suggest that future tourism strategies should increasingly prioritise authenticity, cultural sustainability, community engagement, and digital innovation as interconnected dimensions of competitive destination development. Finally, further research could expand the analysis by examining tourists' perceptions and experiences directly, comparing digital representations across multiple destinations, or investigating the long-term impact of digital place-making on sustainable tourism development and cultural identity formation.

Despite its contributions, the study presents several limitations that should be acknowledged. The research focuses exclusively on the "Heartland of Legends" tourism website as a single case study and, therefore, the findings cannot be fully generalised to other tourism destinations or digital tourism platforms. In addition, the study adopts a qualitative methodological approach based on content and discourse analysis, which inevitably involves interpretive subjectivity. The research also concentrates primarily on the supply side of tourism communication by analysing website content without directly examining tourists' perceptions, experiences, or behavioural responses. Consequently, the actual impact of digital narratives on visitor satisfaction and destination choice cannot be fully evaluated. Furthermore, the dynamic nature of digital platforms means that website content and communication strategies may evolve over time, potentially influencing future interpretations. Finally, the study mainly examines English-language content and does not fully explore multilingual or cross-cultural dimensions of digital destination representation. Nevertheless, the research provides valuable insights into digital place-making, cultural heritage communication, and sustainable tourism development.

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BEHAVIORAL CUSTOMER ANALYTICS IN HOTEL MANAGEMENT: EVIDENCE FROM A LARGE-SCALE CRM DATASET

Vasileiadis, Georgios, Ismyrlis, Vasileios

Department of Tourism, Economics and Management, University of the Aegean, Chios, Greece

Keywords: Customer analytics, Hospitality management, CRM, Behavioral segmentation, Revenue management, Service operations, Cancellation risk

Abstract

The rapid expansion of large-scale customer relationship management (CRM) systems has reshaped how hospitality organizations monitor demand, manage service delivery, and optimize revenue under uncertainty. Contemporary hotels collect extensive behavioral data on booking frequency, length of stay, booking horizons, cancellations and no-shows, distribution channels, market segments, and spending patterns. Despite this availability, many managerial decisions in hotel operations continue to rely on simplified indicators of customer loyalty or static segmentation schemes, limiting effective use of customer intelligence in operational planning (Carneiro et al., 2023). This study addresses this gap by proposing an integrated behavioral customer analytics framework that supports evidence-based decision-making in hotel and tourism management.

The main aim of the study is to examine how behavioral customer data can inform key managerial functions in hospitality, including demand forecasting, revenue management, and customer relationship strategies. Three objectives are pursued: (i) identifying distinct behavioral customer segments based on transactional patterns, (ii) profiling customer value using interpretable (Recency Frequency Monetary value) RFM-style indicators aligned with hotel revenue logic and (iii) assessing behavioral risk through cancellation, no-show, and inactivity patterns. Together, these objectives promote a managerial perspective that treats customers as heterogeneous operational entities rather than homogeneous market groups (Ali and Shabn, 2024).

The study builds on the hospitality and tourism management literature on customer heterogeneity, service analytics, and revenue management. Prior research emphasizes that customer value in hospitality is multidimensional and shaped by economic contribution and behavioral reliability. Conceptually, the study integrates insights from service management theory, CRM in tourism and hospitality analytics, viewing hotel customers as dynamic behavioral portfolios characterized by evolving patterns of frequency, intensity, and temporal engagement. This framework reflects contemporary views of hotels as complex service systems in which customer behavior directly affects operational risk and revenue stability (Novicka, 2025).

Methodologically, the analysis is based on a CRM-style dataset comprising approximately 83,590 customers and 31 behavioral and transactional variables from a hotel operating in Lisbon. After systematic data preparation and quality assessment, feature engineering produces indicators capturing frequency, intensity and timing of customer activity. Unsupervised segmentation techniques are applied to identify clusters in customer behavior, which are then profiled across value and risk dimensions. In parallel, customer value is assessed through RFM and value proxies, while behavioral risk is examined through cancellation, no-show and inactivity metrics (Gabelaia, 2025).

The expected findings emphasize managerial relevance. Segmentation is anticipated to reveal profiles such as frequent stable customers, high-spending but behaviorally volatile customers, channel-driven deal seekers and long-inactive customers with reactivation potential. Results are expected to show that high customer value does not necessarily imply low operational risk, highlighting trade-offs between economic contribution and behavioral reliability, with direct implications for overbooking and cancellation policies (Hou and Wang, 2026).

The originality of the study lies in its integrated treatment of customer segmentation, value assessment, and behavioral risk within a unified hospitality analytics framework. Limitations include the use of data from a single hotel and the absence of psychographic variables, which restrict generalizability and causal interpretation across different tourism and market contexts (Li et al., 2026).

Theoretically, the study contributes to hospitality and tourism management research by demonstrating how CRM-based behavioral analytics can enhance understanding of customer heterogeneity and operational risk. Practically, it supports more effective hotel management strategies by enabling evidence-based segmentation and differentiated customer policies, improving demand predictability and reducing revenue leakage (Gao, 2024).

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DIGITAL BENCHMARKING FOR A TOURIST DESTINATION POSITIONING ANALYSIS

Bonera, Michelle[1]; Bigi, Alessandro[2]

[1]Economics and Management Department, University of Brescia, Brescia, Italy

[2]Royal Docks School of Business and Law, University of East London, London, United Kingdom

Keywords: Tourism benchmarking, destination competitiveness, digital marketing, Lake Garda, keyword analysis.

Introduction

Tourism has undergone significant changes in recent years, as new technologies and shifting tourist behaviour create pressure for destinations to diversify and remain competitive. These dynamics have made tourism competitiveness and benchmarking a growing focus of research (Camp, 1989).

Lake Garda faces marked seasonality and overtourism pressures: in 2024, summer presences exceeded 18 million against approximately 190,000 residents (Legambiente, 2025), with the Verona shore at 14.7 million (+2.8% vs 2023) (Verona Chamber of Commerce, 2025) and the Trentino shore at 4.1 million (+1.7%). Digital marketing is emerging as an essential competitiveness tool in this mature market.

Purpose, Aim and Objectives

This study adopts a digital benchmarking approach to strengthen destination competitiveness, linking online search behaviour to territorial management models (Crouch & Ritchie, 1999; González-Rodríguez et al., 2023). It aims to benchmark the destination's digital performance and measure the impact of keyword searches on arrivals, proposing monitoring strategies for DMOs, while supporting integrated management that balances demand and accommodation capacity.

Literature Review and Theoretical Framework

The theoretical framework builds on Ritchie and Crouch's (2003) destination competitiveness model, distinguishing comparative resources (landscape, heritage) from competitive factors (marketing, management), and emphasizing digital technologies as a loyalty driver (González-Rodríguez et al., 2023; Bertoli et al., 2015). Benchmarking, as continuous comparison with best practices (Camp, 1989; Wöber, 2002; Bonera, 2016), extends this online, where search behaviour acts as a demand-side signal predicting tourist flows (Yang et al., 2015). Keyword search frequency is thus treated as

an indicator of destination brand salience rather than SEO visibility, extending the model's digital dimension; its link to satisfaction and loyalty remains beyond this abstract's scope.

Methodology and Methods

The methodology combines a qualitative approach (Camp's 1989 model; PDCA cycle) with quantitative analysis via SEOZoom, covering multilingual keyword research, URL analysis, and backlinks. Keywords (e.g. Lake Garda, Riva del Garda, Sirmione, key attractions, food and wine products) were identified through SEOZoom and validated against Google Trends. Search frequency and volume over 2023-2025, the most recent comparable post-COVID period, will be compared with ISTAT arrival data, aggregating keywords into thematic families and noting high-profile events. Key websites (visitgarda.com, tuttogarda.it) will be evaluated for organic traffic, domain authority, and SWOT; interpreting these indicators within the benchmarking framework will be elaborated as the analysis progresses.

Expected Findings and Contribution

The analysis will examine summer tourist numbers (June-August) across Lake Garda's three shores, distinguishing Italian and foreign visitors, using SEOZoom and Google Trends to track search demand. It will map the most searched-for locations, attractions, and food and wine products, noting the influence of high-profile events. Finally, it will assess promotional websites' SERP positioning and local promotion management to gauge the destination's competitiveness and efficiency.

Originality and Value

The study's contribution lies in applying digital benchmarking to a fragmented, multi-jurisdictional destination like Lake Garda, combining SEO metrics with competitiveness models (González-Rodríguez et al., 2023). The benchmarking method is intended to be transferable to other lake destinations facing similar governance fragmentation.

Research Limitations

A key limitation is that the study captures only digital search behaviour, not repeat visitors' loyalty (who may not search again before returning) nor offline destination awareness (e.g. word-of-mouth, prior visits, traditional media), both of which could bias the observed search-arrivals relationship.

Theoretical and Practical Implications

Theoretically, the study extends the Ritchie-Crouch model by treating digital presence as a support resource. Practically, it recommends DMOs monitor multilingual experiential keywords, link building, and mobile optimization; the authors hypothesize these actions could increase organic

traffic, a proposition the study aims to test, supporting deseasonalization and overtourism mitigation through food and wine diversification (Ganzaroli, et al., 2021).

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ASSESSING FINANCIAL DISTRESS IN SMEs: EVIDENCE FROM ITALY

Battisti, Enrico[1] Bongiovanni, Noemi[1] Kumar, Satish[2]

[1] Department of Management "Valter Cantino", University of Turin, Turin, Italy
[2] Sunway University, Sunway, Malaysia

Keywords: Financial Distress Prediction, Small and Medium-Sized Enterprises, Bankruptcy Risk, Italy.

Introduction and theoretical background

In an increasingly fragmented and unstable socio-economic context, the ability to anticipate financial distress has become crucial as corporate bankruptcy generates significant social and economic costs, including job losses, and spillover effects on local communities (Bernstein et al., 2019).

A growing number of studies have developed distress prediction tools, moving from the traditional econometric approach (Ohlson, 1980) to machine learning techniques capable of capturing nonlinear interactions among financial variables (Dasilas and Rigani, 2024). However, empirical evidence remains inconclusive regarding the superiority of machine learning over parsimonious models, especially in data-scarce environments (Bitetto et al., 2024). Small and medium enterprises (SMEs) remain underrepresented in empirical distress research, despite their structural fragility and central role in many economies (Altman and Sabato, 2007).

In this regard, Italy is particularly relevant: SMEs account for approximately 99% of total enterprises (ISTAT, 2023), making early distress detection a priority for economic stability.

Purpose

Empirical studies on SME-dominated economies remain scarce, and the optimal technique for forecasting distress is still unclear. In economies such as Italy, this gap creates a practical demand for implementable distress prediction tools. This study has two objectives. First, we assess the predictive performance of traditional and machine learning models on a sample of Italian SMEs, testing which approach better identifies financial distress.

Second, we conduct a dynamic deterioration analysis of key financial indicators in the three years preceding failure, providing evidence on the observable early warning signals highlighting the value of systematic financial statement monitoring for SMEs.

Methodology

The analysis is conducted on a dataset of 316 Italian SMEs, 158 inactive and 158 active, covering the period 2015-2023, extracted from AIDA. To ensure out-of-sample validity, a time-based training-test split is adopted: models are trained on observations up to 2019 and evaluated on subsequent data. The dependent variable is a dummy identify inactive firms (equal to 1) and active firms (equal to 0). The independent variables include 10 accounting ratios measuring profitability, liquidity, leverage, and firm size. To assess the prediction accuracy of different approaches, four models are estimated: Logistic Regression, Random Forest, XGBoost, and a Multilayer Perceptron (MLP). Moreover, to examine financial deterioration before bankruptcy, a dynamic analysis is conducted by monitoring the change in return on assets (ROA) and cash flow to debt from t-3 to t-1, comparing distressed and healthy firms using Welch's t-test.

Results

The results show that traditional and ensemble models consistently outperform the neural network approach, with Random Forest and Logistic Regression achieving the highest predictive accuracy (AUC = 0.837 and 0.826), while MLP performs the lowest across all metrics (AUC = 0.719). These findings suggest that, in limited data and heterogeneous environments such as SMEs, model simplicity may represent an advantage over complexity.

The dynamic deterioration analysis shows that distressed SMEs show a significantly greater decline in both ROA and cash flow to debt in the three years preceding bankruptcy than healthy firms (Δ ROA: -10.42 vs. -1.68, $p = 0.004$; Δ CF/debt: -0.067 vs. $+0.009$, $p = 0.002$). This evidence supports that deterioration in profitability and cash flows represents a reliable early warning signal, reflecting the gradual nature of financial distress.

Conclusions

This study provides empirical evidence on the ongoing debate concerning the quality of machine learning techniques. By focusing on SMEs, it highlights the limitations of complex techniques in small-sample environments.

Furthermore, this research reinforces the view that financial distress is a gradual process that can be monitored and anticipated through the analysis of specific financial statement ratios.
This research presents some limitations that open directions for future studies. Focusing on Italian SMEs, the results may not be generalized to other institutional contexts, in addition, the analysis does not consider non-financial aspects, such as management characteristics. Future research could focus on a wider sample of firms, analyzing non-financial data, particularly relevant when considering the bankruptcy dynamics.

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HUMAN-AI COLLABORATION IN ACCOUNTING: A SCOPUS-INDEXED BIBLIOMETRIC AND SYSTEMATIC LITERATURE ANALYSIS

Kourti, Eleni Despoina[1]; Drogalas, Georgios[2]; Lois, Petros[3]

[1]PhD Candidate, School of Business Administration, University of Macedonia, 156 Egnatia Street, Thessaloniki, Greece

[2]Associate Professor, School of Business Administration, University of Macedonia, 156 Egnatia Street, Thessaloniki, Greece

[3]Professor, School of Business, Department of Accounting, Economics and Finance, University of Nicosia, Europa Building, Nicosia, Cyprus

Keywords: AI, Human-AI collaboration, Accounting, Scopus, SLR, Bibliometric analysis.

Abstract

Originality/value/purpose: The present paper investigates the development and the current topic trends of the evolving thematology in the radically transformative for the accounting profession human-AI collaboration era. Having conducted a thorough global literature analysis of 17 peer-reviewed articles concerning human-AI synergy into accounting during the 2019 - 2025 time frame, the main scope of this comprehensive study is orientated towards identifying intellectual structures, research gaps, challenges and future opportunities in the field.

Design/methodology/approach: We have utilized the Scopus database to retrieve relevant sources for the Systematic Literature Analysis (SLR) conducted and Biblioshiny and VOSviewer software for the statistical and graphical presentation of the results and assumptions.

Findings: Our findings indicate a substantial surge in scholarly output over the last five years, revealing the escalating scrutiny concerning human-AI cooperation in the accounting domain. The keyword co-occurrence analysis performed, signified 4 principal thematic clusters, with the "AI" as the central one, being intertwined with the key dimensions of automation, decision-making and technical adoption.

Practical implications: Taking the clue from the performance analysis results, both academics and practitioners in the business sector are able to form a holistic realistic and view of subjects of interest regarding the professional human role, ethics, algorithmic fairness, trust and transparency.

Social implications: Underpinning USA and China as related research international hubs (in contrast with Europe), policymakers are promoted to take into account the workforce readiness and invest in sustainable development to embrace the beneficial potential of the human-AI in accounting sympraxis.

Introduction

Undisputably, given the rapid development and dominance of AI, accounting undergoes significant transformations regarding traditional practices. AI advancements improve accuracy and processing through automation, enabling effective auditing, financial forecasting, fraud detection and risk assessment (Omar *et al*., 2025). Nevertheless, the integration of AI in the accounting cycle raises critical moral and practical concerns about the dynamic role of human expertise and the constructive contribution of technological tools (Awwad *et al*., 2024). In the present era of digital innovation, the implementation of AI in the accounting profession utilizing Machine Learning (ML), Natural Language Processing (NLP), Robotic Process Automation (RPA), Large Language Models (LLM) and Visual Recognition Technology (VRT) could enhance strategic decision-making processes, accountability systems, stakeholder engagement and sustainability in organizational environments (de Villiers *et al*., 2024; Li *et al*., 2025).

Additionally, human participation is considered paramount for coordination, ensuring trust and credibility (Arkhipova *et al*., 2024). As AI enables pattern recognition and big data analysis, human judgment is essential to ensure transparency and rational interpretation of results (Roberts *et al*., 2025). The validity and reliability of outputs is intertwined with the ethical use of AI, professionalism and scientific background in order to ensure competent use of information (Bracci, 2023).

Acknowledging the research gap in this newly introduced, yet unexplored field, the interest is focused on the fruitful combination of the offered capabilities of AI and the creative ability of the human factor, with the common view placing hybrid collaboration models at the center of examination by supporting ways to achieve business excellence in challenging times (Mansour *et al*., 2025; Shazly *et al*., 2025). Key points are considered to be the human-AI cooperation, which does not imply under any circumstances the replacement of the human factor, but the workforce empowerment for the acquisition of new skills (Rossmann *et al*., 2025). Moreover, other matters of concern include the data privacy, the predictable outcome and the stability of algorithms accompanied by the reduction of bias, along with the identification and the filling of knowledge deficiencies (Thottoli *et al*., 2024).

In the light of these proposals and with the scope of delineating human-AI collaboration in accounting practice, we form the following interrelated research questions covering a wider spectrum regarding the growth pattern of human-AI collaboration research in accounting over time: To what extent does the existing research on human-AI applications in accounting address key issues and debates and which is the overall impact of the observed trends (**RQ1**)? What significant gaps, challenges and limitations persist in current literature (**RQ2**)?

This study’s contribution is multileveled: First, it aims to capture the evolution of the thematology and the diffusion of knowledge by critically engaging with the global discourse. It outlines the research web through descriptive statistics, graphically listing networks based on dominant co-

occurrence trends and interconnected terms, constructing an overall functional taxonomy rather than a simple classification (Lodhia *et al*., 2025).

Second, by performing a systematic literature synthesis (SLR) following PRISMA methodology, the study not only addresses issues of consensus, but also exposes contradictions and skepticism on contested or accepted theories, providing the impetus for broadening application-based intellectual horizons on issues such as automation override, balance of AI power, cognitive off loading and ethical buffering (human as moral agent). Under this inclusive approach, human-AI collaboration is placed in an actively progressive socio-technical system, interpreting the human synergy in terms of inventive partnership, strengthening the in-depth knowledge and improving the quality of bibliometrics employed.

Third, by utilizing Biblioshiny (Aria and Cuccurullo, 2017) and VOSviewer (Van Eck and Waltman, 2010) for the bibliometric analysis of the academic inquiry, the present paper offers a replicable method for mapping the research landscape and the intellectual structure of the field by testing the ability of these instruments to portray the worldwide literature. By bridging empirical findings and conceptual inquiry, our study unites silos of technical AI capabilities and human participation in accounting research. By synthesizing different approaches, from deterministic automation to collaborative intelligence, it underlines the fast-moving nature of AI in accounting. What is more, it provides richer, timely and actionable guidance and prescriptive insights to scholars, practitioners, businesses and society, enabling the holistic understanding of an unfolding roadmap rationally based on an "augmented intelligence" operational philosophy regarding human involvement and judgment in the modern accounting era.

Literature Review

SLR

Inspired from former articles that address human-AI collaboration and the paradigmatic shift in the accounting field, our study aims to shed light through a time-continuum analysis to transforming classical patterns and influencing, innovating, agile and interconnective prospects (Shehadeh and Hussainey, 2025). Without solely focusing on the reframing accounting profession, our study tries to enclose digitalization benefits under an augmented human-AI aided structure for optimal decision-making (Tani *et al*., 2025).

Unlike previous publications mainly orientated in human administration in intelligent task automation (Kokina *et al*., 2025), process management, self-learning technology monitoring (Subačienė and Tamulevičienė, 2024; in Dyczkowska, 2024) or AI for predictions, anomaly detection and the rationally-choosing accountant supervisor (Leitner-Hanetseder *et al*., 2021), our paper tries to highlight an unexplored and complex domain of changes and challenges brought about by this human-AI convergence at both the micro and macro levels (Bani Kinana and Arabiat, 2025). The depth of this mutual and compounded contribution is captured through an interactive, regulatory-based and fast-

processing framework (Yigitbasioglu *et al*., 2023). Additionally, we accentuate the need of encompassing both an analytical mindset and a hybrid skillset, promoting professional growth and emphasizing the adoption of pioneering practices for effective strategy implementation (Argento *et al*., 2025).

Moreover, taking into consideration Chaturvedi's *et al*. (2025) human-machine cooperation concerns regarding cognitive biases, managerial expertise, establishment of standards and ethical guidelines to ensure transparency and Fedyk's *et al*. (2022) about consistency, objectivity and trustworthiness, our study brings to the fore a critical spherical analysis of the interrelated terms "human-AI collaboration" and "accounting".

It is worth mentioning at this point that our research has been influentially triggered by Losbichler's and Lehner's (2021) and Azzutti's (2024) studies about assisted, augmented or autonomous human-AI synergy and "human-in" or "human-on-the-loop" mechanisms, as well as by Alghazzawi's (2024) article on technology acceptance model (TAM), competence, organizational readiness, perceived ease of use and usefulness in the accounting functions. Also, having meticulously studied Abdallah's *et al*. (2025) work on technology - organization - environment theory (TOE), which only takes into account the organizational level and even in the community innovation-sharing diffusion theory (DOI), our research adopts an all-embracing approach by simultaneously evaluating literature using a broadly recognized and extensive database.

Taking the initiation from Alaskar's *et al*. (2025) study about visual recognition technology (VRT) in auditing according to the unified theory of acceptance and use of technology model (UTAUT) in combination with El Khoury's *et al*. (2024) bibliometric analysis covering a great span of subjects of interest in a "RegTech" context (regulatory and technological), varying from the contribution of augmented intelligence to human-AI collaboration in accounting to human-machine role in metaverse, regarding blockchain, even "whistlebots", researchers underscore the notable role of human factor in the development of powered regulatory systems, the ethical and legal compliance and the adaptability crisis in an human-machine environment, without creating vulnerabilities (Bamhdi, 2024). Besides, by performing a thematic evolution analysis under the prism of conceptual framing and topic modeling, the study demonstrates a nuanced turn concerning human computer interaction (HCI) in a co-working condition, expanding the future interdisciplinary agenda and proposing practical policy implications (Ho and Vuong, 2025).

Bibliometric analysis

With the aim of spotting trends and future research avenues, we have utilized the "Biblioshiny" tool under the "bibliometrix package" in the "R" programming language and VOSviewer to visually and accurately display nascent topics with statistical completeness, as other open-source software or other tools do not provide the demanded all-inclusive workflow (De Silva *et al*., 2025).

In addition to the above, performance analysis enables the evaluation of the research and publication performance of various constituents, including most cited topics, journals, authors, their affiliated institutions and countries, depicting at the same time the scholarly production's pace in a particular research domain (Vatis *et al*., 2025).

Supplementary to the aforementioned, science mapping scrutinizes linkages between research works that outline the structural mapping and the intellectual connections within research domains (Ahmad Jaber and Mohammed Shah, 2024). This method utilizes relational indicators to optically illustrate the spatial associations among several components and their interrelationships (Hikal *et al*., 2025). What is more, content analysis demonstrates a plot of linking keywords in a word-based dataset, explores scholarly articles and spots the most frequent and interrelated variables in global literature by high pointing conceptual or semantic clusters of miscellaneous thematology concurrently and gradually, resulting in the cluster analysis map of the discipline (Zhang *et al*., 2020).

Methodology

To begin with, the keyword selection was conducted by meticulously examining the search terms used in previous bibliometric studies concerning AI, accounting and the human factor (Crupi *et al*., 2025; Dissanayake *et al*., 2025; Donthu *et al*., 2021; Elnakeeb and Elawadly, 2025; Kureljusic and Karger, 2024).

We utilized Scopus as it is considered a reliable database with an ample collection of peer-reviewed scientific articles (Ahmed *et al*., 2022; Liaras *et al*., 2024; Secinaro *et al*., 2022). We did not use and other complementary sources (e.g. Web of Science, Google Scholar etc.), as many researchers support the superiority and the adequacy of Scopus for the purposes of the specific study regarding wide coverage and easy retrieval of data, in contrast to the rest literature databases, avoiding at the same time possible overlap of dublicates and enabling both forward and backward citation tracking (AlQudah and Bariviera, 2026; Balstad and Berg, 2020; Chaudhary and Khandelwal, 2024).

During the initial exploratory search on January 30th of 2026 (identification stage), the first general sorting resulted in 287 documents (Figure 1). Next, we considered as necessary limiting the results only in the Business, Management and Accounting sector (32 articles), filtering the results by setting the research timespan in the last decade, from 2015 and afterwards, including solely journal articles and excluding books, book chapters, conference papers or reviews etc., limiting the results in only those written in English language. The final research query is presented below, with a final sum of 19 relevant articles appraised:

TITLE-ABS-KEY("artificial intelligence" OR "AI" OR "machine learning" OR "deep learning" OR "natural language processing" OR "ChatGPT" OR "dialogical system" OR "conversational system" OR "robotic process automation" OR "augmented intelligence" OR "computer" OR "technolog*" AND "human-AI" OR "human-machine" OR "AI-assisted" AND

"accounting" OR "accountant" OR "audit" OR "fraud" OR "financial reporting" OR "internal control") AND (LIMIT-TO (SUBJAREA,"BUSI")) AND (LIMIT-TO (DOCTYPE,"ar")) AND (LIMIT-TO (LANGUAGE,"English")).

Of them, 2 journal articles were excluded as irrelevant to the study, resulting in a cleared total of 17 journal articles considered for the bibliometric analysis in the eligibility phase and were then included in the study. Even though the number of articles included is so small, it is extremely targeted and representative enough to meet all our requirements. Secondarily, it supports the limited development and analysis of the subject of interest and the need for further investigation through our study (Majid *et al*., 2025).

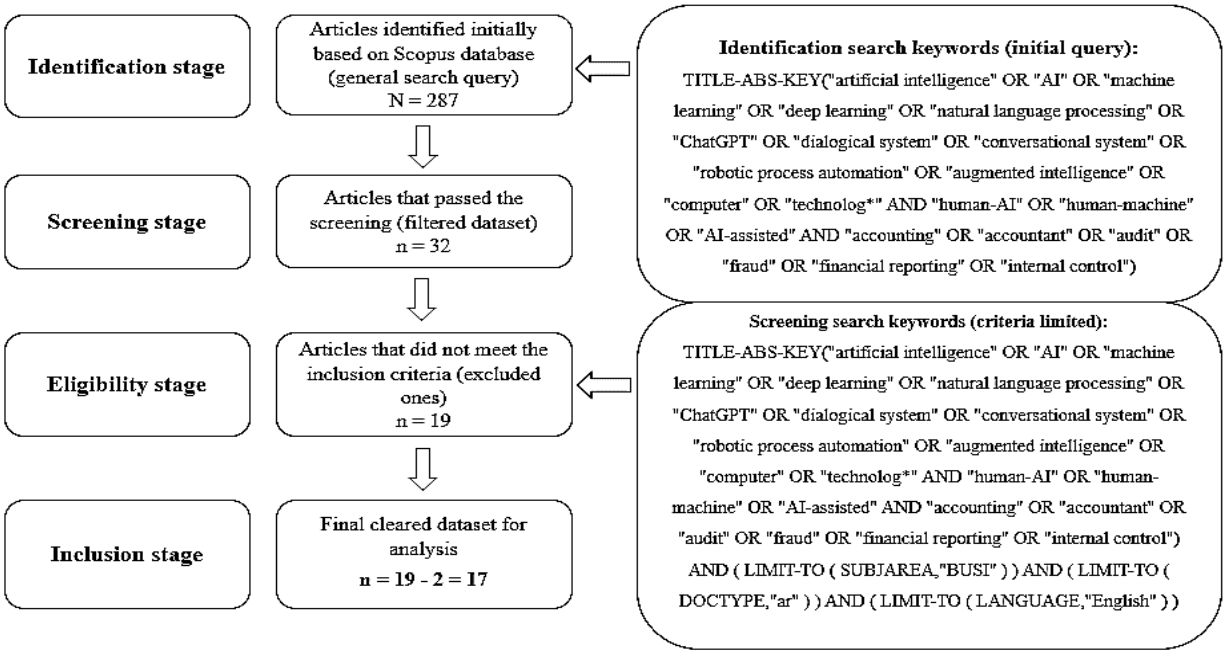


Figure 1: PRISMA Research Protocol - Data Extraction Procedure

Findings

By summarizing the data analyzed the following information were acquired: 17 relevant articles were identified in 17 journals during the timespan 2019 - 2025, with an annual growth rate of 30.77%, a document average age of 3.12 and an average of 22 citations per doc. A total of 169 references was identified, with the remaining data detailed below: 53 authors, 76 author's keywords, 75 keywords plus, 3.18 co-authors per doc (author's collaboration) and 41.18% international co-authorship, explaining the worldwide scholarly affiliation.

Performance analysis

At first, according to the Three-field plot (Figure 2) the International Journal of Educational Management seems to be the prominent one, spotlighted by a light red rectangle, indicating it as the leading source of publications on human-AI collaboration in accounting. The second section outlines the contributing authors, with some demonstrating affiliations to the journals discussed in the preceding section., Lehner, O.M. (2022b) and marked with an orange rectangle, Al Najjar, M. (2024) with a slightly lighter one and Gaber Ghanem, M. (2024) with a bright yellow one, are identified as

the most prolific authors in publishing articles indexed in Scopus, with the incoming flow count of 2 and 3 justifying the magnitude of connection between, its volume and intensity. The third column on the right presents the associated research themes, each linked to authors who are actively contributing to these areas. The image includes 14 interacting keywords for these topics, with "artificial intelligence" and "decision-making" having the greatest number of appearances, visually distinguished by light green rectangles, followed by "ChatGPT", "accounting", "AI", "accounting errors" and "automation".

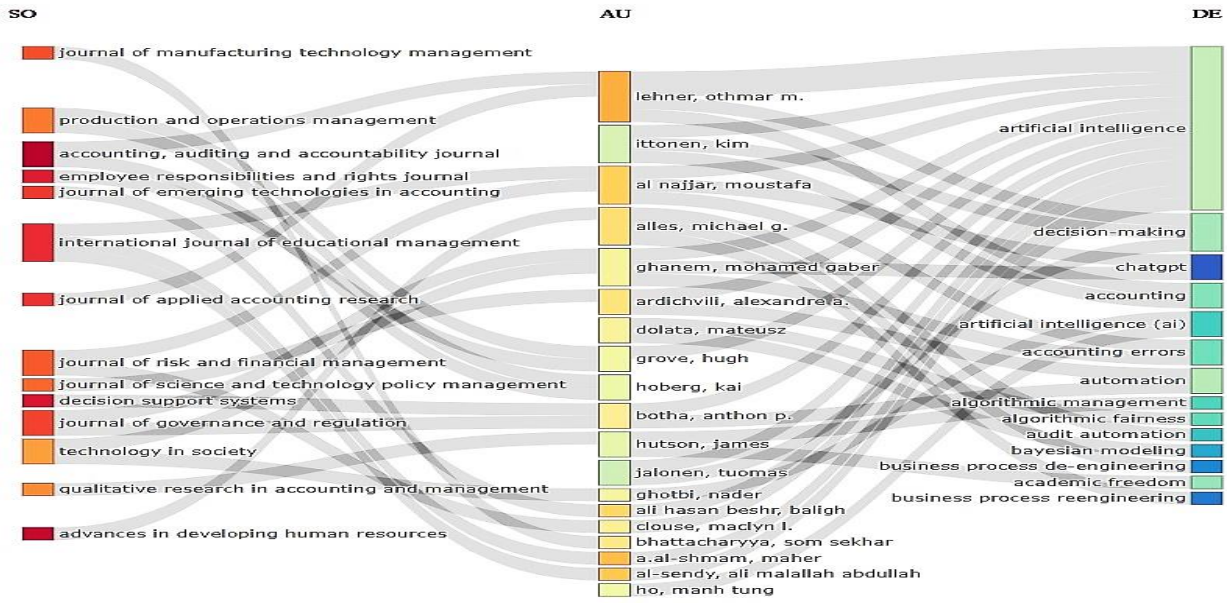


Figure 2: Three-field plot

Country analysis

Research on human-AI collaboration in accounting spans across 18 countries. Figure 3 shows that Finland has the largest share of publications, with 11 articles, while the USA follows with 10 articles, China with 5 and Hungary, Iraq and Lebanon with 3 articles each. However, countries as Indonesia, Netherlands, South Africa and Switzerland consist a minority with only one article published per country, showing significantly lower contributions compared to other continents. This fact raises reasonable concerns regarding the absence of activity in the Greek context and the motivations for its promotion.

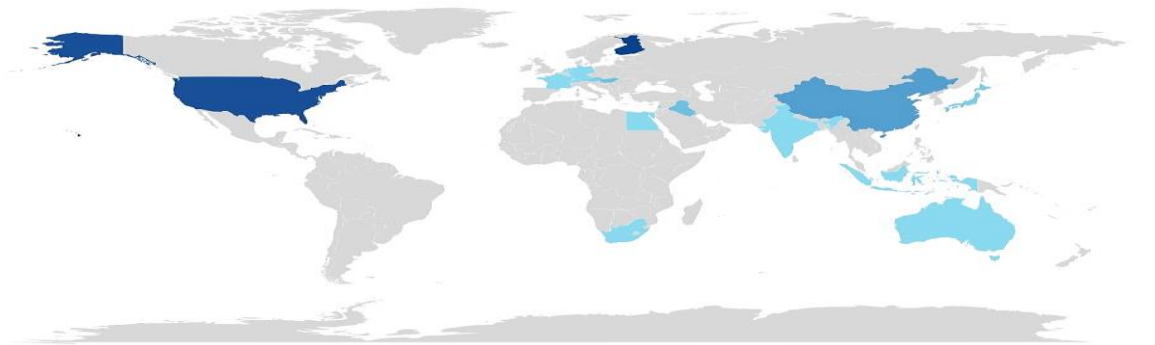


Figure 3: Countries' scientific production

Word analysis

Author-selected keywords are instrumental in tracking scholarly developments and assessing the dissemination of knowledge within the field. Figure 4 presents the most frequently used keywords in the literature on human-AI collaboration in accounting. The top four keywords are "artificial intelligence", "regression analysis", "sustainable development" and "technology adoption". Finally "20th century", "algorithmic fairness", "algorithmics", "automation", "automobile manufacture" and "automotive companies" follow with 1 occurrence each.

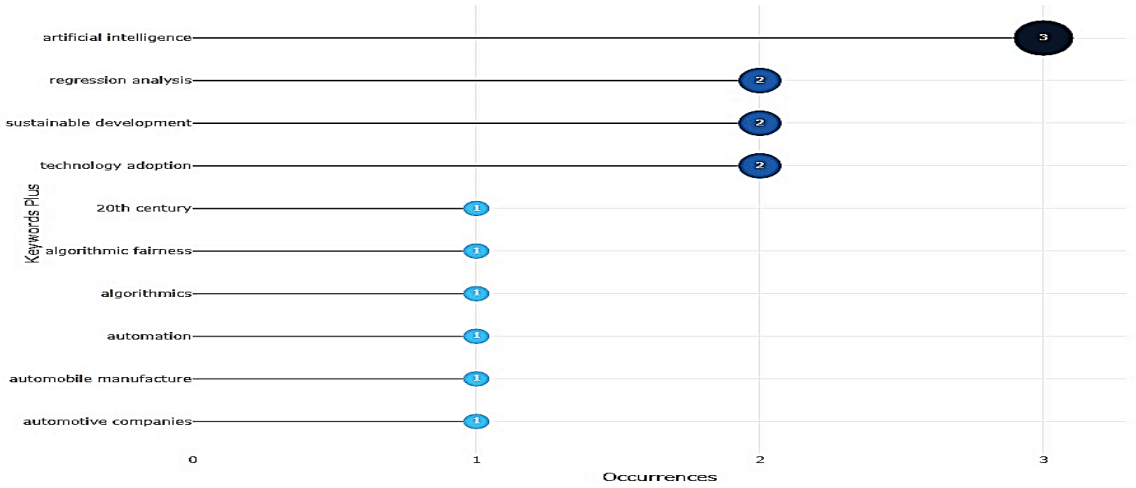


Figure 4: Most frequent words

What is more, topic trends are crucial to this research as they demonstrate both long-established and emerging research areas. Between 2019 and 2025, there was significant focus on AI and the human factor within the context of accounting, considering 2021 as the most significant starting point. A shift toward more specialized literature on human-AI collaboration in accounting has emerged too in more recent years indicating that the accounting profession draws and integrates multifaceted transformative influences from various fields.

Science mapping

Keyword Co-occurrence Network Analysis

By integrating co-occurrence frequency analysis with modularity-based clustering, the visualization of the keyword co-occurrence network reveals recurrent term associations within the global literature, thereby elucidating the interconnected thematic structure linking accounting, artificial intelligence and emerging digital technologies (Mechta *et al*., 2025). Larger node sizes indicate higher term centrality or frequency, while color-coded clusters represent thematically distinct, notwithstanding interconnected fields of research.

Our initial criteria were set to a minimum number of 2 occurrences of a keyword and of the 134 keywords included in the analysis, 5 met the threshold. So, in "genuine" clustering, the number of keywords to be selected was equal to 5 (greatest total link strength). This condition resulted in creating 5 clusters, albeit with one unconnected item (sustainable development). We repeated the clustering

using the same criteria, occurrences and strengths, but accepting this time the strongly related clusters' compression proposal. The final robust 4 cluster-network points more accurately the interconnected terms.

As it is obvious, the central red cluster "AI cluster" is clearly intertwined with the other three clusters, the green one "automation cluster", the blue one "decision-making cluster" and the yellow one "technology adoption cluster", validating the orientation of research interest to these pivotal dimensions.

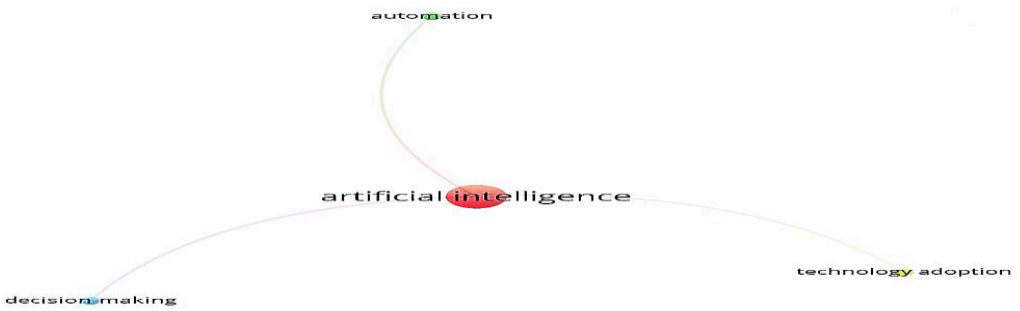


Figure 5: Co-occurrence network - Network visualization (4 final clusters)

Thematic map

In the highly dense and central Motor Theme quadrant, the cluster stands out comprising the terms "artificial intelligence" and "technology adoption". This fact is indicative that these terms are not only highly salient across the research domain, but are also characterized by strong internal development, reflecting mature, well-structured and influential scholarly discourse (Joshipura and Wats, 2023). Identified as Motor Themes, AI and technology adoption function as principal drivers of intellectual advancement and strategic orientation, particularly with respect to their application in decision-making processes concerning human-AI collaboration in accounting contexts (Chiappini *et al*., 2023).

The Emerging or Declining Theme quadrant is characterized by low centrality and density, so this placement of "sustainable development" stipulates a nascent research area that is still gaining traction which could be supported by appropriate policies, rather a declining topic of diminishing relevance (Farzam *et al*., 2025). Given the fact that the observed pattern more plausibly suggests an emerging thematic area, potentially reflecting its relatively recent application within accounting contexts that have yet to be extensively examined or fully integrated into the literature (Vernando and Mustakini, 2025). At this point, we should emphasize the role of legislation and implementation opportunities, combined with the acquisition of human resources skills to enhance the competitive business advantage.

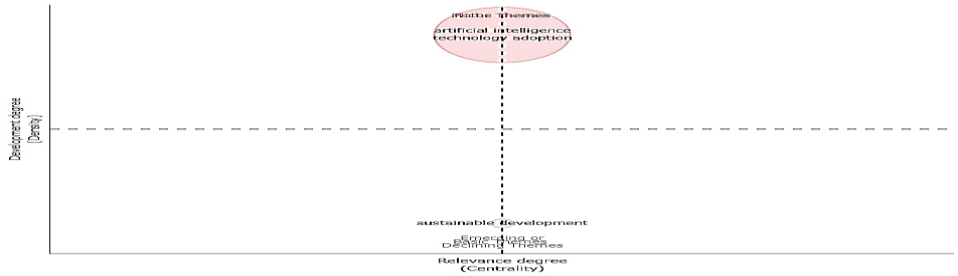


Figure 6: Thematic map

Combining this realization with the Basic Theme (low density, but central) overlap, it becomes obvious that although these themes demonstrate substantial relevance within the overall domain, they have not yet attained a high level of internal development regarding the strategic business goal setting (Radhouani and Ajina, 2025). They could render foundational or transversal topics that are widely referenced and interconnected across studies, yet may lack sturdy theoretical or empirical consolidation (Mohamad, 2024). Such themes frequently comprise the spine of emerging paradigms and function as points of departure for more extensive scholarly inquiry, bonding academia with business (Kumar *et al*., 2021). Also, it is worth mentioning at this point the total absence of values in the Niche Themes region. Over and above, the thematic map provides a multidimensional, macro-level perspective on how various topics, both explicit and implicit, interact within the research field, outlining the strengths upon which the enabling factors for the introduction into business practice could be based (Hassan *et al*., 2023).

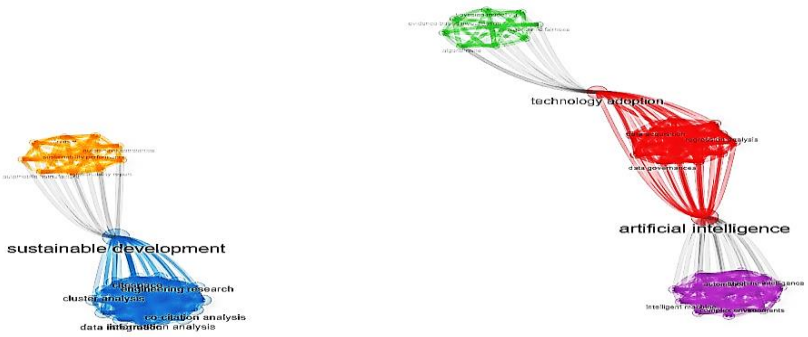


Figure 7: Thematic network

Discussion and Conclusion

Summarizing this inclusive and overarching review that has targeted the issue of human-AI collaboration in accounting from many perspectives, the prevailing broad business and sociotechnical trend of increasing interest in inclusion becomes apparent, essentially showing an interpretive orientation from academic research interest towards application in business contexts. Through our SLR study we have tried to rigorously explain and establish the imperative theoretical prerequisites for a multitude of practical recommendations regarding the integration, not only of AI in accounting practice, but of the decisive role of the human factor. On these grounds, human resources are intertwined with the technological boom, with the ultimate goal of the viable combination of technical

capabilities under the light of human critical theoresis in a dynamically, fast-pacing changing environment.

Although technological innovations raise concerns about accountability and reliance on machine-based "black box" decision-making, AI could be deemed not as a "modern omnipotence", but as a highly trained precious assistant, with the human as vital and experienced interpreter of the output. Even though hesitation is expected in this unprecedented coexistence in the professional world, our policy proposals include incentives for research funding for testing human-AI collaboration in accounting and fertile, adjustment-oriented, ameliorating feedback for practitioners. At this point, a new proposal is unraveling, concerning the ambivalent human-AI relationship, with the AI being influenced by human judgment and the human acumen being based on AI-standardized and verified for the accuracy information.

Finally, we could not overlook the pivotal role of Universities and appropriate funding, in order to provide incentives for AI implementation. Embracing the creative void and within the framework of lifelong education, social policy should focus on combating technophobia. Concluding, based on our findings and in a constructive developmental spirit, we should propose the readjustment of Greek accounting standards so as to align the forces of AI with regulatory frameworks and legislation, essentially contributing to the acceptance of this new reality of human-AI partnership.

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THE IMPACT OF STOCK MARKET VOLATILITY ON VENTURE CAPITAL INVESTMENT CYCLES

Saad, Muhammad[1]; Rossi, Matteo[2]
[1]Department of Law, Economics, Management and Quantitative Methods, UniSannio, Benevento, Italy

[2]Department of Law, Economics, Management and Quantitative Methods, UniSannio, Benevento, Italy

Abstract

This study examines the impact of stock market volatility on venture capital (VC) investment cycles, with particular emphasis on how fluctuations and uncertainty in public equity markets influence the timing, availability, and allocation of venture capital funding. VC investment is highly reliant on the market conditions, investor confidence, investor return expectations, and investor exit expectations; however, VC investment is important for innovation, entrepreneurship, and high growth business. This study examines the impact of higher stock market volatility on VC investment behaviour, building on three theories: Market Signaling Theory, Information Asymmetry Theory, and Real Options Theory, and whether such an impact differs by industry and stage of investment.

The research method employed in this study is empirical research with longitudinal panel data from 2004 up to 2023. Venture capital investment data, transaction data, public market data, and startup data are sourced from well-known financial databases such as VentureXpert, Thomson Reuters Eikon, CRSP, Compustat and SDC Platinum. Venture capital investment is used to track in terms of investment amount, number of deals, number of funding rounds, and start-up valuation, while the stock market conditions are measured by the returns from the stock market, number of stocks in the market, volatility of the stock market, which is calculated using standard deviation of stock index returns. Other data used for the indicators of public market

conditions and exit opportunities include the number of IPOs and the market-to-book ratios. Macroeconomic control variables include GDP growth, inflation and interest rates. To investigate the impact of stock market volatility on VC investment, a fixed-effects panel regression model with robust standard errors is applied, and the impact of key market events, such as market shocks, crashes, and rallies, on VC investment is assessed using event study techniques. Additional robustness tests consider alternative measures of market conditions, investment stages, industry characteristics, and lagged variables.

The results suggest that the stock market environment has a strong influence on the VC investment cycle. Strong VC investments are seen during periods of good market conditions and relative stability in the markets, whereas uncertainty and adverse market movements lead to lower investor confidence and hence less VC funding availability and timings. In addition, the analysis reveals that the public market signals are positively related to the venture capital investment, especially the occurrences of IPOs and the market valuation. Venture capital is more prevalent in industries that are more active in IPOs, have higher market-to-book ratios and have Internet and Computers businesses and Biotech and Healthcare businesses, which offer more positive growth possibilities and more viable exit opportunities. In contrast, industries with lower public market signals will see relatively low levels of investment activity. The results further indicate that experienced and specialised VC firms have a better ability to adapt to the dynamic market conditions and take advantage of investment opportunities.

In general, the results of this study show that the volatility of the stock market is an important determinant of Venture Capital Investment cycles. The timing and distribution of VC funds are impacted by shifts in market uncertainty, which impact investor risk perceptions, future

expectations on valuations and attractive exits. This study adds to the existing literature by highlighting the importance of market volatility in the relationship between public equity markets and VC cycles. The results offer some important implications for venture capitalists, entrepreneurs, policy makers and investors as they evaluate financing and investment opportunities in the market, noting the need to track market volatility and other public market indicators. Moreover, these findings highlight the importance of volatility monitoring in forecasting economic cycle-related changes in VC supply, VC investment timing and risk preferences, and financing conditions.

Keywords: ***Stock Market Volatility, Venture Capital, Investment Cycles, Venture Capital Investment, Market Uncertainty, IPO Activity, Market-to-Book Ratio, Startup Valuation, Public Market Signals, Investment Timing.***

THE ECONOMIC IMPACT OF UKRAINIAN WAR REFUGEES ON LITHUANIA: AN EMPIRICAL ASSESSMENT OF MACROECONOMIC CHANNELS

Gindrutė Kasnauskienė[1]; Simona Statauskaitė[2]; Rasa Paulienė[3]

[1]Department of Quantitative Methods and Modelling, Vilnius University, Vilnius, Lithuania

[2]Department of Quantitative Methods and Modelling, Vilnius University, Vilnius, Lithuania

[3]Department of Management, Vilnius University, Vilnius, Lithuania

Keywords: War refugees, Lithuania, Labor market integration, Economic impact, VAR model, Macroeconomic channels.

Introduction

The 2022 invasion of Ukraine by Russia triggered the most significant military conflict in Europe since World War II, resulting in a forced migration crisis of unprecedented scale (Burtsev, 2024). Over 7 million people fled Ukraine, with Lithuania emerging as a primary host nation, accommodating over 100,000 refugees by 2025—one of the highest rates per capita in the EU (Europos Parlamento tyrimų tarnyba, 2025; Valstybės duomenų agentūra, 2025). Within the framework of the EU's Temporary Protection Directive (TPD), these individuals were granted immediate rights to residency and employment, transforming the refugee influx into a critical demographic and economic factor for the Lithuanian state. As a result, refugees entered the labour market and domestic consumption systems almost immediately, which created conditions for economic impact to develop.

Purpose, aim and objectives

The primary motivation of this study is to move beyond the narrative of "emergency relief" and provide a data-driven evaluation of refugees as active economic participants. The aim is to evaluate the comprehensive economic impact of Ukrainian refugees on Lithuania across multiple macroeconomic channels. The objectives are to: (1) synthesize literature on the economic outcomes of forced migration; (2) analyze the Lithuanian case using high-frequency data; (3) identify specific transmission mechanisms through which refugees influence national accounts; and (4) propose policy adjustments based on observed integration patterns.

Literature review

International literature suggests that while refugees increase labour supply, their impact is often localized or structural rather than aggregate (Dumont and Lauren, 2022). Previous studies on Lithuania have often treated refugees as part of a generalized "war shock" (Kizilova, 2023; Pistunov et al., 2025). However, recent evidence from the Baltic context highlights the specific integration patterns and economic contributions of displaced populations (Deimantas & Şanlitürk, 2023). This is complemented by findings from other high-concentration regions, such as Czechia, where Postepska and Voloshyna (2025) demonstrated that large-scale Ukrainian displacement did not lead to significant negative effects on local employment, though it did alter labour intensity in specific demographics. This research utilizes Macroeconomic Transmission Channel Theory, focusing on four specific pathways: the labor market, domestic consumption, public finances, and GDP growth. This framework allows for a nuanced view of how a supply-side shock (labour) interacts with a demand-side impulse (consumption).

Methodology and methods

The study employs a dual-model quantitative approach. Ordinary Least Squares (OLS) regression models are used to estimate the relationship between refugee flows and key indicators. To account for the dynamic nature of these impacts, Vector Autoregression (VAR) models and Impulse Response Functions (IRF) were applied. These tools allow the research to isolate the refugee effect from other concurrent shocks (e.g., energy prices) and visualize how the economy reacts to migration pulses over time.

Main findings and contribution

The empirical analysis identifies several critical outcomes across the four primary transmission channels:

Labour Market

The refugee influx acted as a notable labour supply shock, though its aggregate effect on labour force size was statistically neutral (+0.07%). The adjustment was primarily structural: employment increased modestly by 0.15%, reflecting sectoral reallocation rather than net job creation. Refugees successfully filled vacancies in construction, digital services and logistics sectors without displacing local workers. While average wage growth slowed by approximately 1.5% in the short term, this effect was temporary, eventually converging back to the baseline. Ultimately, the Lithuanian labour market absorbed the inflow through increased labour utilization and structural flexibility.

Consumption and Inflation

Ukrainian refugees provided a weak but positive impulse to domestic consumption, which increased by approximately 0.12%. This effect was concentrated in the initial settlement phase and driven by immediate demand rather than income-related channels. Conversely, there was no meaningful impact on aggregate inflation; headline price levels changed by a negligible 0.02%. While localized pressures appeared in the housing rental market, the broader inflationary response was transitory and did not contribute to sustained price pressures.

Public Finances

Contrary to initial concerns of fiscal destabilization, the integration process was fiscally beneficial in the short term. While government revenues remained largely unchanged (-0.04%), public expenditure growth slowed by 0.09%. This was due to the refugees' rapid transition into the workforce, which reduced the expected reliance on social transfers. Consequently, the fiscal balance improved by approximately 0.05%. These effects were short-lived, with fiscal dynamics returning to baseline levels as the initial integration phase concluded.

GDP Growth

The impact on Lithuania’s GDP was positive but limited, with a marginal increase of approximately 0.01%. This growth was primarily transmitted through the consumption channel rather than immediate productivity gains or labour market expansion. Dynamic estimates confirm that this boost was short-lived, dissipating within a few quarters. While the refugee-driven demand provided a temporary lift to economic activity, it did not translate into sustained or structural output growth during the period analyzed.

Originality and value

This research provides the first isolated empirical assessment of Ukrainian refugees in Lithuania across comprehensive macroeconomic indicators. Unlike previous studies that isolate labour market competition or fiscal expenditures, this research employs a holistic Macroeconomic Transmission Channel framework. By simultaneously modeling the interplay between supply-side labor shocks and demand-side consumption impulses, it captures the 'multiplier effect' that singular-channel studies overlook.

The study offers significant value to policymakers by identifying the specific structural conditions that allowed Lithuania to exhibit remarkable absorptive capacity. Ultimately, this work shifts the academic focus toward the "resilience" of small open economies when facing sudden demographic shocks.

Research limitations

The study is limited by the short observation period (2022–2025), which may prevent the full capture of long-term productivity shifts. Additionally, conducting the analysis at a macro level may obscure specific micro-level challenges within rural versus urban integration zones. Another limitation is the lack of publicly available data on the number of Ukrainian refugees currently in Lithuania and how long they have been there, as official statistics only report inflows and do not systematically capture outflows, onward migration or long-term residence. Consequently, the analysis relies on refugee inflow figures, which may not accurately reflect the number of refugees currently participating in the Lithuanian economy.

Theoretical and practical impplications

Theoretically, this study extends the Labour Market Segmentation Theory by demonstrating that refugee inflows into a small open economy such as Lithuania do not result in direct competition for local jobs, but rather a complementary expansion of the aggregate labour supply. The findings indicate that refugees frequently occupy "complementary niches" within the economy, thereby addressing specific labour shortages in sectors such as logistics, manufacturing, and digital services. This phenomenon has the effect of preventing wage-push inflation during periods of tight domestic labour markets. Moreover, the results contribute to the field of Endogenous Growth Theory, suggesting that the successful integration of displaced populations can act as a "human capital injection" that can offset the negative growth impacts of an ageing demographic profile, provided that the Transmission Channels (specifically consumption and public finance) are properly facilitated.

In practice, the research calls for a definitive policy shift from "Emergency Stabilization" to "Dynamic Productive Integration." In order to optimise the macroeconomic advantages, the study proposes a series of recommendations. Firstly, it is advised that public expenditure be transferred from direct social transfers to targeted investment in entrepreneurship grants. Secondly, it is suggested that language barriers be eliminated and professional qualifications be harmonised in order to facilitate the transition of refugees from low-skilled, labour-intensive sectors to higher-value-added roles. Thirdly, it is imperative to ensure that this demographic shift serves as a long-term catalyst for resilient economic growth.

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CONTINUOUS INNOVATION AND IMPROVEMENT AS DUAL STRATEGIC CAPABILITIES IN DIGITAL TRANSFORMATION AND CUSTOMER EXPERIENCE DESIGN

Jubal, Camille[1]; Endress, Tobias[1]

[1] School of Management, Asian Institute of Technology (AIT), Bangkok, Thailand

Keywords: Customer Experience Transformation; Continuous Innovation; Continuous Improvement; Organizational Ambidexterity; Open Innovation: Omnichannel Retail; Service Design; Digital Projects, Digital Transformation; Experience Governance

Abstract

In a rapidly evolving retail environment marked by digitalization, shifting customer expectations, and omnichannel complexity, the transformation of customer experience (CX) has become a strategic priority for organizations. This research investigates how continuous innovation (CIx) and continuous improvement (CI) jointly contribute to the transformation of CX within the French retail sector. Drawing on seven semi-structured interviews with senior CX and operations professionals across diverse retail formats, the study adopts a qualitative, comparative approach supported by thematic and semantic coding.

Findings reveal that CX transformation is not driven by isolated technological initiatives, but by the dynamic interplay between operational stabilization and exploratory adaptation. Continuous improvement fosters process reliability, omnichannel consistency, and service standardization, while continuous innovation enables proactive engagement, personalization, and purpose-driven differentiation. These two forces are not contradictory but synergistic: organizations that structure dedicated governance mechanisms, such as shared dashboards, pilot charters, and cross-functional squads, can effectively orchestrate both CI and CIx.

The study highlights four key characteristics of successful CX transformation: (1) a shift from touchpoint metrics to journey-based orchestration, (2) omnichannel integration as a baseline expectation, (3) emotional and ethical engagement as loyalty drivers, and (4) a deliberate human digital hybrid design logic.

Introduction

Customer experience (CX) has evolved from a support function to a critical strategic asset for organizations across industries. With the democratization of digital channels and heightened consumer expectations, companies can no longer rely solely on traditional levers such as pricing or product quality to differentiate themselves. Instead, they must deliver consistent, personalized, and emotionally resonant experiences that span every touchpoint of the customer journey. At the same time, organizations are navigating increasingly complex environments marked by digital disruption, economic uncertainty, and rising competition (Brodie *et al.*, 2011; Verhoef *et al.*, 2019). In this environment, rapid adaptation and continuous improvement constitute vital organizational competencies. Open innovation models serve as strategic accelerators within this context, significantly reducing the cycle time of evolutionary improvements (Chesbrough, 2003; Endress, 2023). Companies are turning to two complementary approaches: continuous improvement and continuous innovation. The former focuses on optimizing existing processes and incrementally addressing customer pain points. The latter emphasizes breakthrough solutions, such as AI-powered innovation, journey-orchestration tools, and new service-delivery models, that redefine customer value propositions (Bilgram and Laarmann, 2023). This study is motivated by the need to better understand the interplay between continuous innovation, continuous improvement, and customer experience transformation. It examines whether these two approaches, often discussed separately in the management literature, can serve as key enablers of CX strategy when deployed in an integrated and intentional manner.

Research Design and Methodology

This study adopts a qualitative research design grounded in the interpretivist paradigm, which assumes that reality is socially constructed and best understood through individuals' subjective perspectives, embedded in their contexts. Semi-structured interviews were conducted online via Zoom or Google Meet and lasted 45-70 minutes. Participants were selected based on professional experience (min 3 years) and direct involvement in designing or leading CX innovation or digital projects. Data were analysed using thematic analysis, following Braun and Clarke’s (2006) six-phase process

Research Question	**Methodological Approach**
What are the key characteristics of CX transformation across different industries?	Thematic & semantic analysis of expert interviews

What are the key concepts of CX, and how have they evolved in the digital age?	Semantic analysis of expert language and framing
How do continuous innovation and improvement drive changes in CX practices?	Comparative analysis of real-world implementation case examples

Table 1: *Research Questions and Methodology*

The seven expert interviews reveal a coherent and nuanced understanding of how customer experience transformation unfolds in the French retail sector. Although participants represented diverse formats from hypermarkets to organic cooperatives, their accounts point to a common foundation: the transformation of customer experience is not the product of isolated initiatives but of a disciplined interplay between improvement and innovation. This integration does not occur by accident. It is embedded in managerial routines, cultural signals, and strategic governance that allow reliability and novelty to co-exist without conflict.

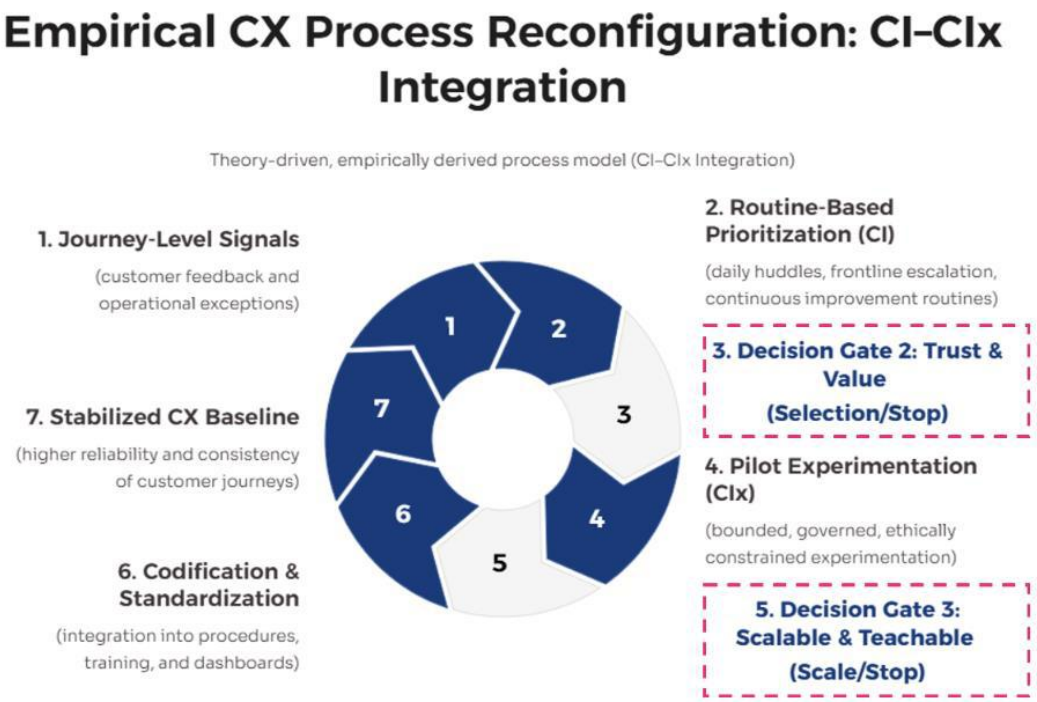


Figure 1: *CX Transformation Rrocess and CI-CIx Integration*

Figure 1 presents the reconstructed CX transformation process derived from the qualitative analysis. It represents a theory-inspired, empirically grounded process abstraction whose objective is to explicate how CX transformation is governed and sequenced in practice, rather than to prescribe execution-level workflows. The model conceptualizes CX transformation as a routine-based operating rhythm, in which Continuous Improvement (CI) and Continuous

Innovation (CIx) are not treated as parallel or independent streams, but as conditionally linked process logics coordinated through explicit decision gates. The circular structure reflects the recursive nature of CX transformation observed in practice, while the upward progression toward a stabilized CX baseline emphasizes the accumulation of learning rather than continuous disruption.

Discussion and Conclusion

The interview data show that CX transformation is perceived by practitioners not as a collection of isolated service enhancements but as a longitudinal and systemic redesign of how value is defined, delivered, and governed across the customer journey. This finding is grounded in participants' descriptions of the shift from fragmented, department-based KPIs to journey-based dashboards, in which performance is tracked across phases such as discovery, advice, checkout, delivery, and recovery. Rather than being evaluated solely through post-transactional indicators such as satisfaction scores, CX is monitored as an ongoing "storyline" that connects multiple touchpoints and actors.

The French context adds an additional layer of ethical consideration, shaped by GDPR constraints and strong cultural expectations regarding privacy and dignity. An interpretative conclusion stemming from these convergences is that, in French retail, CX transformation should be understood as *trust design* as much as *service design*. CX transformation is not about choosing between operational excellence and innovation — it is about structuring an organization to continuously balance and integrate both.

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ENTREPRENEURIAL FIRM RESILIENCE: A SYSTEMATIC REVIEW AND INTEGRATIVE FRAMEWORK (2010-2026)

AlZann, Noorhan[1]; Thrassou, Alkis[2]

[1]School of Business, University of Nicosia, Nicosia, Cyprus

[2]School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Entrepreneurial resilience, SME resilience, startup resilience, systematic review, dynamic capabilities, conceptual framework.

Abstract

This paper presents a systematic review of 41 empirical studies published between 2010 and 2026. It examines entrepreneurial firm resilience with a focus on start-ups and small-to-medium enterprises (SMEs). Conceptual fragmentation within this field of research has been identified through a structured analysis of methodological approaches, theoretical lenses, conceptualisation, antecedents and outcomes. While resilience is consistently treated as a single construct within the literature, it is often operationalised in fundamentally different ways. Patterns are synthesised into an integrative framework organising antecedents into seven thematic clusters, linking them to four conceptualisations archetypes and five outcome categories moderated by crisis context. Several research gaps are identified including the limited treatment of resilience as a dependent variable and the lack of a validated measurement instrument for resilience. The framework contributes to academic work, through identifying research gaps and suggesting future research opportunities within the field.

Introduction

Start-ups and SMEs are characterised by resource as well as organisational structure constraints making them more vulnerable to shocks and limiting their probability of surviving particularly within volatile market conditions (Aldianto *et al.*, 2021; Foris *et al.*, 2022).Their capacity to withstand, adapt to, and recover from shocks and disruption has emerged as an area of interest in entrepreneurship and management research.

Despite the growth of interest in this field, it remains theoretically fragmented. Resilience is defined, measured and positioned differently within existing empirical models depending on the focus of the literature, and as such remains inconsistent (Kézai and Kurucz, 2023; Hamed

et al., 2025). Resilience is sometimes positioned as an outcome, a dependent variable or occasionally an independent predictor. This conceptual inconsistency limits the synthesis and accumulation of knowledge in this field.

This paper has three main objectives: (1) the definition and framing of resilience within the literature and presenting a taxonomy of resilience conceptualisations (2) to analyse the operationalisation and testing of resilience in empirical studies (3) to synthesise these findings into an integrative framework that identifies key research gaps and proposes a structured agenda for future empirical work.

This paper makes two primary contributions. First, it advances a four-archetype taxonomy of resilience conceptualisations – capability, process, outcome and configuration. The taxonomic contribution provides definitional infrastructure the field currently lacks. Second, it presents an integrative framework that maps antecedents, conceptualisations and outcomes within a unified model positioning six research gaps as a structured agenda for future empirical work.

Literature Review

Defining entrepreneurial firm resilience

Definitions of entrepreneurial firm resilience vary considerably across the reviewed literature, reflecting the lack of a shared conceptual anchor within this field. The most prevalent definitional framing treats resilience as an organisational capability, defined as the ability of the organisation to anticipate, respond to, recover from disruption in addition to predicting future challenges and leveraging them for growth and innovation (Prijadi *et al.*, 2024; Alam, Razzak and Khreis, 2025). A second framing treats resilience as a dynamic process, defined as a sequence of adaptive responses by which organisations build or deploy capabilities to sustain operations before, during and post crisis (Tanveer, Torres De Oliveira and Rizvi, 2024). A third framing operationalises resilience as a performance outcome, equating it with post-crisis results such as survival probability, likelihood of default (Castaldo *et al.*, 2023) or growth and profit metrics such as sales or profit outlooks (Sinha, Raby and Salari, 2025). A fourth and less common framing treats resilience as a configuration, an emergent property of specific combinations of conditions rather than a single reducible antecedent (Cui et al., 2024; Wei, He and Xiang, 2024). These definitions do not only reflect terminological variance, but rather substantively differentiated underlying assumptions on what resilience is and the methods in which it should be measured.

Methodology

Search strategy and inclusion criteria

This study follows a systematic review methodology informed by the PRISMA 2020 framework (Page *et al.*, 2021). Electronic database searches were conducted across Scopus, ProQuest and EBSCO; Web of Science was unavailable through institutional access during the search period. The core search string applied, with minor database adaptations was: *("startup resilience" OR "start-up resilience" OR "new venture resilience" OR "entrepreneurial firm resilience") AND (theory OR theoretical OR framework OR conceptual OR model)*. The search was bounded to peer-reviewed journal articles published between January 2010 and February 2026.

Inclusion criteria required that studies (1) covered resilience empirically at the startup, SME, or entrepreneurial firm level; (2) theorised or modelled resilience explicitly as a core rather than as a peripheral concept (3) were published in peer-reviewed English journals. Studies were excluded if they focused exclusively on large or non-entrepreneurial organisations, if resilience appeared only peripherally, or if the primary unit of analysis was individual-level psychological reliance without firm-like modelling. Following the duplicate removal (n=33), abstract screening (n=153), and full- text assessment (n=52), 41 studies met all inclusion criteria and constitute the final corpus.

Coding procedure

Each of the 41 included studies was coded across 14 analytical dimensions: author, year, geographic context, firm-type, theoretical lenses (primary and secondary as applicable), research method, primary conceptualisation of resilience (classified as capability, process, outcome or configuration), role of resilience in the empirical model (classified as dependent or independent variable or mediator), operationalisation of resilience, key antecedents, key outcomes, crisis context, and one key synthesis insight. Coding was conducted by a single researcher, deriving initial codes from each study, and subsequently thematically organising them. In situations, where coding decisions were ambiguous, the coding rationale was documented and resolved by reference to each study's operationalisation of resilience rather than its stated definition.

Findings

Conceptualisation of resilience

Capability-based conceptualisation, 66% of studies (n=27) dominate the corpus, where resilience is framed as an organisational ability or capability of some sort (see Figure 1). However, this consensus reveals further heterogeneity. Within the capability category, resilience is modelled as a dependent variable in 18 studies, while in 6 studies it functions as a mediator translating antecedent capabilities into downstream outcomes, and in 7 studies as an independent variable predicting other constructs (Mota *et al.*, 2022; Fodouop Kouam, 2025; Hou, 2026; Lu *et al.*, 2026). This heterogeneity within a single conceptualisation type suggests that researchers are studying different phenomena even when using the same overarching category.

Process-based framings (20%, n=8) treat resilience as an evolving sequence of adaptive responses rather than a fixed organisational structure (Tanveer, Torres De Oliveira and Rizvi, 2024; El Kaddouri, González-Zapatero and Suárez-González, 2025a; Haruna *et al.*, 2025; Homayounfar *et al.*, 2025; Utomo, Wirawan and Dharmawangsa, 2025). Outcome-based framings (20%, n=8) equate resilience with a post-crisis result, such as survival probability, revenue recovery or growth metrics (Castaldo *et al.*, 2023; Alvarez-Salazar and Bazán, 2024; Bekele, Durevall and Fetene, 2026). Configuration-based framings (5%, n=2) argue that resilience is a property of a specific combination of conditions rather than a reducible individual construct (Cui *et al.*, 2024; Wei, He and Xiang, 2024). Four studies adopt mixed conceptualisations combining capability with process or outcome framings, reflecting the difficulty in containing resilience in a single analytic category.

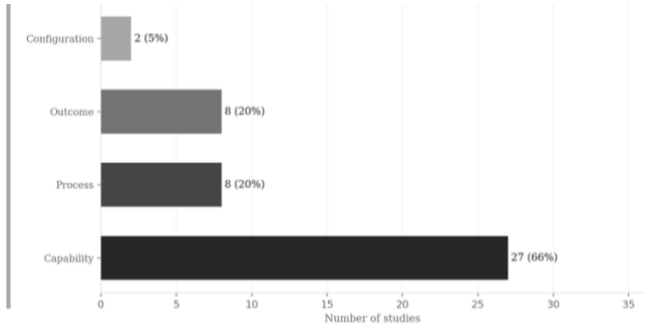


Figure 1: Distribution of primary conceptualisation of resilience across 41 reviewed studies. Counts are non-mutually exclusive; four studies adopt mixed conceptualisations combining capability with process or outcome framings, and percentages therefore sum to more than 100%.

Theoretical landscape

The dominant theoretical lens in the corpus (34%, n=14) is Dynamic Capabilities Theory (DCT), which is well-aligned, given than DCT's core proposition suggests that competitive advantage is derived from organisational capacity to sense, seize and transform opportunities by reconfiguring and renewing internal resources mapping directly onto resilience as an adaptive organisational capability (Teece, 2007; Sreenivasan, Suresh and Tuesta Panduro, 2022).

The Resource-Based View (RBV) constitutes the second most common lens (12%, n=5), though its application varies considerably. Some studies use RBV to present resource availability as buffers against disruption e.g. access to capital (Haruna *et al.*, 2025) or acting as shock absorbers (El Kaddouri *et al*., 2025b), while others emphasise knowledge and capability assets e.g. technological capabilities or agile leadership as drivers for business resilience (Aldianto *et al.*, 2021).

The remaining lenses represent smaller tranches of the literature, and reflect further diversity in their treatment to resilience, for instance, Organisational Resilience Literature (7%, n=3) treats resilience as an organisational property rather than a derivative of resource or capability configuration (Bürgel, Hiebl and Pielsticker, 2023; Kumar et al., 2024). Entrepreneurial Ecosystem perspectives (n=3) positions firm-level resilience within broader systemic conditions of institutional support and sectoral dynamism (Kézai and Kurucz, 2023). Socio-emotional Wealth (n=2) theory appears exclusively in family SME studies, capturing how such firms prioritise "non-economic objectives" such as the preservation of family identity and generational continuity as a motive to resilience-building behaviour (El Kaddouri et al., 2025b).

The remaining studies each offer theoretically distinctive insights including Knowledge-Based Theory, Contingency Theory, System Dynamics and Parasite Stress Theory amongst others but remain isolated contributions.

Methodological profile

Quantitative survey and structural equation modelling (SEM) approaches dominate the methodological landscape, accounting for 73% of studies (n=30, see Figure 2). Longitudinal and panel data designs represent 15% of the corpus (n=6), offering depth through repeated observations across crisis and recovery periods concentrated in financial and macroeconomic adversity contexts rather than pandemic settings. Mixed methods studies account for 17% of the corpus (n=7), combining survey instruments and qualitative interviews or case analysis to

capture contextual depth. Purely qualitative approaches represent 15% of the corpus (n=6) encompassing grounded theory, inductive coding, and focus group methodologies – suggesting that the lived experience of resilience building, while growing, remains underrepresented relative to quantitative designs (Tanveer, Torres De Oliveira and Rizvi, 2024). Interpretive and configurational modelling approaches including ISM, MICMAC, System Dynamics and fsQCA account for 12% (n=5), with fsQCA (n=2) representing an emerging configurational method capable of identifying equifinal pathways to resilience (Cui *et al.*, 2024; Wei, He and Xiang, 2024). Systematic review studies account for a further 5% (n=2).

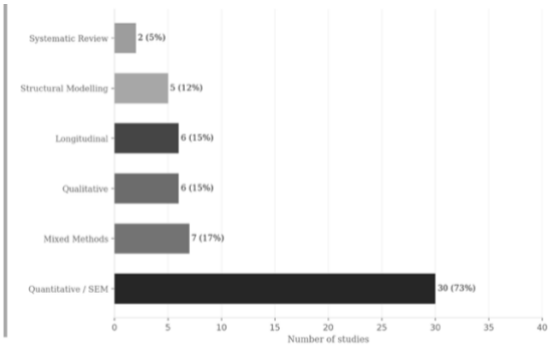


Figure 2: Research method distribution across 41 studies. Counts are non-mutually exclusive; a single study may employ multiple approaches.

Level of analysis

Startups (46%, n=19) and SMEs (32%, n=13) together represent 78% of the corpus , confirming the individual firm as the field's dominant unit of analysis. Studies drawing on mixed firm-type samples account for a further 22% (n=9), typically combining startups and SMEs along with other firm types. Family SMEs, a theoretically distinct category within SMEs given their unique governance structures and socio-emotional wealth considerations, appear in just two studies (5%, n=2) (El Kaddouri, González-Zapatero and Suárez-González, 2025a; El Kaddouri et al., 2025b). Ecosystem-level analysis, which position entrepreneurial firm resilience within broader innovation and institutional systems represent a distinct subset of start-up studies, are sparse (5%, n=2), despite growing theorical interest in how macro-environmental conditions shape firm-level adaptive capacity (Kézai and Kurucz, 2023; Cui *et al.*, 2024).

Crisis context

In some form, or another, COVID-19 features in 73% of the corpus (n=30), as the core adversity context in 15 studies and in combination with VUCA conditions or other crises such as Russia-Ukraine war and geopolitical instability in 15 studies. This concentration introduces a

significant temporal and contextual bias, findings derived from pandemic conditions may not generalise to other crisis types, including financial crisis, geopolitical shocks, or chronic low-grade turbulence characteristic of VUCA environments (Bürgel, Hiebl and Pielsticker, 2023; Castaldo *et al.*, 2023).

The corpus reveals meaningful adversity heterogeneity that remains underexplored. VUCA and general turbulence contexts account for 21 studies (51%) reflecting an orientation toward chronic environmental uncertainty rather than acute shocks. Geopolitical and economic crisis, including the Russia-Ukraine war, information and pre-pandemic financial crisis, feature in 9 studies (22%). Chronic adversity and grey rhino risks appear in just 2 studies (5%) despite being arguably the most strategically relevant adversity type for long-run firm resilience.

Analysis of the corpus identifies that validity across adversity types remains untested, a limitation that impacts the applicability of the findings beyond pandemic conditions.

Antecedent and outcome patterns

Digital capabilities and technology adoption (n=19) and Innovation and Research and Development (R&D) (n=16) (see Figure 3), are the two most cited internal drivers of resilience, followed by leadership and human capital (n=15). Top clusters collectively reflect an internal, firm-level orientation in how the field constructs resilience antecedents – what firms possess and what they do, rather than the conditions within which they operate (Mai *et al.*, 2023; Kumar *et al.*, 2024; Ho *et al.*, 2025). Ecosystem and network factors (n=12) and dynamic capabilities (n=10) complete the upper tier, bridging internal capability logic with relational and systemic conditions. Financial resources (n=10) and governance and strategic orientation (n=7) represent a secondary tier of enablers, together reflecting the structural and resource conditions that amplify firm-level resilience capacity but rarely feature as primary explanatory drivers (Haruna *et al.*, 2025; Zhang and Li, 2025; El Kaddouri et al., 2025b).

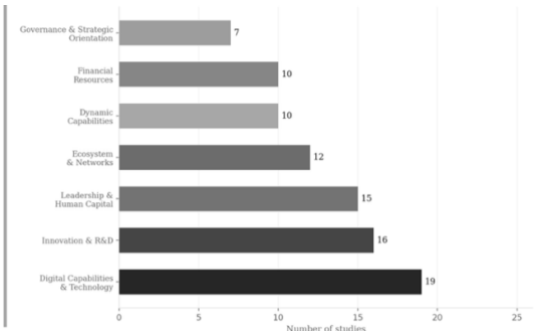


Figure 3: Key antecedent clusters across 41 reviewed studies. Cluster counts reflect frequency of appearance and are non-mutually exclusive; a single study may contribute to multiple clusters.

With respect to outcomes, firm survival and continuity is the most frequently identified downstream consequence of resilience (n=18), followed by competitive advantage and sustainable growth (n=17) and then financial and operational performance (n=12, see Figure 4). The prominence of survival as the primary outcome suggests that entrepreneurial firm resilience research remains fundamentally oriented toward viability and continuity - a finding consistent with the field's dominant capability framing and its focus on firm preservation rather than transformation. Recovery and adaptation (n=9) and innovation and digital transformation (n=7) represent emerging outcome pathways that remain undertheorised in the current literature, suggesting that the transformative and regenerative dimensions of resilience have yet to attract sustained empirical attention (Fodouop Kouam, 2025; Li *et al.*, 2025)

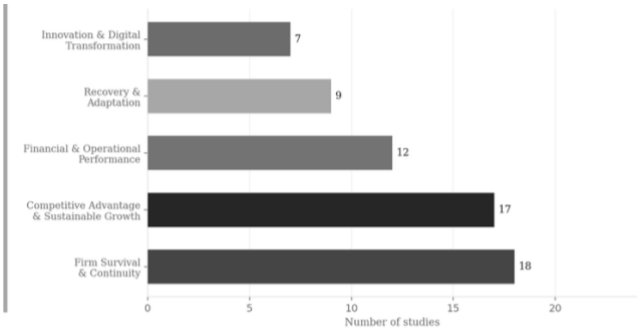


Figure 4: Key outcome clusters across 41 reviewed studies. Firm survival and continuity (n=18) is the most frequently identified downstream consequence of resilience, followed by competitive advantage and sustainable growth (n=17). Outcome counts are non-mutually exclusive.

Discussion

The integrative framework synthesised from the 41 reviewed studies is presented in Figure 5. The framework organises the field's empirical knowledge across three analytical layers – antecedents, conceptualisations and outcomes moderated by crisis context, and positions six key research gaps at the heart of the model as the principal contribution of this review. Conceptual ambiguity within this field, is the core argument presented by this framework – the literature presents resilience as a unified construct while it is presented through substantively distinct constructs.

Capability studies tend to draw on DCT and RBV, treat resilience as the endpoint of capability-building processes, and measure it through multi-item Likert scales. Outcome studies draw predominantly on firm survival or endogenous growth or resource-based theories and operationalise resilience through financial performance ratios or exit hazard models. Process

studies emphasise temporal dynamics and employ qualitative or system-level methods (Tanveer, Torres De Oliveira and Rizvi, 2024; Homayounfar *et al.*, 2025; Utomo, Wirawan and Dharmawangsa, 2025). Configuration studies require set-theoretic methods capable of capturing equifinality and multiple causal pathways (Cui *et al.*, 2024; Wei, He and Xiang, 2024). These are not compatible research programs operating under the same label – they are substantively different enquiries whose integration requires first acknowledging their distinctiveness.

The findings carry clear implications for both theory and practice. Theoretically, the dominance of DCT as a theoretical lens, while productive, risks constraining the field's explanatory range – SEW, Entrepreneurial Ecosystem perspectives and Organisational Resilience Literature each offer theoretically distinct and underutilised pathways for advancing understanding of resilience in family firms, ecosystem-embedded startups and process-oriented contexts respectively. The integrative framework presented here provides a structural basis for future theory-building by making the field's conceptual boundaries visible and mappable. For policymakers, the review confirms that digital capabilities, innovation orientation and leadership quality are the most consistently cited enablers of entrepreneurial resilience – suggesting that interventions targeting these dimensions are most likely to yield resilience dividends across diverse adversity contexts. Equally, the secondary tiers of enablers – ecosystem conditions, government support and financial access – represents levers that policy can directly target, particularly in resource-constrained and emerging market settings.

Taken together, the findings suggest that entrepreneurial firm resilience is a field in active conceptual contestation. The dominance of capability-based framings and DCT does not reflect a settled theoretical consensus but rather a methodological default. SEM-based survey designs favour capability operationalisations, creating a self-reinforcing cycle in which method drives conceptualisation rather than the reverse. Breaking this cycle requires the field to first agree on what resilience is before debating what builds it.

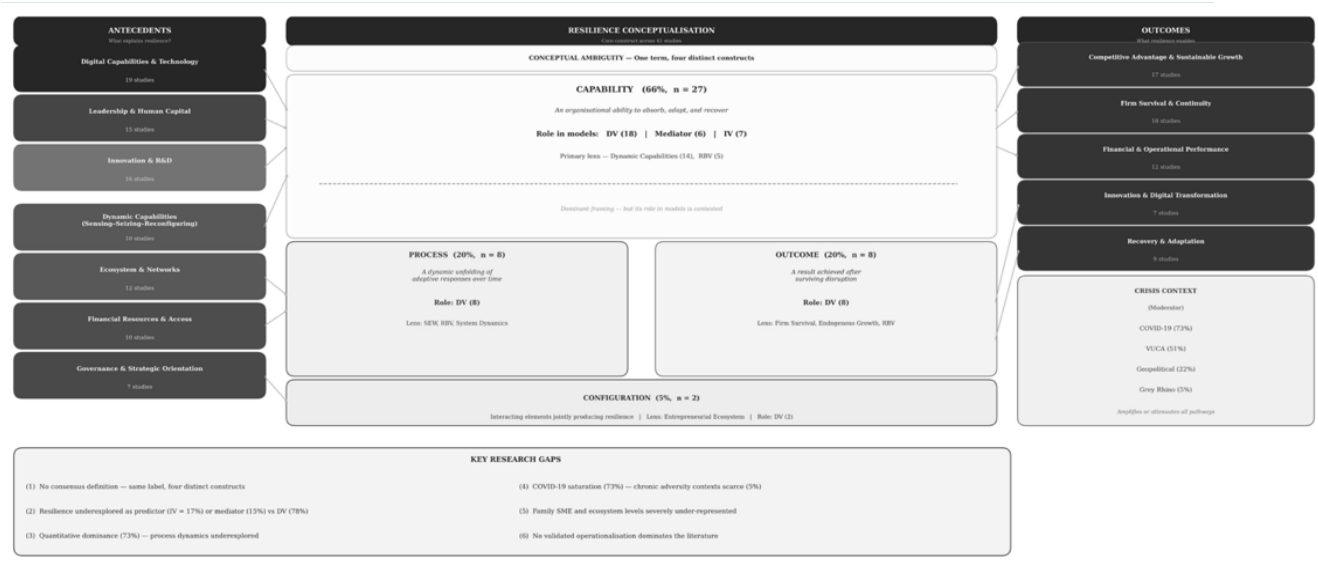


Figure 5: Integrative Framework of Entrepreneurial Firm Resilience: Antecedents, Conceptualisations, Outcomes and Research Gaps (2010–2026). The framework synthesises findings from 41 peer-reviewed empirical studies across three analytical layers — antecedents, conceptualisations, and outcomes — moderated by crisis context. Four conceptualisation archetypes are identified: capability (66%, n=27), process (20%, n=8), outcome (20%, n=8), and configuration (5%, n=2). Six key research gaps are positioned at the centre of the model. Counts are non-mutually exclusive.

Key Research Gaps

Gap 1: No consensus definition. The field lacks an agreed definitional boundary for entrepreneurial firm resilience. Adopting a layered definition, distinguishing resilience as a capability, a process or an outcome, is suggested. Definitional consistency would allow more precise cross-study comparison.

Gap 2: Resilience as predictor and mediator remain underexplored. This means existing learning is focused on factors that contribute to building resilience, rather than the outcomes and product of what resilience can build. For instance, resilient firms may demonstrate stronger post-crisis innovation output, having developed adaptive routines that accelerate new product development or greater internationalisation readiness leveraging operational flexibility to enter new markets. Longitudinal designs that position resilience as a predictor of downstream firm-level outcomes represent a significant and largely untapped opportunity for future research.

Gap 3: Methodological monoculture: the dominance of quantitative survey and SEM methods limits the field's ability to study resilience as a dynamic process, to examine how resilience is experienced and built over time, and to capture the role of context in shaping adaptive

responses. Diversity in methodological approaches could support future research and enrich findings.

Gap 4: COVID-19 saturation and crisis specificity. With majority of the studies focused on pandemic context, generalisability to other forms of adversity cannot be assumed. Research designs that explicitly compare resilience dynamics across crisis types, or that situate firms within non-pandemic adversity contexts, are needed to establish the boundary conditions of current resilience models.

Gap 5: Under-representation of family SMEs and ecosystem levels. Family SMEs and entrepreneurial ecosystem perspective remain severely underrepresented despite their theoretical significance and as such present attractive research opportunities.

Gap 6: No validated operationalisation dominates. The corpus reveals extraordinary diversity in how resilience is measured. The development and validation of psychometrically robust and entrepreneurial firm resilience scale is an important methodological priority for the field.

Conclusion

This paper set out to map the conceptual landscape of entrepreneurial firm resilience through a systematic review of 41 empirical studies published between 2010 and 2026. Three findings deserve emphasis. First, the field's apparent consensus around capability-based framings conceals deep heterogeneity in how resilience is defined and measured – a heterogeneity that limits cumulative knowledge-building and constrains cross-study comparability. Second, Dynamic Capabilities Theory provides the dominant theoretical infrastructure for the field, but this dominance risks theoretical monoculture: important phenomena such as family firm resilience or ecosystem-level dynamics could be better captured by alternative theoretical lenses that remain substantially underutilised. Third, the pandemic has generated a concentration of empirical work but constrains the generalisability of current models beyond pandemic conditions.

The integrative framework presents key research gaps, including the need for a consensus definitional framework that distinguishes capability, process, and outcome dimensions of resilience – a prerequisite for the theoretical coherence and cumulative progress the field

currently lacks. The framework also highlights the untapped potential of positioning resilience as a predictor variable and studying its downstream effects.

This study has limitations inherent to the systematic review methodology. The 41 studies represent the corpus meeting our inclusion criteria, studies in languages other than English and grey literature are excluded by design. The thematic clusters and integrative framework reflect interpretive coding decisions that while conducted systematically and documented transparently involve an element of researcher judgment not fully eliminable through single-coder designer. Future work should test the framework's propositions empirically and extend the review to include ecosystem-level longitudinal comparative design that the current corpus underrepresents.

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DETERMINANTS OF DISRUPTIVE INNOVATION: EMPIRICAL PROOF FROM THE MANUFACTURING SECTOR

[1]Madentzoglou, Sofia; [1]Kafetzopoulos, Dimitrios; [1]Gotzamani Katerina; [1]Vouzas, Fotios
[1]Department of Business Administration, University of Macedonia, Thessaloniki, Greece

Keywords: Employee Motivation, Entrepreneurial Leadership, I4.0, Disruptive Innovation

Introduction

The contemporary business environment is increasingly characterised by rapid technological advancement and persistent market dynamism. Under such conditions, firms can no longer rely solely on incremental innovation to maintain their competitive position. Consequently, scholar interest in disruptive innovation as a means of responding to and reshaping evolving markets and technological trajectories has grown substantially, resulting in a broad yet increasingly fragmented body of literature.

Purpose, Aim and Objectives

This paper seeks to examine the impact of employee motivation, entrepreneurial leadership and Industry 4.0 (I4.0) on disruptive innovation. Grounded on the Dynamics Capability Theory, the study reveals how the interplay of technological, human and entrepreneurial capabilities facilitates the dual dimension of firms' disruptive potential.

Literature Review and Theoretical Framework

Disruptive innovation may emerge through targeting overserved customers in low market segments or through new value propositions (Mookerjee and Rao, 2021). Its realization, however, extends beyond the generation of radical ideas and depends on organisational conditions that support innovation. Employee motivation is particularly important, where intrinsic and extrinsic motivators strengthen innovation capabilities when applied in tandem (Gupta, 2020). Additionally, entrepreneurial leadership supports innovation through knowledge integration, market sensing, and strategic flexibility (Hensellek *et al.,* 2023). Similarly, I4.0 constitutes an important catalyst for innovation intensifying the competitive pressure faced by established firms from technologically enabled new entrants (Niewöhner et al., 2020). Taken

together, these capabilities can be viewed as complementary micro foundations, enabling a firm's ability to sense, seize, and reconfigure resources for innovation.

Methodology and Methods

The study tests a hypothesis-based model with a sample of 355 Greek manufacturing firms. Construct reliability was assessed using Cronbach's alpha. To examine the interrelationships among the constructs hierarchical regression was employed. This method was selected in order to evaluate the incremental and unique effects of the predictors on disruptive innovation.

Findings and Contribution

The findings provide strong support for the effects of entrepreneurial leadership and I4.0 on disruptive innovation. I4.0 exerted a pronounced effect on new-market disruption ($\beta = 0.594$, $p < 0.001$) compared with low-end disruption ($\beta = 0.359$, $p < 0.001$). Entrepreneurial leadership was also positively associated with both dimensions, with a stronger effect on low-end disruption ($\beta = 0.232$, $p < 0.001$) than on new-market disruption ($\beta = 0.209$, $p < 0.001$). By contrast, employee motivation did not exhibit a significant effect in the analysis.

Originality and Value

This study addresses the underexplored subject of disruptive innovation by examining employee motivation, entrepreneurial leadership, and I4.0 within an integrated model. Its originality lies in conceptualizing disruptive innovation through new-market and low-end disruption, rather than as a homogeneous construct. This disaggregation enables a more nuanced assessment of how organisational factors shape distinct forms of disruptive innovation.

Research Limitations

Future research should extend to the service and commercial sectors for generalization of the model. Moreover, further empirical investigation is needed to explore the role of intrinsic and extrinsic motivation on disruptive innovation.

Theoretical and Practical Applications and Implications

Managers should align I4.0 with strategic objectives and complement technological capabilities with entrepreneurial leadership practices. Fostering employees' entrepreneurial self-efficacy

and autonomy can strengthen the organizational conditions required to translate technological potential into disruptive innovation. Moreover, this study offers valuable theoretical insights, extending the Innovation Diffusion Theory by demonstrating how organisational capabilities shape distinct disruption types.

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SMES' CHALLENGES IN CREATING AUTHENTIC DIGITAL CONTENT MARKETING: A RESEARCH IN PORTUGAL

Casais, Beatriz[1, 2]; Preto, Érica[1]; Abreu, Diana[1]

[1]School of Economics and Management, University of Minho, Braga, Portugal

[2]iBMS – Centre for Research in Business, Markets & Society, University of Minho, Braga, Portugal

Keywords: Digital Marketing, SMEs, Outsourcing, Content Production, Brand Authenticity, Agency Theory, Prescriptive Model, Digital Advertising

Introduction

Digital content production often exceeds SMEs' internal resources (Reyes-Mercado & Barajas-Portas, 2020), forcing a choice between internalising digital marketing competences and externalising content production to agencies and freelancers (Hughes, Vafeas, & Hilton, 2018). Consumers increasingly value brand authenticity, built on truthful discourse (Beverland & Farrelly, 2010), which externalisation may compromise. This research connects the externalisation decision with its consequences for brand authenticity.

Purpose, Aim and Objectives

This research aims to understand how SMEs manage the internalisation-externalisation decision regarding digital marketing content production, from the barriers to developing digital communication. The research identifies the challenges driving internalisation of digital communication and examines the governance of brand authenticity once content creation is delegated.

Literature Review and Theoretical Framework

SMEs' limited internal marketing capabilities are documented (Reyes-Mercado & Barajas-Portas, 2020). However, the link between the governance of outsourced content in the management of brand authenticity is unresearched. Agency Theory (Eisenhardt, 1989) casts the brand as principal and the agency as agent, treating information asymmetry as a risk controlled through monitoring (Tate et al., 2010). This contractual view sits uneasily with

authenticity research, which frames genuine brand communication as relational and co-created (Haimson et al., 2021). This research analyses the specificities of Agency Theory in creative marketing services.

Methodology and Methods

Two sequential qualitative studies were conducted. Study 1 comprised 12 semi-structured/structured interviews with SME managers, agencies and freelancers, purposively sampled among respondents managing active digital advertising campaigns. Study 2 comprised 20 interviews with 12 brand managers and 8 agencies/freelancers managing outsourced social media. Interview Guides were literature-grounded and data were analysed thematically in NVivo.

Findings and Contribution

Study 1 shows that technical knowledge gaps, unrealistic expectations and poor measurement of return on investment drive SMEs toward externalisation. Those combining internal training with selective outsourcing achieve superior outcomes. These results informed a Prescriptive Model operationalising the internalisation-externalisation decision across campaign stages. Study 2 shows that, once externalised, authenticity is preserved not through contractual monitoring but through relational governance. Continuous communication, information sharing and integration of the agency into the brand's culture substitute for formal control, reframing the agency-brand tie as a trust-based partnership. Behind-the-scenes footage and unpolished video emerged as authenticity signals that can be explored in content marketing.

Originality and Value

This paper empirically shows how Agency Theory's information-asymmetry premise can be reframed by relational governance in creative marketing services.

Research Limitations

Both studies rely on qualitative, self-reported data from Portuguese SMEs and marketing partners, limiting generalisability. Comparative studies across sectors and countries would extend applicability.

Theoretical and Practical Applications and Implications

The research shows that relational mechanisms can substitute monitoring-based control in Agency Theory. The proposed prescriptive model and authenticity-preserving practices guide SME managers on whether to internalise or externalise digital marketing competences and how to safeguard authenticity thereafter.

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THE ROLE OF MIDDLE MANAGERS IN KNOWLEDGE AND CAPABILITY TRANSFER DURING AN ACQUISITION

Girard, Flavie[1]; Papadopoulos, Andrew[1]; Lemieux, Nathalie[1]

[1]École des sciences de la gestion / Université du Québec à Montréal, Montréal, Canada

Keywords: Post-Acquisition Integration, Middle Management, Knowledge Transfer, Capability Transfer, Sensemaking, Mergers and Acquisitions, Codification

Abstract

This paper examines the role of middle managers in knowledge and capability transfer during post-acquisition integration (PMI) in an acquisition, addressing a critical gap in merger and acquisition, PMI and knowledge transfer literature. Grounded in the resource-based (Barney, 1991) and knowledge-based (Grant, 1991) views and dynamic capabilities (Teece et al., 1997) with overlays frameworks by Nonaka and Takeuchi (1995) and Szulanski (2000). Middle managers are positioned as mediators between codification and personalization strategies. We undertake twenty-two semi-structured interviews with middle managers from both acquiring and acquired firms that were analysed via thematic case-based analysis (Yin, 2018; Boutin, 2018) during 2023 acquisition in the Canadian professional services sector. Middle managers function as knowledge architects, sensemakers, change leaders, and process guardians. Their roles are distinct yet complementary: acquiring managers drive structural integration while acquired managers preserve core competencies and translate change. Knowledge transfer emerges as a selective, political, and social process rather than an a technocratic one. We make three contributions to the PMI and knowledge management literature. First, it introduces sensemaking by proxy as a theoretical construct, extending Weick's (1995) sensemaking framework to account for the mediated, positional nature of meaning-making by middle managers. Second, it develops an empirical model of middle managers' dual enabling and gatekeeping ambidexterity, nuancing that facilitators and resistors are distinct actors. Third, by surfacing the micro-foundations of knowledge transfer, cognition, trust, relational dynamics, the study responds to calls for process-level theorizing in PMI research (Graebner et al., 2017). Methodologically, access to an active PMI addresses a persistent empirical gap, as most research relies on retrospective or archival data. The findings also suggest a need to assess absorptive capacity and learning culture prior to deal closure.

Introduction

Mergers and acquisitions (M&A) are among the most consequential strategic tools for firms seeking rapid growth, access to new capabilities, or enhanced competitive positioning. A persistent paradox characterizes the M&A landscape: a substantial proportion of acquisitions fail to deliver their objectives due to the inadequacy of PMI - synergies, organizational knowledge and capabilities transfers fail to take root.

The knowledge transfer literature has made significant advances in understanding why PMI frequently falls short. Tacit knowledge, embedded in organizational routines, interpersonal relationships, accumulated professional experience, migrates difficultly across organizational boundaries (Smeulders et al.,2023; Teece, 2000). Firms attempt to facilitate this transfer through learning (Schweizer et al., 2022), codification and socialization (Nonaka & Takeuchi, 1995; Nahapiet & Ghoshal, 1998; Bresman et al., 2010). What remains less understood is which organizational actors engage in these multiple processes and, more interestingly, what specific mechanisms they employ (Kroon et al., 2022).

Positioned between strategic leadership and operational teams, middle managers occupy a structurally unique dual role (Franck et al., 2025): absorbing and implementing top-down directives while simultaneously channelling ground-level intelligence and resistance upward (Floyd & Wooldridge, 1992; Balogun & Johnson, 2004; Tawse et al., 2024). Middle managers play key roles during PMI (Thelisson and Kin, 2021), yet frameworks stop short of theorizing and identifying the specific micro-level mechanisms by which actors shape knowledge transfer. While PMI outcomes are observable and discussed at the organizational level, the mechanisms that determine whether integration succeeds or fails are enacted through individual behaviours, interpersonal relationships, and the cumulative micro-decisions of middle managers operating under conditions of substantial uncertainty. We thus address this gap by interviewing middle managers from both acquirer and acquired; a unique dyadic perspective, responding to the growing call for micro-foundational research in M&A and organizational capabilities (Foss & Pedersen, 2019) and process-level theorizing in PMI (Graebner et al., 2017). The central research question guiding the study is: what is the role of middle managers in the transfer of capabilities during post-M&A integration?

Literature Review and Theoretical Framework

Firms may pursue acquisitions when they identify RBV or KBV-type resources that would require prohibitive time or investment to develop internally (Barney, 1991; Grant, 1991; Nonaka et al., 2000), if at all possible. Such motivations feed dynamic capabilities where firms, over time, attempt to reconfigure their sources of competitive advantage as part of their capacity to sense environmental shifts, seize emerging opportunities, and reconfigure their resource accordingly (Teece et al., 1997). As such, M&As constitute an accelerated learning mechanism through which firms acquire such embedded and path-dependent capabilities.

The critical challenge resides in PMI where the acquisition's strategic rationale must be translated into operational reality by securing such resources from across organizational boundaries and redeploying them - central to M&A value creation (Graebner et al., 2017). The difficulty is compounded by the nature of the knowledge most often at stake: capabilities that contribute to sustained competitive advantage are typically tacit, socially complex, and deeply embedded in the relationships and routines of the organizations that hold them (Teece, 2000), making them resistant to transfer through structural integration mechanisms alone.

Knowledge transfer in PMI: Two competing logics

Literature has converged on two broad strategic approaches to cross-firm knowledge transfers: codification and socialization. Codification treats knowledge as explicit know-how transferable through documentation, standard operating procedures, and training programs, among others (Davenport & Prusak, 2010; Zollo & Winter, 2002) to enable acquired employees to learn the acquiring firm's institutional knowledge and practices. This approach is appealing due to its scalability and consistency, effective for explicit knowledge, but lacking for relational and embedded knowledge necessary for strategic value. Socialization acknowledges the consequential, strategic knowledge transfers occur between individuals, through sustained conversation, observation, collaboration, and shared practice (Nonaka & Takeuchi, 1995). Social capital functions as both a conduit and a precondition for knowledge transfer (Nahapiet & Ghoshal, 1998); it is central to effective PMI knowledge transfer (Bresman et al., 2010). While slower and more difficult to systematize, it is substantially more effective for the tacit knowledge exchange that underlies competitive advantage. However, not all transfers are successful. Szulanski (2000) identifies four principal barriers: causal ambiguity of the actual knowledge; recipient's insufficient absorptive capacity; arduous relationship between source and recipient; and the recipient's limited motivation to learn. In a PMI context, understanding

which organizational actors assume responsibility for mitigating these barriers and through which mechanisms constitute a core theme to this paper.

Underexplored role of middle managers

Executive decision-making, leadership style, and strategic communication of top management have all been linked to PMI performance (Graebner et al., 2017). Sparse attention, however, has been devoted to middle managers who occupy a structurally distinctive position within organizations, receiving strategic direction from leadership to deploy frontline implementation while also simultaneously embedded in the operational fabric, possessing direct knowledge of their teams' absorptive capacity, managing informal resistance, and leveraging informal mechanisms to sustain operational continuity. Balogun and Johnson (2004) develop this further by demonstrating that middle managers are not passive implementers but active sensemakers, constructing interpretations of change before they can serve as guides as both champions and synthesizers (Floyd & Wooldridge, 1992).

For change management, Huy (2002) demonstrates that middle managers are critical to managing emotional dimensions of organizational transformation, sustaining morale and containing anxiety during significant disruptions. Tushman and O'Reilly's (1996) ambidextrous leadership characterizes the simultaneous management of operational continuity and strategic transformation of PMI, often resides with middle managers. Weick's (1995) sensemaking argues that in conditions of uncertainty and novelty, individuals construct meaning through action and retrospective interpretation; middle managers are organizational actors most appropriately positioned to facilitate this process for underlings.

The M&A literature has not yet produced a conceptual framework for understanding how middle managers shape PMI knowledge transfer. Thelisson and Kin (2021) conceptualized "interface managers" as mediators facilitating coordination between merging entities. However, their framework advances structural alignment and not micro-level mechanisms to explain how knowledge is transferred, interpreted, and adopted within integrating organizations. Birollo et al. (2024) identify self-mediation, interfirm mediation and stakeholder mediation of acquired and acquiring middle managers during various stages of PMI. We build upon this by identifying the specific behaviours, relational strategies, and organizational dynamics through which middle managers, from both sides, enable or constrain knowledge transfer simultaneously.

Conceptual framework

Drawing on the above theoretical perspectives, middle managers are positioned at the intersection of three dimensions: codification and personalization knowledge transfer mechanisms, structural and human integration continuum of Birkinshaw et al. (2000) and

Szulanski's (2000) knowledge transfer barriers. Middle managers are not only implementation agents but active architects that determine knowledge flows and which barriers are reduced or amplified in determining if integration ultimately achieves knowledge/capability transfer.

Three propositions guide our investigation. First, middle managers actively construct ad hoc knowledge transfer processes rather than merely executing integration protocols. Second, acquiring and acquired middle managers perform distinct yet complementary roles during PMI. Third, the effectiveness of knowledge transfer depends on middle managers' capacity to manage barriers, particularly those arising in the relationship between those transferring knowledge and the absorptive capacity of those receiving it.

Methodology

We adopt a qualitative, exploratory research design grounded in a constructivist epistemology as the phenomenon under investigation, namely the role of middle managers in knowledge transfer, is inseparable from the subjective experience and interpretive frameworks of the participants themselves (Yin, 2018; Shannon-Baker, 2023). Understanding how middle managers perceive their own role, construct meaning from the integration they are navigating, and describe their relationships with counterparts on both sides of the merger requires a methodology that privileges depth, context, and the multiplicity of meanings that different actors bring to the same organizational event.

A single-case study design was selected as the most appropriate research strategy for this purpose. Yin (2018) demonstrates that case studies are particularly well suited to investigating phenomena where the boundary between the subject and its context is blurred, a condition that applies directly to knowledge transfer in a live PMI. Trust, identity, informal learning, and resistance, key variables in change are not adequately accessible through surveys or archival data alone. Our objective is to understand process, not statistical generalizations, in developing insights into how middle managers shape knowledge transfer during PMI.

Case selection and sampling

The case is based on a 2023 acquisition in the Canadian professional services sector in which a large national firm (5,000+ employees) acquired a smaller regional firm (about 100 employees) operating within the same industry but different segments. The acquired firm had deep roots in its local community, a familial organizational culture, and a generalist, client-adaptive approach to service delivery that contrasted substantially with the acquiring firm's nationally standardized structure. These characteristics rendered the case particularly productive for studying

knowledge transfer across cultural and organizational boundaries. The firms remain anonymous in accordance with confidentiality and ethics requirements.

Saturation, consistent with established criteria for qualitative research of this scope (Sauvayre, 2013), was achieved at twenty-two semi-structured interviews with middle managers (10 from acquiring firm; 12 from acquired). Managers were selected through purposive sampling designed to ensure representation across departments, seniority levels, and degrees of involvement in PMI and provided informed consent prior to participation.

Data analysis

Data analysis followed case-based thematic methodology (Yin, 2018; Boutin, 2018), using five iterative stages: organizing data into thematic arrays, constructing contrast matrices to compare acquiring and acquired manager perspectives, developing visual displays of emerging patterns, tabulating the frequency of key events and behaviours, and ordering findings chronologically to trace the evolution of integration dynamics over time. All 22 interviews were transcribed verbatim and imported into NVivo for systematic coding. Initial line-by-line coding generated a preliminary analytical framework that was subsequently tested and refined against the full dataset through constant comparison. Quality assurance measures included detailed coding logs, researcher memos documenting analytical decisions, and triangulation across multiple participant accounts to verify the recurrence and consistency of key themes.

Results Analysis and Discussion

Middle managers do not passively implement knowledge transfer processes; they actively design and sustain them. The most conceptually significant mechanism emerging is what this study terms sensemaking by proxy. Weick (1995) defines sensemaking as the iterative process through which individuals construct meaning in conditions of uncertainty and organizational novelty. Middle managers do not engage in this process solely for themselves but on behalf of their teams as well. They absorb new processes and expectations, translate these into language and frames of reference their teams can understand, and re-articulate them in forms that reduce anxiety and enable knowledge adoption: *"I essentially translated things into our old language... I made sure they understood because I was speaking their language, so to speak. The message I conveyed to them felt safer, and they were more comfortable approaching me if they didn't understand something."* (Acquired Manager 40)

This constitutes sensemaking by proxy: not a relay of information but a genuine interpretive act mediating between the acquiring firm's operational expectations and the acquired firm's

cognitive and cultural reality. The process aligns with Nonaka and Takeuchi's (1995) concept of tacit knowledge articulation, extending that framework by locating the articulation not within formal knowledge management systems but in the relational and linguistic work of individual managers operating under significant time and emotional pressure. It also resonates with Balogun and Johnson's (2004) account of middle managers as change intermediaries who must construct their own understanding of change before they can serve as guides for those around them: *"When you're experiencing changes that are not so clear to you, it's not so easy to pass that on with the same level of confidence."* (Acquired Manager 19)

This micro-level finding carries direct macro-level implications: how a manager translates a new procedure for their team determines whether that procedure is adopted, adapted, or quietly disregarded. Organizational-level knowledge transfer represents the aggregate of these micro-interactions, which means that the quality of middle managers' sensemaking by proxy can greatly influence the outcome of PMI achieving its strategic objectives.

Formal and informal knowledge channels

Formal mechanisms for knowledge transfer, including buddy systems, video-based training, and standardized onboarding modules, were universally present in the studied integration but widely perceived as insufficient. Participants from the acquired firm described these mechanisms as impersonal, poorly timed, and disconnected from the practical demands of their work. Training deadlines coincided with the industry's peak operational season, rendering meaningful engagement with formal materials effectively impossible. As Acquired Manager 2 observed, the underlying tension is that formal knowledge transfer mechanisms are designed for individuals joining an organization without prior expertise, whereas acquired employees carry existing client relationships, professional competencies, and cognitive frameworks that require engagement rather than replacement.

In response to the inadequacy of formal mechanisms, acquired firm middle managers developed informal alternatives. Peer collaboration sessions, learning-by-doing arrangements, and ad hoc problem-solving forums emerged organically as the primary channels of effective knowledge transfer. These informal mechanisms align closely with the personalization approach described by Nonaka and Takeuchi (1995) and with Brown and Duguid's (1991) concept of communities of practice, in which knowledge is acquired through participation in shared activity rather than through formal instruction. Acquiring Manager 12 was explicit regarding the source of their team's integration success: reliance was placed primarily on interpersonal exchange rather than on training platforms or standardized documentation.

IT integration failures provided an illustration of middle managers' informal problem-solving capacity. Acquired firm employees lost access to critical workflow software and archival systems almost immediately following the transaction's close, effectively doubling their operational workload and preventing access to prior-year client files. Rather than awaiting centralized resolution, acquired middle managers devised practical workarounds: one created a remote desktop access arrangement that allowed acquired employees to retrieve files through retained credentials; others established temporary archival storage systems and negotiated more realistic procedural timelines with acquiring counterparts. These were not incidental gestures but acts of organizational leadership exercised without formal mandate, driven by operational necessity to maintain integration momentum.

Trust, relationships, and ambidextrous leadership

The study reveals a theoretically significant asymmetry in the leadership dynamics of acquiring and acquired middle managers, one that, to the authors' knowledge, no or little prior study had documented through simultaneous access to both perspectives within a single live integration. Acquiring middle managers operated in a predominantly proactive mode, initiating integration activities, structuring collaborative forums, driving standardization efforts, and managing the formal architecture of knowledge transfer. Their ambidexterity was oriented toward the organizational future, maintaining current operations while building the institutional infrastructure of the newly merged entity.

Acquired middle managers operated in a predominantly reactive mode, though this reactivity was no less organizationally consequential. They served as the primary absorbers of change within their teams, as emotional buffers between institutional disruption and frontline employees, and as advocates for their teams' needs within a power structure fundamentally not of their own making. Their ambidexterity was oriented toward organizational survival, maintaining team cohesion and operational continuity while personally navigating profound uncertainty regarding their own role, identity, and future within the merged organization: *"For me, it was difficult. As I was playing that transition role, helping people with transition. At the acquired firm I wore five different hats. I did a lot of and was in charge of a lot of different things."* (Acquired Manager 40)

This testimony reflects not only the scope of responsibilities acquired managers carried but the psychological burden of performing organizational stability for others while privately experiencing significant instability themselves. Huy (2002) and Franck et al. (2025) identify emotional intelligence as a core competency for middle managers in transformational contexts. We add to that claim: acquired managers maintain the outward projection of confidence and

continuity while internally managing PMI ambivalence, supporting the valuable, mediating role of middle managers (Birollo et al., 2024).

Trust operated as a central mediating mechanism reducing the barriers identified in knowledge transfer theory. Mayer et al.'s (1995) framework identifies three constitutive components of trust: benevolence, ability, and integrity. This study found clear empirical support for all three in the behaviours of effective middle managers on both sides of the acquisition. Managers who demonstrated genuine concern for their teams' wellbeing, who demonstrated competence in the new operational environment, and who maintained commitments over time were able to substantially reduce what Szulanski (2000) characterizes as the arduous relationship barrier, the interpersonal friction that prevents knowledge from flowing between source and recipient.

Effective middle managers socialization practices followed a recognizable pattern: managers created physical and relational proximity with their teams, extended their availability beyond formal role requirements, and engaged with employees on matters beyond immediate task demands. Some described this orientation plainly, emphasizing sustained physical presence and intentional investment in informal conversations regarding employees' interests and experiences beyond the workplace, noting that such elementary interpersonal contact proved meaningfully consequential for the overall quality of the integration.

Trust also revealed an important boundary condition. When acquired managers themselves experienced unresolved identity tensions with respect to PMI, they occasionally functioned as gatekeepers rather than as facilitators of knowledge transfer. Cultural disconnection at the middle manager level does not merely generate personal distress; it structurally disables the sensemaking by proxy function on which effective knowledge adoption depends. A manager unable to construct a coherent account of the new organizational culture for themselves cannot credibly translate it for their team, and the transfer processes dependent on that translation stall accordingly. One acquired manager gave direct expression to this dynamic, noting that the perception of cultural incompatibility, experienced both personally and among colleagues, rendered effective advocacy for the integration effectively impossible.

The acquiring and acquired distinction further structured the dynamics of knowledge mutuality. While the literature increasingly advocates for bilateral learning in post-acquisition contexts (Birkinshaw et al., 2000; Lee et al., 2023), the integration observed here was predominantly unidirectional. Knowledge originating in the acquired firm was incorporated into the acquiring firm's practices only when acquiring-side managers explicitly recognized its value, a recognition consistently filtered through assumptions of organizational superiority reinforced by the substantial size differential between the two firms. Perceived expertise in the acquired

organization is an insufficient condition for genuine knowledge reciprocity in the absence of structural arrangements that actively create space for it.

Barriers to knowledge transfer: Personal, organizational, and structural dimensions

The most pervasive personal barrier encountered in this study was professional identity threat. Empson (2001) has documented the phenomenon of identity loss in post-merger contexts, wherein employees of acquired organizations experience fundamental disruption to their sense of professional self. This study confirms and deepens that finding. Acquired employees did not resist new processes primarily on grounds of unfamiliarity; they resisted them because adoption felt like a repudiation of the expertise, culture, and collegial relationships through which they had constructed their professional identities over time. The persistent perception of an "Us vs. Them" division reported by multiple participants was not merely an expression of cultural friction but functioned as an identity defence mechanism, maintaining its force well beyond the early phases of integration.

Middle managers from the acquired firm occupied a particularly demanding position in this regard: they were simultaneously among the primary targets of identity disruption and the principal organizational actors expected to manage that disruption in others. This double bind imposed extraordinary demands on their cognitive and emotional resources. Critically, it produced a direct operational consequence: managers who had not resolved their own ambivalence concerning the acquisition were demonstrably less effective in facilitating their teams' adoption of new knowledge and practices. This implies that middle managers from acquired firms require structured support for their own identity transition as a precondition for their effectiveness in supporting that of their teams.

Organizational and structural barriers compounded personal ones. IT integration failures were the most immediately disruptive, preventing merging employees from accessing critical files and systems for extended periods. A parallel-systems environment emerged in order to maintain effective operations. These technical failures directly undermined absorptive capacity. Szulanski (2000) conceptualizes absorptive capacity barrier as a cognitive or organizational attribute of the recipient; this study suggests that it can be artificially generated and exacerbated by structural failures in the PMI process itself. This has direct implications for how integration readiness is assessed and sequenced.

The PMI coincided with a peak operational season, creating structural incompatibility between integration demands and operational realities, exceeding the capacity of even effective managerial intervention to resolve. Formal training programs were not perceived as opportunities for learning but as additional administrative burdens during a busy period,

supporting These findings build upon the work of Thomas et al. (2023) on the importance of adapting the speed of integration activities to the organizational context and tasks.

Personnel loss represented the most consequential structural barrier of all. The departure of key employees, driven by identity threat, professional burnout, and cultural incompatibility, created knowledge gaps that were, in some cases, irreplaceable. When experienced employees left, tacit knowledge, client relationships, and institutional memory left as well, impugning acquisition objectives of appropriating their knowledge. Moreover, departures increase operational workload of remaining staff, reducing available capacity for PMI activities, which in turn increases disengagement and resistance, precipitating further departures.

Taken together, these findings establish that PMI knowledge transfer is neither automatic, nor bilateral, nor value neutral. It constitutes a selective and politically negotiated process whose outcomes depend on which actors recognize, advocate for, and actively facilitate the movement of knowledge across organizational boundaries. The consistent finding that personalization mechanisms outperformed codification approaches in this context extends the conclusions of Szulanski (2000) and Bresman et al. (2010): the social architecture of knowledge transfer is at least as consequential as its technical infrastructure. Investments in relational mechanisms, including informal interaction, mentorship, and collaborative learning arrangements, may therefore generate greater integration outcomes than equivalent investments in standardized training systems. This supports Bauer et al., (2016) who distinguish between the speed of codified task and unique, tacit human integration and the necessary mechanisms to achieve each successfully.

Theoretical Contributions

This study advances the academic understanding of post-acquisition integration by repositioning middle managers from peripheral implementers to central architects of knowledge transfer. It makes three principal theoretical contributions. First, the concept of sensemaking by proxy extends Weick (1995) and Nonaka and Takeuchi's (1995) knowledge articulation framework by demonstrating that middle managers perform interpretive work not only on their own behalf but on behalf of their teams. This constitutes a genuine interpretive act rather than a relay function, and its quality has direct and consequential effects on whether organizational-level knowledge transfer succeeds or stalls.

Second, the dual role model developed here distinguishes between the complementary but non-interchangeable functions of acquiring and acquired middle managers. Acquiring managers serve as structural architects of integration: proactive, forward-oriented, and focused on creating the organizational conditions under which knowledge transfer can proceed. Acquired

managers serve as cultural and cognitive bridges: critically active in preserving institutional knowledge, managing identity disruption, and translating change for teams that experience it as a form of professional loss. This distinction, documented through simultaneous access to both perspectives within the same live integration, constitutes a methodological and theoretical contribution that extends the work of Thelisson and Kin (2021) by specifying the mechanisms through which intermediary managerial actors shape knowledge transfer rather than merely coordinating structural alignment.

Third, the findings reveal the political and socially negotiated character of knowledge transfer during PMI. Contrary to frameworks that treat transfer as a technical or procedural problem, this study demonstrates that it is a selective process shaped by recognition, power dynamics, organizational identity, and relational trust. Knowledge originating in the acquired firm is incorporated into acquiring firm operations only when acquiring-side managers recognize its value, a recognition that is filtered through cultural assumptions and organizational politics that formal integration plans rarely acknowledge. This finding extends Bresman et al. (2010) and Vaara (2003) and has direct implications for how organizations design and subsequently evaluate their integration strategies.

Underlying these contributions is a micro-macro logic rendered explicit throughout this paper. The strategic acquisition outcomes are macro-level phenomena observable at the organizational level, but produced through micro-level processes: individual conversations, informal training arrangements, trust-building practices, and the daily decisions of managers navigating profound uncertainty while simultaneously providing a stable institutional presence for those around them. By documenting these micro-foundations and linking them systematically to integration outcomes, this study responds to calls for micro-foundational research in M&A and organizational capabilities (Foss & Pedersen, 2019), and demonstrates that sustainable competitive advantage from M&A is ultimately enacted by middle managers' sensemaking, gestures, and informal interactions.

Managerial Implications

The findings carry several actionable implications for organizations navigating post-acquisition integration. Due diligence processes should be extended to encompass assessment of the target firm's learning culture and internal knowledge-sharing practices; understanding how knowledge circulates within the acquired organization is a prerequisite for designing an integration capable of channelling that knowledge effectively. IT integration must precede operational merger: the technical disruptions documented in this study were not incidental complications but structurally consequential failures that artificially suppressed absorptive

capacity during the period of greatest need. Middle managers should be engaged as co-designers of integration strategy rather than as implementers of decisions made without their involvement; their ground-level understanding of where knowledge resides, where resistance is located, and which informal mechanisms are already functioning effectively constitutes among the most valuable inputs available to integration planners. Finally, integration activities should be sequenced with explicit regard for the acquired firm's operational calendar; scheduling major change initiatives during peak operational periods constitutes a structural planning decision that demonstrably reduces absorptive capacity and elevates the probability of both resistance and personnel departure.

Limitations and Future Research

Interviews were conducted during integration, capturing the immediacy and texture of participants' experiences but precluding longer-term outcome assessment; additional longitudinal research would clarify whether the identified informal knowledge transfer proved durable or required more formal institutionalization for capability development. Future research should focus on the micro-foundations of capability transfer, particularly individuals' cognitive and identity dynamics that this study surfaced but did not fully explore. Additionally, the increasing prevalence of remote work raises substantive questions as to how social proximity and informal interaction can be meaningfully replicated at a distance, raising significant implications for knowledge transfer.

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LEARNING-ORIENTED LEADERSHIP IN HYBRID WORKPLACES

Ebojoh, Sandra[1]; Högberg, Karin[1]
[1]School of Business, Economics and IT, University West, Trollhättan, Sweden

Keywords: Hybrid workplaces, Hybrid work, Learning, Learning-oriented Leadership, Social constructivism, Knowledge-intensive organizations, Longitudinal study, Sweden.

Introduction

The shift to hybrid work enabled by digital technologies has transformed workplaces, disrupted organizational structures, altered workplace learning, and challenged leadership (Teng-Calleja et al., 2023; Vallo Hult and Byström, 2022). This transformation requires new ways of organizing and learning, as employees face increasingly complex and dynamic work environments that demand continuous learning and training (Högberg and Willermark, 2024). The disruption of practices as employees switch between on-site and remote work in hybrid workplaces highlights the need for learning and leadership that supports employee learning. Learning-oriented leadership, a distinct leadership approach that promotes employee learning, has been studied in traditional work settings; however, further research is needed on how it is implemented in hybrid workplaces with challenges such as learning transfer, teamwork, and team learning (Wallo et al., 2022; Peprah, 2024; Wallo et al., 2024). Through social constructivism and the learning-oriented leadership framework, this study aims to increase the understanding of learning-oriented leadership in the transition to hybrid workplaces. The formulated research question is: How does the transition to hybrid workplaces affect learning-oriented leadership over time?

Literature Review and Theoretical Framework

In social constructivism, learning is socially mediated; knowledge is constructed through interactions with others; meaning is negotiated from multiple perspectives; and the importance of context is emphasized (Chuang, 2021). Employees perceive their workplaces as learning environments, where they construct the knowledge necessary for their working lives through participation in daily activities (Billett, 2004). However, in hybrid workplaces, the nature of workplace interactions has shifted; learners' behaviors manifest differently (Rigolizz*o,* 2023), and social norms and shared contexts have changed due to the greater reliance on digital tools. Learning-oriented leadership encompasses all behaviours that a leader can exhibit to promote

employee learning in the workplace (Lundqvist et al., 2023). The learning-oriented leadership framework delineates the leadership practices and conditions that influence employee learning and outcomes, making it pertinent for studying learning in hybrid workplaces.

Methodology

This qualitative longitudinal study follows recommendations in this research area (Lundqvist et al., 2023) and examines two large knowledge-intensive organizations (KIOs) in Sweden that are transitioning to hybrid workplaces. Data collection began in September 2023, with an expected end in September 2026, and includes 33 semi-structured interviews, 3 focus group sessions, and 203 hours of non-participant observation of leaders and co-workers of both organizations.

Main/Expected Findings and Contribution

Some preliminary themes identified through thematic analysis include hybrid work practices, learning challenges, adaptations, leadership changes, and learning outcomes.

Originality and Value

This study extends the learning-oriented leadership framework to hybrid work contexts and refines the understanding of social constructivism in digitally mediated work environments.

Research Limitations

This study focuses on two high-tech firms, and the insights may apply more broadly to KIOs transitioning to hybrid workplaces.

Theoretical and Practical Applications/Implications

This study offers practical guidance for organizations and managers leading knowledge-intensive work and shifting to hybrid workplaces.

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BRIDGING THE GAP OR WIDENING THE DIVIDE? THE ROLE OF DOMAIN EXPERTISE IN AI-ASSISTED VENTURE CREATION

Gil-Or, Oren[1]

[1]School of Management & Economics, The Academic College of Tel Aviv-Yaffo, Tel Aviv-Yaffo, Israel

Keywords: Domain Expertise, Artificial Intelligence, MBA Curriculum, EdTech, Venture Creation, Absorptive Capacity, Knowledge Management.

Introduction

Generative AI is often hailed as an 'equalizer' allowing novices to perform at expert levels. In entrepreneurship education, this implies that any student equipped with ChatGPT can generate a viable business model. This study challenges that assumption by empirically examining how domain expertise influences the quality of AI-assisted ideation. Does AI help novices 'catch up' or accelerate experts?

Purpose, Aim and Objectives

The aim is to investigate the "Expertise Gap" in AI usage. The research questions are: (1) How does domain expertise influence the specificity of prompts? (2) Can GenAI effectively compensate for a lack of industry knowledge in novice entrepreneurs?

Literature Review and Theoretical Framework

Drawing on Absorptive Capacity (Cohen and Levinthal, 1990), we posit that recognizing information’s value depends on prior knowledge. While AI provides access to infinite information, this framework posits that only users with high absorptive capacity can curate it into a coherent strategy. Furthermore, recent research on the "jagged frontier" of AI (Dell’Acqua et al., 2023) suggests that while AI improves the performance, it requires expert oversight to reach the ceiling of quality. This aligns with Cognitive Load Theory (Sweller, 1988), suggesting that domain schemas are essential for managing the cognitive friction of AI-human co-creativity.

Methodology and Methods

The research analyzes a dataset of **40 transcripts** of MBA students interacting with an AI venture coach. Students were categorized based on the alignment between their professional background and their chosen venture: "Novices" (no relevant background) vs. "Experts" (relevant background, e.g., a biotech engineer proposing a fermentation lab). The resulting business models were evaluated for specificity and technical feasibility.
To ensure analytical rigor, an AI-assisted thematic analysis was conducted across all 40 transcripts. Expertise was operationalized by aligning CV-verified backgrounds with venture domains, while a 5-point Likert rubric assessed 'Technical Specificity'. The AI served as a second coder, achieving an 86% agreement rate, ensuring a transparent and reliable interpretation.

Main Findings and Contribution

Quantitative analysis of the full dataset (N=40) confirms the 'Amplification Effect'. Experts (N=24) performed 3.8x more iterative loops than novices (N=16). While novices consistently fell into 'validity traps' by accepting generic AI outputs, experts actively challenged hallucinations using specific domain parameters, demonstrating that AI amplifies expertise rather than compensating for its absence.

The findings reveal that AI does not compensate for lack of expertise, it exposes it.

- ***Novice behavior (The "Hallucination trap")*:** Novices engaged in linear, accepting dialogues. When the AI suggested generic ideas (e.g., "an app for hospital load management"), novices accepted the features without challenge. The resulting business models were superficially coherent but lacked "insider" nuance, often missing critical regulatory hurdles.
- ***Expert behavior (The "Amplification effect")*:** Experts engaged in cyclical, corrective dialogues. For example, a student with a background in HR explicitly rejected the AI's privacy concerns based on regulatory knowledge, while a satellite engineer constrained the AI to specific launch protocols.

The study contributes the insight that AI acts as an amplifier of domain expertise. For experts, it is a force multiplier but for novices, it is a "validity trap" that produces plausible but mediocre ideas.

Originality and Value

This paper provides a critical counter-narrative to the "AI as a crutch" discourse. It highlights that the most valuable entrepreneurial AI interactions occur after students have acquired hard skills, not before.

Research Limitations

The sample size (N=40) is qualitative and context-specific. The study focuses on early-stage ideation and does not track long-term venture success.

Theoretical and Practical Implications

The implication for business schools is profound: integrating AI into the curriculum requires a renewed focus on deep industry knowledge. Students must be experts in the problem space to effectively employ AI in the solution space. Curricula should shift focus from general "ideation" workshops to "domain-specific AI application."

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HOW CONVERSATIONAL AI IS TRANSLATED INTO BUSINESS VALUE: AN EMPIRICAL STUDY FROM AI INTEGRATORS' PERSPECTIVE

Popa, Simona[1*]; Soto-Acosta, Pedro[2]; Ros-Gálvez, Alejandro Daniel[3]

[1] Department of Accounting and Financial Economics, University of Murcia, Murcia, Spain

[2] Department of Business Administration and Finance, University of Murcia, Murcia, Spain

[3] Faculty of Economics and Business, International University of La Rioja, Logroño, Spain

Keywords: Artificial Intelligence, Conversational AI, Value Creation, Context-Mechanism-Outcome, Task-Technology Fit

Abstract

Purpose, aim and objectives: Conversational artificial intelligence (AI) is increasingly deployed across industries to automate service interactions, support employees, and personalize customer engagement. This study examines conversational AI implementations led by global AI integrator firms that translate AI capabilities into business applications.

Literature review and theoretical framework: Despite widespread adoption, limited research explains how conversational AI creates organizational value. To address this gap, the study draws on Task-Technology Fit (TTF) theory and the Context-Mechanism-Outcome (CMO) approach to capture the configurational nature of value creation in conversational AI implementations.

Methodology and methods: The study applies a qualitative multi-case research design focusing on conversational AI projects implemented by global AI integrator firms. The analysis covers 24 conversational AI projects across multiple industries and regions. Systematic CMO analysis and cross-case comparison is used to identify recurring value-creation configurations.

Main findings and contribution: We identify five dominant value-creation configurations: (1) customer service automation at scale, (2) AI-powered knowledge assistance, (3) human–AI service augmentation, (4) proactive engagement and personalization, and (5) integrated process orchestration. The findings provide an empirically grounded explanation of how conversational AI translates into business value.

Originality and value: This research advances theory by integrating TTF with configurational realist logic and offers practitioners actionable design principles for AI implementation that create business value.

Introduction

Conversational artificial intelligence (AI), defined as software systems that interact with users through natural language dialogue, has emerged as a central component of contemporary digital transformation initiatives. Advances in machine learning, natural language processing, and, more recently, large language models have enabled conversational agents to move beyond simple rule-based chatbots toward systems capable of intent recognition, contextual dialogue management, and generative responses (Arora et al., 2023; Van Pinxteren et al., 2020). As a result, conversational AI is now widely deployed across industries such as retail, banking, telecommunications, healthcare, and public administration to automate customer service, support employees, and personalize interactions at scale (Mariani et al., 2023).

From a managerial perspective, conversational AI is frequently promoted as a technology that can simultaneously reduce operational costs, improve service quality, and enable new forms of customer engagement. Prior studies and industry evidence suggest that conversational agents can provide round-the-clock service availability, reduce waiting times, and handle high volumes of routine inquiries, thereby lowering cost-to-serve and improving customer satisfaction (Adam et al., 2021; Zhang et al., 2024). Beyond customer-facing applications, organizations increasingly deploy conversational AI internally to support employees in tasks such as knowledge retrieval, IT support, and human resource inquiries, with reported gains in productivity and consistency (Dutta et al., 2023; Pillai and Sivathanu, 2020). These developments have contributed to strong expectations regarding the business value of conversational AI.

Despite this growing adoption, academic understanding of how conversational AI creates organizational value remains limited and fragmented. Much of the existing literature focuses on micro-level issues such as user perceptions, trust, anthropomorphism, and intention to use (Guha et al., 2023; Van Pinxteren et al., 2020). While this work is essential for understanding adoption and interaction quality, it offers only partial insight into organizational-level outcomes such as efficiency gains, cost reduction, or innovation. Other studies document potential benefits but often treat value creation as a direct or universal consequence of deployment, without specifying the

conditions under which these benefits materialize (Mariani et al., 2023). As a result, organizations continue to experience mixed outcomes: while some conversational AI initiatives deliver measurable performance improvements, others fail to meet expectations or even generate negative user experiences (Zhang et al., 2024).

A central reason for these divergent outcomes lies in the contingent nature of conversational AI value creation. Conversational AI systems differ substantially in their capabilities, ranging from simple FAQ retrieval to transaction execution, proactive engagement, and real-time human assistance. Likewise, organizational tasks vary in structure, complexity, and required levels of human judgment. Prior research in information systems has long emphasized that the performance impact of technology depends on how well technological capabilities align with task requirements. Task-Technology Fit (TTF) theory formalizes this insight by arguing that information technologies improve performance only when their functionalities match the tasks users must perform (Goodhue and Thompson, 1995; Muchenje and Seppänen, 2023). When the fit is low, the adoption of technology may still occur, but performance benefits are limited or absent.

In addition to task-technology alignment, conversational AI implementations are embedded in complex organizational contexts. Factors such as industry characteristics, regulatory requirements, legacy IT systems, data availability, and organizational readiness shape both design choices and outcomes. To account for this complexity, scholars increasingly call for approaches that move beyond simple cause–effect models toward configurational explanations of digital innovation outcomes (vom Brocke et al, 2025). The Context–Mechanism–Outcome (CMO) framework from realist evaluation offers such an approach by emphasizing that interventions work through specific mechanisms that are activated only under certain contextual conditions, producing particular outcomes (Dalkin et al., 2015; Pawson and Tilley, 1997). While CMO logic has been applied in domains such as healthcare and public policy, it has rarely been used to analyze AI-enabled information systems.

This study addresses these gaps by examining how conversational AI creates business value through the combined lenses of TTF and CMO logic. Rather than asking whether conversational AI is valuable in general, we ask how, when, and why different conversational AI solutions lead to specific organizational outcomes. We focus on implementations led by global AI integrator firms, which play a critical role as technology transfer intermediaries by translating advanced AI capabilities into operational solutions for client organizations (Caloffi et al., 2023; Howells, 2006).

These firms operate across industries and geographies, making them uniquely positioned to observe recurring patterns of success and failure in conversational AI deployments.

The study draws on a qualitative multi-case analysis of 24 conversational AI implementations conducted by nine global AI integrator firms between 2018 and 2024. By analyzing these cases using realist CMO logic, we identify recurring configurations that link implementation context, conversational AI mechanisms, and organizational outcomes. This approach allows us to develop mid-range theoretical explanations of conversational AI value creation that are grounded in empirical evidence while remaining generalizable across settings (Eisenhardt, 1989). Accordingly, the study is guided by two research questions:

RQ1: How do conversational AI solutions create business value in organizations, and through which mechanisms is this value realized?

RQ2: Under what contextual conditions do specific conversational AI capabilities lead to successful outcomes, and how does task-technology fit influence these results?

By answering these questions, the study makes three contributions. First, it advances conversational AI research by providing a structured, empirically grounded account of value creation mechanisms, moving beyond adoption-focused perspectives. Second, it extends TTF theory to the domain of conversational AI by demonstrating how different AI roles, such as automation, assistance, augmentation, and orchestration, align with distinct task profiles. Third, it introduces a configurational, realist perspective to the study of AI-enabled information systems, highlighting how context conditions shape outcomes. For practitioners, the findings offer an evidence-based framework for diagnosing organizational contexts and designing conversational AI solutions that are more likely to deliver sustainable business value.

Theoretical Framework

Conversational AI and value creation

Conversational AI has become an increasingly important class of information systems due to its ability to mediate interactions between organizations and users through natural language. Prior research shows that organizations deploy conversational AI to achieve multiple objectives, including improving service efficiency, reducing operational costs, enhancing customer experience, and supporting employees in knowledge-intensive tasks (Mariani et al., 2023). These

systems are particularly attractive in contexts characterized by high interaction volumes, information asymmetries, and pressure for scalability.

Previous empirical studies indicate that conversational AI can generate operational value by automating routine interactions, such as frequently asked questions or standardized service requests, thereby reducing workload for human agents and lowering cost-to-serve (Adam et al., 2021). At the same time, conversational AI can improve customer experience by offering immediate responses and extended availability (Zhang et al., 2024). In internal organizational settings, conversational AI is increasingly used to support employees by providing access to policies, procedures, and technical knowledge, which can improve productivity and decision quality (Dutta et al., 2023; Pillai and Sivathanu, 2020).

Beyond efficiency gains, conversational AI has been associated with more strategic forms of value creation. By enabling personalized, data-driven interactions at scale, conversational AI systems can support sales, marketing, and customer engagement activities, contributing to higher conversion rates and improved retention (Aggarwal et al., 2025). Conversational interfaces can also function as sensing mechanisms, capturing rich interaction data that organizations can analyze to identify customer needs, service bottlenecks, and innovation opportunities (Mariani et al., 2023). These capabilities suggest that conversational AI can act not only as an automation tool but also as a source of organizational learning and innovation.

However, the previous literature also documents significant limitations and risks. Conversational AI systems may fail when they encounter ambiguous, emotionally charged, or out-of-scope queries, leading to user frustration and erosion of trust (Zhang et al., 2024). Service failures, such as inaccurate responses or repeated misunderstandings, can reduce users' intention to reuse conversational agents, even when availability and speed are high. These mixed outcomes highlight that conversational AI does not automatically create value; rather, its impact depends on how it is designed, deployed, and embedded in organizational processes.

Task-Technology Fit approach and Context-Mechanism-Outcome perspective

We ground our study in the TTF and CMO perspective, two complementary frameworks well-suited to understanding conversational AI value creation. To be more specific, TTF theory offers a foundational framework for explaining the performance impact of information systems. Originally articulated by Goodhue and Thompson (1995), TTF posits that technology improves

individual or organizational performance when its functionalities align with the requirements of the tasks it supports. The theory emphasizes that utilization alone is insufficient; performance gains occur only when the technology provides the right capabilities for the task at hand.

TTF research typically conceptualizes tasks in terms of characteristics such as complexity, structure, interdependence, and information requirements, while technology is characterized by its functionalities, reliability, accessibility, and integration capabilities (Goodhue and Thompson, 1995; Zigurs and Buckland, 1998). When task demands and technological capabilities are aligned, users are more likely to use the system effectively, leading to improved outcomes such as efficiency, accuracy, and productivity. Conversely, misfit can result in low utilization, workarounds, or even negative performance effects.

In the context of conversational AI, task-technology alignment is particularly salient. Conversational AI systems vary widely in their capabilities, ranging from basic informational chatbots to advanced assistants capable of executing transactions, orchestrating workflows, or augmenting human decision-making. At the same time, organizational tasks differ in their level of structure and need for human judgment. For example, answering standardized policy questions or resetting passwords represents highly structured tasks with clear rules and outcomes, which are well suited to conversational AI automation. In contrast, tasks involving negotiation, empathy, or complex problem-solving often require human involvement and may benefit more from AI augmentation than full automation (Davenport et al., 2020; Lin et al., 2025).

Although TTF theory has been applied to domains such as decision support systems, groupware, and analytics, its application to conversational AI remains underdeveloped, although recent work hints at the relevance of this perspective. For example, research on customer service chatbots suggests that conversational agents perform best when handling repetitive and well-defined inquiries, while human agents remain essential for complex or emotionally sensitive interactions (Lin et al., 2025). Similarly, studies on generative AI-based assistants suggest that user satisfaction and continued use depend on whether the system supports users' actual task needs rather than offering generic conversational capabilities (Chakraborty et al., 2025). However, these insights are often fragmented and not systematically linked to organizational performance outcomes.

Applying TTF to conversational AI highlights that value creation depends not only on deploying advanced AI models but also on selecting appropriate conversational roles for specific tasks. A conversational AI designed for knowledge retrieval may deliver substantial value in information-

intensive contexts but perform poorly if used for transaction-heavy processes without sufficient system integration. Likewise, deploying a fully autonomous chatbot in a context requiring human discretion may reduce service quality rather than improve it. These observations underscore the need to examine conversational AI value creation through a task-sensitive lens.

Furthermore, we complement TTF with the CMO framework from realist evaluation (Pawson and Tilley, 1997). In realist terms, context refers to the organizational, institutional, and technological conditions under which an intervention is implemented, such as industry characteristics, regulatory requirements, data availability, and legacy systems (Greenhalgh and Manzano, 2022). Mechanisms are the processes through which the intervention produces effects, including users' reasoning, behaviors, and interactions with the technology (Dalkin et al., 2015). Outcomes are the resulting changes, such as improved efficiency, satisfaction, or financial performance. In this sense, the CMO framework is particularly well suited to studying conversational AI because these systems are socio-technical interventions whose effects depend on user engagement, organizational processes, and technological configuration. For example, a conversational AI system may improve customer satisfaction (outcome) because it enables instant responses (mechanism), but only in contexts where users value speed over human interaction and where the system has access to accurate information (context). Without these contextual conditions, the same mechanism may fail to generate positive outcomes.

Although realist approaches have been widely applied in healthcare and public-sector research, they have rarely been used to analyze information systems or AI implementations. However, recent IS research increasingly recognizes the need for configurational explanations that capture how combinations of factors produce outcomes, rather than assuming linear causality (vom Brocke et al, 2025). The CMO framework aligns with this perspective by emphasizing that "what works" depends on "for whom" and "under what conditions."

Methodology

This study adopts a qualitative multi-case study design to examine how conversational AI creates business value in organizational settings. Case study research is particularly suitable for investigating complex socio-technical phenomena embedded in real-world contexts, where boundaries between the phenomenon and its environment are not clearly defined (Yin, 2018). Conversational AI implementations involve interactions between technology, organizational

processes, and human actors, making them well suited to in-depth, contextual analysis. The IA implementation projects were documented based on post-implementation evaluations that capture the integrators' perspective.

A multiple case design was chosen to enable cross-case comparison and theory building. Compared to single-case studies, multiple cases enhance analytical generalization by revealing recurring patterns and configurations across different contexts (Eisenhardt, 1989). Rather than aiming for statistical generalization, the study seeks to develop mid-range theory that explains how and why conversational AI creates value under specific conditions.

The empirical setting of the study consists of conversational AI implementations led by global AI integrator firms. These firms act as technology transfer intermediaries by adapting, implementing, and embedding advanced AI technologies within client organizations (Howells, 2006). Focusing on integrator-led projects provides access to a wide range of industries, use cases, and organizational contexts, while holding constant the role of professional intermediaries in solution design and deployment. Nine global AI integrator firms were selected through purposive sampling based on three criteria: (1) demonstrated experience in delivering conversational AI solutions, (2) engagement in projects across multiple industries and geographies, and (3) involvement in end-to-end implementation rather than isolated pilot initiatives. The selected firms operate in sectors including financial services, telecommunications, healthcare, retail, manufacturing, and public administration, and are headquartered in North America, Europe, and Asia. Across these firms, we analyzed 24 conversational AI implementation cases. Each case involved the deployment of a conversational interface as a core component of the solution. The cases span both customer-facing and internal organizational applications, including service automation, knowledge assistance, employee support, sales enablement, and process orchestration. This diversity allowed us to capture variation in task types, organizational contexts, and AI capabilities.

Data were analyzed using a realist CMO logic, which focuses on identifying how specific mechanisms generate outcomes under particular contextual conditions (Dalkin et al., 2015; Pawson and Tilley, 1997). This approach is well suited to studying conversational AI because it allows us to explain not only whether value is created, but how and under what circumstances it emerges. We developed an initial CMO codebook informed by prior realist evaluation studies and information systems research. Context codes captured organizational and problem-related conditions such as high interaction volume, cost pressure, knowledge fragmentation, regulatory

complexity, and legacy IT constraints. Mechanism codes represented key conversational AI capabilities and roles, including informational assistants, transactional agents, knowledge retrieval systems, agent-assist co-pilots, proactive outreach agents, and workflow orchestration assistants. Outcome codes captured operational, customer, financial, and organizational effects, such as cost reduction, productivity improvement, customer satisfaction, and innovation. Coding was conducted iteratively using qualitative content analysis. In the first phase, we performed within-case analysis, constructing a CMO narrative for each case that linked contextual conditions to conversational AI mechanisms and reported outcomes. This step helped preserve case-level richness and ensured that mechanisms were interpreted in relation to specific organizational settings.

In the second phase, we conducted cross-case analysis to identify recurring patterns across cases by examining which combinations of contexts and mechanisms were consistently associated with similar outcomes. This configurational analysis allowed us to move beyond individual cases and identify a small number of higher-order CMO configurations that explain conversational AI value creation across settings.

Findings

The cross-case analysis revealed five recurrent CMO configurations through which conversational AI creates business value: (1) automating routine customer service at scale, (2) providing AI-powered knowledge assistance, (3) augmenting human service work, (4) enabling proactive and personalized engagement, and (5) orchestrating integrated business processes. Each configuration represents a distinct pattern in which specific organizational contexts activate conversational AI mechanisms that, when aligned with task requirements, generate consistent outcomes.

The first configuration emerges in contexts characterized by high volumes of routine customer inquiries, significant service backlogs, and strong pressure to reduce operating costs. These conditions are common in industries such as telecommunications, retail, insurance, and utilities, where customer service organizations must handle thousands of repetitive requests daily. Typical problems include long waiting times, inconsistent service quality, and rising cost-per-contact. The mechanism that generates value in this configuration is the deployment of conversational AI as an automated service agent capable of answering frequently asked questions and executing standardized transactions. These conversational agents rely on structured knowledge bases and

backend system integrations to handle tasks such as account inquiries, password resets, order tracking, or appointment scheduling. The fit in this configuration is high because the underlying tasks are highly structured, predictable, and rule-based, aligning well with the strengths of conversational AI in pattern recognition and rapid response generation (Adam et al., 2021). Across cases, this configuration consistently produced operational and customer-related outcomes. Organizations reported increased containment and automation rates, extended service availability through 24/7 support, and reductions in average handling time and cost-to-serve. From a customer perspective, faster response times and immediate resolution of simple requests contributed to improved satisfaction, provided that the conversational AI delivered accurate and reliable responses (Zhang et al., 2024). However, cases also indicated that value was contingent on clearly defining the scope of automation and implementing effective handover mechanisms for out-of-scope inquiries, underscoring the importance of maintaining task-technology alignment.

The second configuration is observed in knowledge-intensive contexts where employees or customers struggle to access relevant information at the point of need. These settings are characterized by fragmented documentation, complex policies, regulatory requirements, or large repositories of unstructured content. Common examples include internal support functions, compliance-related inquiries, and technical or policy-driven service environments. The core mechanism in this configuration is conversational AI functioning as a knowledge retrieval and grounding assistant. Users interact with the system through natural language queries, and the AI retrieves, synthesizes, and reformulates information from enterprise knowledge bases, documents, or policy repositories. This configuration generally led to improved first-contact resolution, faster decision-making, and reduced reliance on subject-matter experts. Employees reported productivity gains due to reduced time spent searching for information, while organizations benefited from more consistent and compliant responses in regulated contexts (Pillai and Sivathanu, 2020).

The third configuration arises in complex or high-stakes service environments where tasks require human judgment, empathy, or contextual reasoning, making full automation undesirable or infeasible. These contexts include advanced customer service interactions, sales support, and internal decision-making processes. Common challenges involve cognitive overload for employees, inconsistent service quality, and long resolution times. Rather than replacing human workers, the conversational AI mechanism in this configuration operates as an agent-assist or co-pilot system. The AI supports human agents in real time by suggesting responses, retrieving

relevant information, summarizing interaction history, or automating routine subtasks. This configuration reflects a good fit of conversational AI handling structured subtasks and information processing, while humans retain responsibility for judgment-intensive aspects (Davenport et al., 2020; Lin et al., 2025). The outcomes associated with this configuration include improved agent productivity, greater consistency in service delivery, and enhanced customer experience. Employees reported reduced cognitive effort and increased confidence when supported by AI recommendations, while customers benefited from faster and more accurate responses without losing access to human interaction.

The fourth configuration is found in contexts where organizations seek to create value through anticipatory and personalized interactions rather than purely reactive service. These environments are characterized by missed revenue opportunities, delayed user actions, or low engagement resulting from generic communication. The conversational AI mechanism in this configuration involves proactive outreach and personalized guidance. Instead of waiting for users to initiate contact, the AI triggers interactions based on events, behavioral data, or predefined rules, offering reminders, recommendations, or tailored assistance. The fit is strong because AI systems can continuously monitor data streams and generate timely, personalized messages at scale, a task that is difficult to perform manually (Aggarwal et al., 2025). Empirical outcomes include increased user engagement, higher completion rates for targeted actions, and improvements in conversion or retention. For example, proactive reminders reduced process delays, while personalized recommendations supported more effective sales interactions. However, the configuration's effectiveness depended on contextual factors such as data availability, user consent, and perceived relevance. In contexts where proactive messages were poorly timed or insufficiently personalized, users perceived them as intrusive, reducing their effectiveness.

The fifth configuration emerges in contexts characterized by complex, multi-step processes and fragmented IT landscapes. These environments often involve legacy systems, manual handoffs, and high coordination costs, leading to slow turnaround times and operational errors. In this configuration, conversational AI functions as a workflow orchestration layer that translates natural language input into coordinated actions across multiple backend systems. The AI collects required information, applies business rules, and triggers integrations with enterprise systems such as ERP or CRM platforms. This mechanism demonstrates high fit of conversational AI for process coordination tasks, as conversational AI simplifies access to complex workflows while abstracting

underlying system complexity. Outcomes associated with this configuration include reduced process cycle times, fewer errors, and improved operational efficiency. Organizations also reported greater agility, as conversational interfaces enabled faster adaptation of processes without extensive user retraining. Beyond efficiency, this configuration contributed to organizational innovation by redefining how users interact with enterprise systems (vom Brocke et al, 2025).

Conclusions

This study sets out to explain how conversational AI creates business value in organizations, moving beyond adoption-focused perspectives to examine the mechanisms and conditions through which value is realized. Drawing on TTF theory and a realist CMO perspective, we analyzed 24 conversational AI implementations delivered by global AI integrator firms across industries and regions. The findings reveal that conversational AI does not generate value uniformly; rather, value emerges through distinct configurations in which conversational AI mechanisms align with task requirements and are activated within enabling organizational contexts.

Operational efficiency gains, improved customer satisfaction, enhanced employee productivity, revenue-related benefits, and organizational innovation were all observed, but only when the conversational AI mechanism was appropriate for the task and context. In addition, the findings underscore the centrality of TTF in conversational AI success. Highly structured and repetitive tasks were well suited to automation, while complex or high-stakes tasks benefited most from human–AI augmentation rather than full autonomy. Importantly, the study highlights that fit is not binary but can be complementary, as seen in augmentation scenarios where value arises from an effective division of labor between humans and AI.

By integrating TTF with a realist CMO perspective, the study contributes a configurational explanation of conversational AI value creation. Rather than assuming linear causality, the findings show that outcomes result from combinations of contextual conditions and AI mechanisms. For example, the same conversational AI capability produced different outcomes depending on data quality, organizational readiness, regulatory constraints, or user expectations. This configurational view advances information systems research by demonstrating how realist evaluation logic can be applied to digital and AI-driven interventions, a domain where such approaches remain underutilized. The study also contributes to the literature on technology transfer and innovation intermediaries. By focusing on global AI integrator firms, we show that successful conversational

AI deployment involves more than technology implementation. These firms act as translators and configurators, aligning AI capabilities with organizational tasks, redesigning processes, and managing change. In doing so, they play a critical role in converting advanced AI technologies into realized business value. This insight reinforces the view of innovation intermediaries as active shapers of value creation rather than passive conduits of technology.

From a practical perspective, the five configurations identified in this study provide an evidence-based framework that organizations and AI integrator firms can use to guide conversational AI initiatives. Rather than adopting conversational AI as a generic solution, practitioners can diagnose their organizational context, identify the dominant task challenges, and select conversational AI roles that exhibit strong task-technology fit. This approach can help manage expectations, reduce implementation risk, and increase the value creation.

This study has also limitations that open avenues for future work. First, the findings are based on qualitative case evidence. Future research could complement this work with quantitative studies that measure task-technology fit and performance outcomes across larger samples of organizations. Experimental or longitudinal designs could further strengthen causal inference. Second, while the study captures a broad range of industries and use cases, it focuses on integrator-led implementations. Future studies could examine conversational AI deployments developed in-house or by smaller vendors to assess whether similar configurations emerge. Third, rapid advances in generative AI are likely to expand conversational AI capabilities, potentially giving rise to new configurations. Ongoing research should examine how evolving AI technologies reshape task-technology boundaries and organizational value creation.

In conclusion, this study demonstrates that conversational AI can be a powerful driver of organizational value when deployed with a clear understanding of task requirements and contextual conditions. By offering a theoretically grounded and empirically validated framework, the study advances scholarly understanding of conversational AI while providing actionable guidance for organizations navigating AI-enabled digital transformation.

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DIGITAL TRANSFORMATION AND ALTERNATIVE FINANCING, TOWARDS MORE SUSTAINABILITY FOR NGOS: A LITERATURE REVIEW

Bachir, Joya[1]; Chedrawi, Charbel[2]; Petros, Lois[3]

[1]Department of Accounting, Economics and Finance, University of Nicosia, Nicosia, Cyprus

[2]Faculty of Business and Management, Saint Joseph University, Beirut, Lebanon

[2]School of Business, University of Nicosia, Nicosia, Cyprus

[3]Department of Accounting, Economics and Finance, University of Nicosia, Nicosia, Cyprus

Keywords: Digital Transformation – Alternative Financing – NGO – RDT – TOE – Sustainability.

Abstract

Purpose, aim and objectives: This study addresses a critical gap in the adoption of digital transformation within the non-governmental organization (NGO) sector, where technology utilization remains limited and progresses slowly compared to other sectors. NGOs often face structural constraints, including limited technical capacity and resource scarcity, which hinder their ability to adopt and effectively implement digital solutions. At the same time, the sector is characterized by unstable and unpredictable funding streams, largely due to dependence on traditional donors and grants, which negatively impacts organizational sustainability and long-term planning.

Literature review and theoretical framework: Drawing on Resource Dependency Theory (RDT) and the Technology-Organization-Environment (TOE) framework, the study proposes a theoretical model that explains how technological adoption, when aligned with innovative financing approaches such as crowdfunding, digital fundraising platforms, and social enterprise models, can reduce dependency on limited funding sources and improve operational resilience. The TOE framework further provides insight into how organizational readiness, environmental pressures, and technological capabilities influence adoption decisions.

Methodology and methods: this article is theoretical in nature and is based on a systematic literature review (SLR).

Main findings and contribution: The proposed framework contributes to both theory and practice by demonstrating that digital transformation, when integrated with alternative financing strategies, serves as a strategic enabler rather than merely a technical upgrade. It facilitates improved efficiency, transparency, and stakeholder engagement, while supporting the diversification of funding sources. Ultimately, this study highlights how NGOs can leverage these interconnected approaches to achieve more stable funding structures, enhanced operational performance, and greater long-term sustainability.

Originality and value: This research examines the combined role of digital transformation and alternative financing mechanisms in enhancing the stability and sustainability of NGOs.

Introduction

For the past couple of decades, the Middle East region has been largely relying on the traditional banking sector and the conventional ways to raise capital (Benyamina, 2024). On the other hand, the world and financial institutions are gradually relying more on digitalization (Llazo et al., 2024). This also applies to NGOs (non-governmental organizations) widely known as the “third sector” or” non-profit organizations” (NPOs) which specially in the Middle East region is until date relying mostly on traditional ways of raising capital. NGOs are still not yet adapted and aligned with the new trends and the rising financial ecosystem. Also, fintech is showing a slowing pace of acceptance in the humanitarian sector (Monich et al., 2023). However, NGOs need innovations as much as the other sectors of the economy to stay competitive and attractive to donors to be able to satisfy beneficiaries needs, since the NGO sector is a vulnerable one (Burde et al., 2017) as it is characterized by funding instability. The first weeks of the second Trump administration in 2025 are a proof that NGOs funding is unstable, as it has called the traditional role of US foreign aid fundamentally into question (Haug et al., 2025). This instability of funding is the root problem of NGOs. Cuts and delays in humanitarian aid have severe immediate effect on the lives of aid recipients and workers (Sterck et al., 2025).

Furthermore, NGOs are still not yet adapted and aligned with the new trends and face barriers and challenges when it comes to using technology. The Nonprofit Technology Impact Report (Sage,

2025) shows the slow growth in technology adoption among NGOs across the years, which is clearly slower than technology adoption across other sectors in the economy. Yoon (2024) found that NGOs face significant barriers to adopting digital marketing, particularly due to limited human resources and organizational constraints, which restrict their ability to fully utilize digital technologies for fundraising and stakeholder engagement. This slow progress certainly affects NGOs' performance and requires adjustments for better efficiency. All these developments are occurring in a global context where sustainability and digital transformation have become critical priorities, not only for businesses and governments but increasingly for NGOs as well.

This research examines the combined role of digital transformation and alternative financing mechanisms in enhancing the stability and sustainability of NGOs. Drawing on Resource Dependency Theory (RDT) and the Technology-Organization-Environment (TOE) framework, the study proposes a theoretical model that explains how technological adoption, when aligned with innovative financing approaches such as crowdfunding, digital fundraising platforms, and social enterprise models, can reduce dependency on limited funding sources and improve operational resilience.

Based on the above, this study addresses the fundamental research question:

How can non-profit organizations ensure more sustainability and organizational resilience? To comprehensively address this research question, two specific sub questions will be guiding this research:

- What is the role of digital transformation in the continuous existence/stability of NGOs?
- How can alternative financing complement the traditional and conventional ways of raising capital for NGOs?

The TOE framework further provides insight into how organizational readiness, environmental pressures, and technological capabilities influence adoption decisions. The proposed framework contributes to both theory and practice by demonstrating that digital transformation, when integrated with alternative financing strategies, serves as a strategic enabler rather than merely a technical upgrade. It facilitates improved efficiency, transparency, and stakeholder engagement, while supporting the diversification of funding sources. Ultimately, this study highlights how

NGOs can leverage these interconnected approaches to achieve more stable funding structures, enhanced operational performance, and greater long-term sustainability.

In the upcoming, we will start by introducing the contextual background by tackling digital transformation, alternative financing, and the sustainability of NGOs; the second section will tackle the theoretical background based on two main theories: The Resource Dependency Theory (RDT) and the Technology–Organization–Environment Theory (TOE)). Then we will discuss the theoretical development of this article in order to propose a conceptual model. The article concludes with its contributions, limitations and future suggested studies

Contextual Background

Systematic literature review (SLR)

A systematic literature review enables the identification, evaluation, and analysis of existing academic knowledge related to DT, alternative financing, and sustainability among NGOs. A systematic review approach is different than a narrative review as it follows a structured process that reduces selection bias and enhances the reliability of findings. The purpose of this methodology is to develop a conceptual framework explaining how digital transformation and alternative financing mechanisms can together improve and ideally achieve NGO sustainability and organizational resilience using the Resource Dependence Theory (RDT) and the Technology–Organization–Environment (TOE) frameworks. Major academic databases were used for this literature review (Scopus, Web of Science, Google Scholar, and ScienceDirect). The search process focused mainly on peer-reviewed journal articles, conference papers as well scholarly publications related to nonprofit organizations, digital transformation, financial technology, crowdfunding, peer-to-peer fundraising, sustainability, and organizational resilience.

Keywords used in the search process included combinations of the summarized terms below:

- “Digital transformation” AND “NGOs”
- “Nonprofit organizations” AND “alternative financing”
- “Crowdfunding” AND “nonprofit sustainability”
- “Fintech” AND “NGO fundraising”
- “Resource dependence theory” AND “nonprofit organizations”

- "TOE framework" AND "technology adoption"
- "Organizational resilience" AND "nonprofit sector"

The articles used were published between 2010 and 2026 to capture recent developments and updates in digital technologies and alternative financing mechanisms.

To ensure the relevance and quality of the reviewed literature, specific inclusion and exclusion criteria were applied and they are summarized in the table below:

Inclusion Criteria	Exclusion Criteria
Peer-reviewed academic publications	Non-academic reports and unpublished materials
Studies focusing on NGOs, NPOs, or the third sector	Studies not related to NGOs
Research addressing DT, fintech, crowdfunding, peer-to-peer fundraising, sustainability, or organizational resilience	Articles focusing exclusively on commercial or for-profit sectors without implications for NGOs
Studies using or discussing RDT or TOE frameworks	Duplicate studies across databases

Table 1: Inclusion and Exclusion criteria (by the authors)

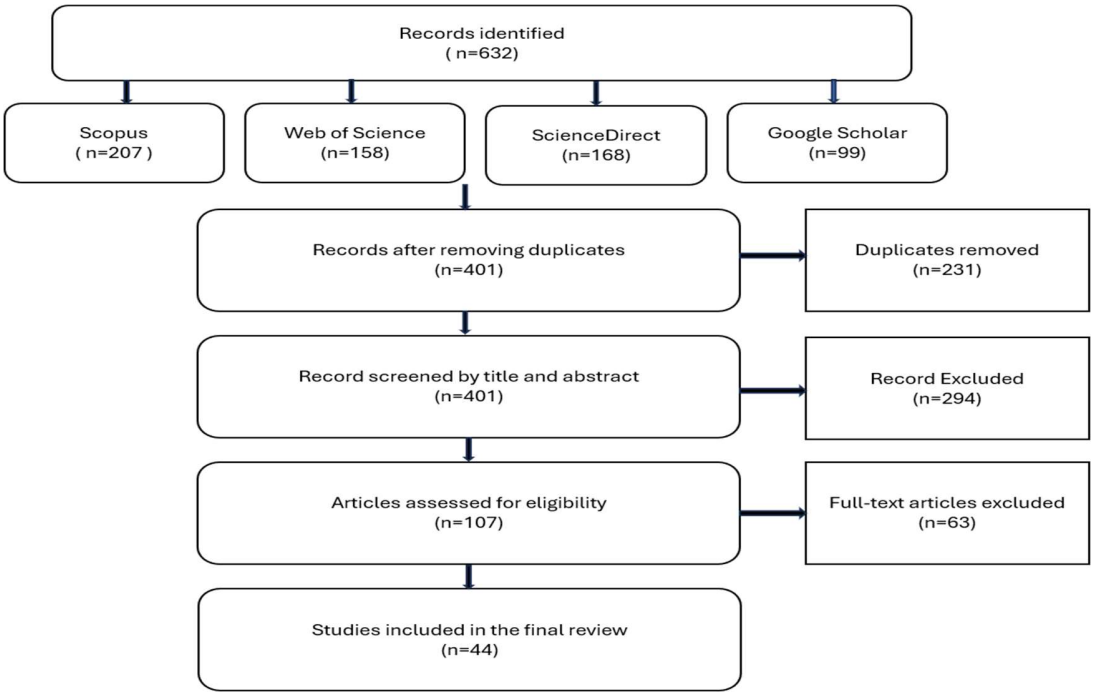


Figure 1: Systematic Literature search and selection process (by the authors)

Digital transformation

Digital transformation (DT) is reshaping financial services through technologies such as artificial intelligence (AI), data analytics, blockchain, and digital platforms. These technologies improve operational efficiency, enhance customer engagement, and enable new financial services and business models (Milian et al., 2019). FinTech firms increasingly integrate AI, machine learning, and digital platforms to transform traditional financial systems and drive innovation (Kou et al., 2023). DT is broadly defined as "organizational change that is triggered off and shaped by the widespread diffusion of digital technologies" (Hanelt et al., 2020, p. 1160).

In the nonprofit sector, digital transformation offers significant yet underutilized opportunities to strengthen organizational capacity and social impact (Halaweh et al., 2023). NGOs can improve efficiency by adopting technologies such as CRM systems, data analytics, AI, automation, mobile applications, websites, blockchain, and FinTech tools (Hanelt et al., 2020). Research shows that digital platforms enhance value creation (Holmlund et al., 2020), while organizational capabilities influence digital adoption and innovation (Siciliano et al., 2021). The effectiveness of data analytics depends on organizational readiness, and digital technologies also support fundraising through greater donor engagement on social media (Saxton et al., 2021) and improved organizational performance using AI (Raimo et al., 2024).

Alternative financing

Besides digital transformation, NGOs can improve efficiency and diversify funding through alternative finance. Allen and Qian (2025, p. 43) define alternative finance as "financing that operates within social, business, and virtual networks that generate informational, collateral, and incentive advantages compared to finance relying on traditional financial intermediaries." Key mechanisms include crowdfunding and peer-to-peer (P2P) fundraising.

Crowdfunding enables NGOs to mobilize resources and reach broader donor communities through digital platforms (Zhang et al., 2023). Its effectiveness is influenced by platform features, particularly narrative content (Huang et al., 2025), and can reduce dependence on traditional funding sources through financial technology (Abdallah & Younis, 2023). Abdallah and Younis (2023, p. 3) define crowdfunding as "a new idea" that allows nonprofits to use financial technology to reach larger audiences and connect people with shared values.

P2P fundraising is another alternative finance mechanism that connects individuals through digital platforms without traditional intermediaries (Zhang et al., 2023). In NGOs, it involves supporters raising donations through their personal networks rather than seeking financial returns. Hesse and Boenigk (2024/2025) show that individual fundraisers can increase donation outcomes by leveraging digital networks, while Castillo et al. (2014) demonstrate that social media sharing incentives can encourage donor engagement and generate additional contributions.

Sustainability and financial resilience

Sustainability is increasingly recognized as a key priority for organizations. Chedrawi et al. (2026) define sustainability as "ensuring the wellbeing for all that endures overtime." To maintain long-term organizational stability, organizations must integrate economic, social, and environmental goals to reduce disruptions, resource shortages, and uncertainty.

For NGOs, sustainability is particularly challenging because they depend on external funding rather than generating their own revenues. Their reliance on foreign aid and donor funding makes them vulnerable to funding interruptions that can threaten both organizational continuity and the communities they serve (Khieng & Dahles, 2015). Searing (2022) argues that financial resilience can be strengthened through revenue diversification, financial reserves, and effective financial management. Similarly, Bankufon (2026) highlights sustainable strategies to improve NGO stability in Cameroon, where growing humanitarian needs require stronger and more resilient nonprofit organizations. Although the study focuses on Cameroon, similar challenges exist in many countries where NGOs compensate for limited government capacity caused by corruption, resource constraints, or weak institutions. In such contexts, NGOs play a critical role in filling gaps in public service provision, although the availability of external aid remains uncertain (Deserranno & Qian, 2023).

Theoretical Background

This article uses the resource dependence theory (RDT) and the Technology–Organization–Environment (TOE) framework to explain how NGOs adopt digital tools and new financing models to become more resilient and sustainable and preserve their existence beyond relying on decreasing donor funding.

The Resource dependency theory (RDT)

How can the Resource dependency theory contribute to NGOs sustainability? The theory, originally developed by Pfeffer and Salancik (1978), argues that organizations are not fully autonomous or self-sufficient (Hillman et al., 2009). Organizations depend on several resources beyond their control. These resources are controlled by other actors around them such as suppliers, competitors, governments etc. For this reason, organizations need to maintain their relationships with those external actors to make sure their resources are secured and available. Jiang et al., (2023) also argues that the environment in which organizations and companies operate is complex and having access to resources is controlled by external factors. Recent research highlights the role of relationship governance mechanisms in reducing the negative effects of dependence. For example, Shi et al., (2024) concludes that organizations with strong relationship commitment to third-party logistics providers experienced improved operational performance, as commitment helped mitigate risks associated with resource dependence. Their study also showed that contextual factors, such as communication quality, length of the supplier relationship, and firm size, influenced the effectiveness of these. These findings extend RDT by demonstrating how firms can actively manage dependence in dynamic, highly interdependent supply chain environments for instance.

In our context, NGOs rely heavily on external resources such as donor funding, technical expertise, and legitimacy, making them highly dependent on their environment (Hillman et al., 2009). Resource Dependence Theory (RDT) suggests that this dependence shapes organizational strategies, as NGOs must carefully manage relationships with different stakeholders among which donors, partner organizations, and governments to secure critical resources (Jiang et al., 2023). Research shows that diversifying funding sources, building strategic partnerships, and strengthening organizational legitimacy are key strategies for reducing uncertainty and maintaining autonomy (Shi et al., 2024). By applying RDT in the NGO context, scholars highlight the trade-offs between dependence and organizational flexibility, emphasizing how NGOs navigate external pressures while pursuing their mission.

Technology–organization–environment (TOE) theory

The Technology–Organization–Environment (TOE) framework explains that organizational adoption of technological innovations is influenced by technological, organizational, and

environmental contexts (Baker, 2012). Tornatzky and Fleischer (1990) talk about the development of innovations and their adoption by firms and organizations. The TOE framework represents one segment of the process described in the book which is how the development and implementation of innovations is influenced by the context of the firm (Baker, 2012), more specifically, the TOE contexts. A recent study by Wang and Zhang, 2025, demonstrates that sustainability outcomes depend on the interaction between technology (FinTech), organizational processes (supply chain finance), and environmental conditions (digital infrastructure and institutional environment). The authors analyze data from Chinese companies between 2012 and 2022 to understand how technological innovation, organizational processes, and environmental factors interact all together to achieve sustainability. They found out that fintech increases efficiency and reduces information asymmetry which positively affects sustainability, organizational mechanisms play a mediating role, and environmental factors strengthen the effect.

The TOE framework explains how organizations adopt innovations based on technological availability, internal organizational capabilities, and external environmental pressures. How can this model benefit the non-profit sector and contribute to its sustainability? In the context of NGOs, technological factors such as digital platforms, organizational factors such as leadership and human resources, and environmental factors such as donor expectations and regulatory requirements influence the adoption of innovations that enhance organizational sustainability and effectiveness (Sila, 2013). Studies on nonprofit organizations indicate that technological availability, organizational capabilities, and environmental factors influence technology adoption within the NGOs sector (Godefroid et al., 2023).

Theoretical Development and Discussion

Recent research shows that digital transformation (DT) is reshaping how NGOs operate, communicate, and deliver services. Digital tools such as online communication platforms, collaboration systems, and remote service delivery mechanisms allow NGOs to maintain operations and stakeholder engagement during crises, including the COVID-19 pandemic and periods of funding uncertainty (Adhikari et al., 2023). The adoption of service platforms, online programs, and digital reporting systems also improves accountability and accessibility for beneficiaries (Cordery et al., 2023). Furthermore, data analytics, cloud-based systems, and digital reporting tools enhance governance, performance measurement, and transparency (Cordery et al.,

2023). Beyond internal processes, websites, social media, and online networking platforms help NGOs strengthen stakeholder relationships, mobilize resources, and expand advocacy efforts (Lovejoy & Saxton, 2012; Guo & Saxton, 2014).

Digital transformation also enables NGOs to adopt alternative financing strategies by supporting online donations, crowdfunding, digital payment systems, and social media fundraising campaigns, allowing organizations to reach broader donor communities and diversify funding sources (Guo & Saxton, 2014; Lovejoy & Saxton, 2012). Digital platforms further facilitate peer-to-peer fundraising, subscription-based giving, and micro-donations, while CRM systems and data analytics help NGOs identify donors, monitor engagement, and develop targeted fundraising strategies (Cordery et al., 2023). Consequently, DT contributes not only to operational efficiency and service delivery but also to financial resilience and long-term sustainability.

These opportunities align with the Resource Dependence Theory (RDT) and Technology–Organization–Environment (TOE) framework. RDT suggests that organizations adopt strategies to reduce dependence on scarce and uncertain resources, such as government funding and traditional grants (Pfeffer & Salancik, 1978). Through digital fundraising tools, NGOs can diversify revenues, access new donor groups, and reduce reliance on limited funding sources (Guo & Saxton, 2014; Lovejoy & Saxton, 2012). The TOE framework further explains DT adoption through technological factors (availability and suitability of digital tools), organizational factors (resources, capabilities, and digital skills), and environmental pressures (stakeholder expectations and external demands) (Cordery et al., 2023; Sarker et al., 2023). Therefore, digital transformation supports NGO sustainability by improving operations, strengthening stakeholder engagement, and enabling innovative fundraising approaches.

The following table summarizes our findings, and shows the relationship between digital technologies, alternative financing methods and the theories suggested in our study:

Digital Technologies / Tools	Alternative Financing Methods Enabled Transparency & Accountability	Theoretical Link (RDT / TOE)
Online donation platforms	Direct online donations from individual donors	RDT: Reduces dependence on traditional grants; TOE: Technological availability & organizational capability enable adoption
Crowdfunding websites	Project-based crowdfunding and micro-donations	RDT: Diversifies revenue streams, managing external resource uncertainty;

		TOE: Environmental pressures (donor expectations) drive adoption
Social media platforms	Peer-to-peer fundraising, social media campaigns	RDT: Engages wider donor base to reduce dependence; TOE: Technology & environmental context facilitate outreach
Digital CRM & data analytics	Targeted fundraising, donor segmentation, subscription-based giving	RDT: Helps manage critical resources; TOE: Organizational capabilities enable strategic donor management
Digital collaboration & service platforms	Indirect support for fundraising by improving transparency and accountability	RDT Enhances legitimacy to secure funding; TOE: Organizational & environmental factors motivate adoption for stakeholder trust

Table 2: the relationship between digital technologies, alternative financing methods and the theories suggested (by the authors)

Based on the above literature review, the following theoretical framework (figure 1) is proposed as a roadmap towards integrating digital transformation and alternative financing in NGO for a more sustainable future drawing on both TOE and RDT perspectives:

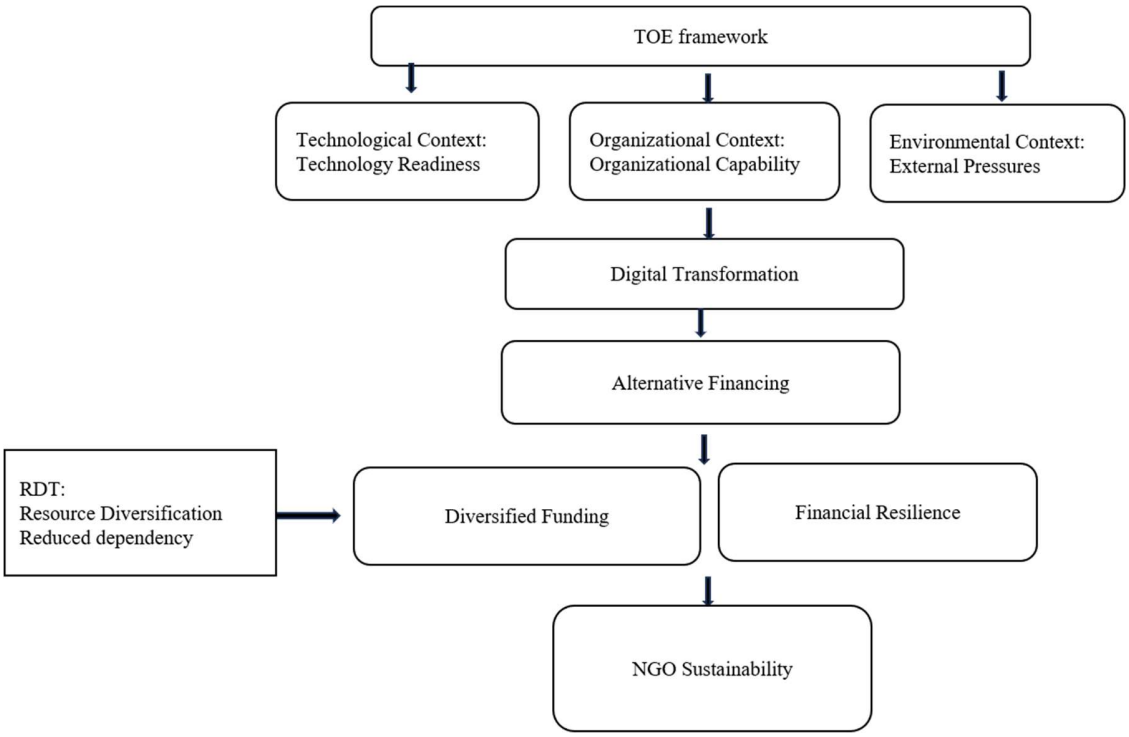


Figure 2: The Proposed theoretical framework (by the authors)

Contributions, Conclusion, Limitation and Future Studies

Contributions and conclusion

The findings of this study contribute to the nonprofit sector by identifying strategies that enhance organizational sustainability and reduce vulnerability to external shocks. Theoretically, this study demonstrates how RDT and TOE explain digital transformation (DT) adoption in NGOs by showing how resource dependencies interact with technological, organizational, and environmental factors to influence digital adoption and outcomes such as efficiency, stakeholder engagement, and financial sustainability.

Practically, NGOs operating under unstable funding conditions, changing donor priorities, and limited government support can use digital technologies to strengthen resilience and improve long-term sustainability. Tools such as social media, websites, AI, fintech, blockchain, CRM systems, and digital management platforms enable NGOs to improve communication, increase transparency, engage donors, optimize fundraising, and diversify funding sources. AI and data analytics support donor segmentation and campaign strategies, fintech enables secure transactions, blockchain enhances accountability, and CRM systems strengthen donor relationships.

However, successful digital transformation requires more than technological availability. NGOs need adequate resources, digital skills, innovation-oriented cultures, leadership support, and staff training to effectively integrate digital tools. Financial capacity is also important, as initial investments in software, infrastructure, and training may be significant despite potential long-term benefits.

The external environment also shapes DT success. Donor expectations, regulations, technological infrastructure, internet access, and digital payment systems can either facilitate or restrict adoption. When technological, organizational, and environmental conditions are aligned, NGOs are better positioned to implement digital transformation and adopt alternative financing mechanisms such as crowdfunding, peer-to-peer fundraising, and digital donations.

By diversifying funding sources through digital technologies, NGOs can reduce dependence on external resource providers, consistent with Resource Dependence Theory, and strengthen financial autonomy and resilience. Therefore, NGOs should adopt a holistic DT approach that

combines technological adoption with internal capacity building, leadership commitment, sufficient resources, and supportive external conditions.

Limitation and future studies

Despite its contributions, this study has limitations. The research is theoretical and does not include empirical investigation. While theoretical studies provide valuable frameworks and conceptual understanding, they may lack direct validation of real-world outcomes and may not fully capture differences related to organizational size, resources, culture, and regional contexts. Therefore, future research should empirically test the proposed model using quantitative and qualitative methods to validate the relationships between digital transformation, alternative financing, organizational sustainability, and the factors identified through RDT and TOE.

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CAN GENAI TRIGGER AMBIDEXTERITY IN LIFE SCIENCE BUSINESSES? THE ROLE OF ABSORPTIVE CAPACITY IN KNOWLEDGE LEGITIMATION

Rialti, Riccardo* Zanni, Lorenzo*

*Department of Business and Corporate Law, University of Siena, Siena, Italy

Keywords: Generative Artificial Intelligence; Algorithmic Bias; Absorptive Capacity; Knowledge Integration; Organizational Ambidexterity; Life Science

Abstract

Businesses operating in the life sciences (LS) industry increasingly rely on artificial intelligence (AI). Early applications primarily involved analytic AI for structured data analysis and diagnostic decision-making, and predictive AI for drug discovery and clinical trial optimisation (Apell and Eriksson, 2023). A major turning point has been the diffusion of generative AI (GenAI), which can generate new insights, simulations, and knowledge representations through the reinterpretation of historical datasets, the simulation of biological or clinical scenarios, and advanced reasoning capabilities (Viswa et al., 2024). While these features offer opportunities to accelerate research and enhance decision-making, they also introduce new epistemic and organisational challenges related to the interpretability, reliability, and governance of algorithmic insights.

Prior research on GenAI adoption in LS has focused on adoption drivers, organisational resistance to change, and performance implications. Less attention has been paid to how organizations transform algorithmically generated information into knowledge that supports operational and strategic decision-making. This gap is particularly relevant in LS, which is characterised by high scientific complexity, strong reliance on empirical evidence, and strict regulatory requirements. Information from GenAI therefore cannot be accepted uncritically; it must be interpreted, analytically evaluated, and validated before integration into organisational practices. Against this backdrop, this study investigates how LS businesses transform

information from GenAI into legitimized knowledge and examines the potential organisational benefits that may emerge.

To explore these dynamics, the study adopts an inductive qualitative design based on four comparative case studies within the LS industry. Following principles of engaged scholarship, the research examines how organizations interpret, legitimize, exploit, and integrate information generated by GenAI. Data were collected through 20 semi-structured interviews with managers and experts, complemented by internal documentation and observations of organisational practices. Data analysis followed an iterative qualitative coding process combining within-case analysis and cross-case comparison, enabling the identification of recurring mechanisms and sequential processes through which GenAI information is interpreted, legitimized, and incorporated into organisational knowledge repositories (Kumar et al., 2025).

The theoretical interpretation of the findings draws on three streams of literature: technological affordances, absorptive capacity, and organisational ambidexterity. From the affordance perspective, organizations initially perceive AI as a technological catalyst characterised by a bundle of perceived opportunities and biases (Kopka and Grashof, 2022). Key affordances include the ability to identify previously unobserved patterns, generate simulations, reinterpret historical datasets, and its apparent ease of use. Conversely, concerns about algorithmic opacity, limited data representativeness, and regulatory accountability introduce biases that shape managerial evaluations. These perceptions trigger managerial attention and stimulate organisational actions aimed at assessing GenAI's potential and limitations.

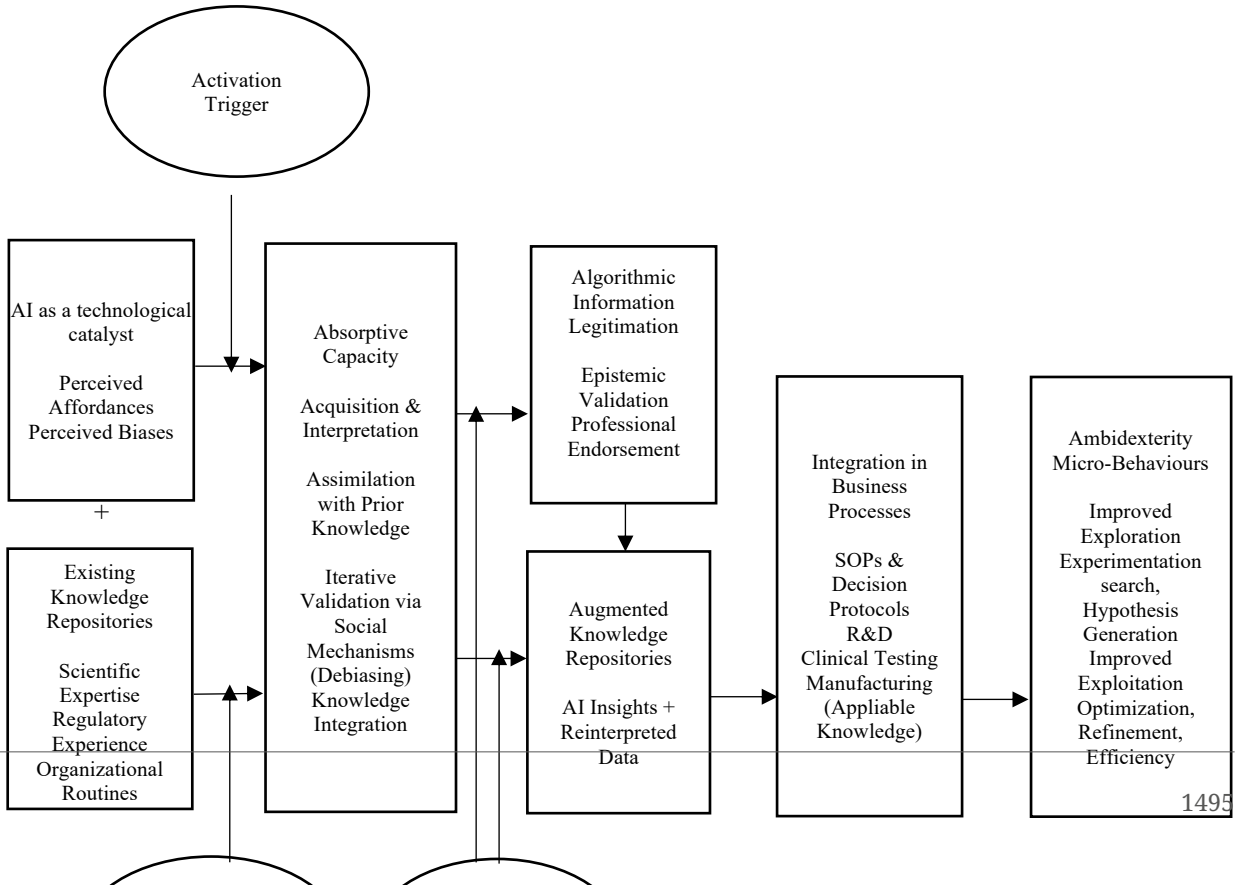
Absorptive capacity emerges as the central mechanism through which organizations acquire, interpret, and legitimize information from GenAI. Rather than being directly incorporated into decision-making, algorithmic outputs first undergo interpretation and critical evaluation by comparison with existing scientific knowledge, empirical evidence, and prior experience. In this phase, GenAI insights are treated as provisional analytical signals requiring validation (Kim et al., 2026). Social integration mechanisms play a key role in this process. Researchers, clinicians, data scientists, and managers engage in iterative discussions to interpret algorithmic outputs, assess plausibility, and identify potential biases or inconsistencies. Through cross-functional dialogue, organizations collectively interpret emerging information and compare it with external scientific evidence. As GenAI insights undergo repeated cycles of interpretation and validation, some outputs acquire epistemic legitimacy, particularly when supported by empirical confirmation or alignment with established knowledge. Once legitimized, these

insights are integrated into existing knowledge repositories through processes of recombination with prior knowledge structures (Robertson et al., 2024).

Over time, legitimized information from GenAI reshapes organisational knowledge by enabling the detection of previously overlooked patterns and relationships. Organisational routines and decision-making processes become increasingly influenced by enhanced analytical hindsight and automation (Rogge et al., 2025). The cases reveal increased experimentation, broader search activities, and enhanced hypothesis generation, alongside improvements in optimisation, process refinement, and operational efficiency. These knowledge-related effects foster behavioural patterns that can be interpreted as micro-level manifestations of organisational ambidexterity, supporting the simultaneous strengthening of exploratory and exploitative activities (see fig. 1).

In this vein, this study extends absorptive capacity theory by showing that it involves assimilating, interpreting to debias, and legitimizing AI-generated information. It also proposes a processual perspective on AI adoption in life sciences, highlighting how value emerges from interactions between organisational capabilities, validation practices, and institutional constraints that transform algorithmic outputs into reliable and actionable knowledge (Yavetz and Nakash, 2026).

Fig. 1. Process Framework Describing How Absorptive Capacity Fosters Algorithmic Knowledge Legitimation and Ambidexterity Micro-Behaviours



Source: Authors' Elaboration

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WITHERED? OR WONDERFUL? – THE EFFECT OF HUMAN VERSUS VIRTUAL ELDERLY FEMALE INFLUENCERS ON CONSUMER PERCEPTIONS AND ADVERTISING EFFECTIVENESS

Prastiti, Aigli[1]; Voutsa, Maria C.[1]; Melanthiou, Yioula[1]; Boutsouki, Christina[2]

[1]Department of Communication and Marketing, Cyprus University of Technology, Limassol, Cyprus

[2]School of Economics, Aristotle University of Thessaloniki, Thessaloniki, Greece

Keywords: Granfluencers, Virtual Influencers, Source Credibility Theory, Uncanny Valley Theory, Elderly Representation, Advertising Effectiveness, Cognitive Age, Beauty Industry

Introduction

In the digital era, social media influencers significantly impact consumer behaviour. While internet usage was once youth-centric, older adults are now active participants, fostering the rise of 'granfluencers' (i.e., elderly influencers) who engage audiences effectively (Wang & Taylor, 2025). However, elderly representation in advertising remains limited and stereotypical, particularly in the beauty industry where youth stereotypes prevail (Eisend, 2022). Although some campaigns challenge ageism, older women remain underrepresented compared to younger models (Berg & Liljedal, 2023). Concurrently, Virtual Influencers (VIs) have emerged as powerful marketing tools. While literature exists on elderly representation, influencers, and VIs separately, research comparing human granfluencers (HGI) against virtual granfluencers (VGI) is scarce.

Purpose, Aim and Objectives

This study investigates the effect of HGI versus VGI on female consumers' perceptions, advertising effectiveness, and attitudes toward the elderly. The aim is to determine whether VGI can match HGI effectiveness in beauty campaigns without triggering negative psychological responses. Guided by Source Credibility and Uncanny Valley theories, objectives include: (1) examining differences in uncanniness, trustworthiness, attractiveness, and expertise; (2) assessing ad attitude and purchase intention; (3) evaluating changes in attitudes toward the elderly; and (4) analysing the moderating role of chronological and cognitive age.

Literature Review and Theoretical Framework

Existing literature extensively examines elderly representation (Eisend, 2022), influencers, and VIs independently, yet research combining these domains is scarce. While 'granfluencers' challenge age stereotypes (Wang & Taylor, 2025), elderly women remain underrepresented in beauty advertising. Conversely, VIs offer engagement but risk negative psychological responses. This study integrates Source Credibility Theory (Ohanian, 1990) and Uncanny Valley Theory (Mori, 1970) to address this gap. Source Credibility Theory posits that expertise, trustworthiness, and attractiveness determine message acceptance, providing a framework to compare HGI and VGI. Uncanny Valley Theory explains the potential discomfort caused by hyper-realistic VIs, which may undermine credibility and ad effectiveness, shaping attitude toward the elderly as well.

Methodology and Methods

A quantitative, between-subjects experimental design (2x1: VGI vs. HGI) was employed. The stimuli consisted of an Instagram Get-Ready-With-Me (GRWM) video advertisement for an anti-aging cream, featuring either a real HGI or a VGI designed to visually match the HGI. The final valid sample comprised 182 female consumers aged 18 and older (M=33.90, SD=13.50) from Cyprus and Greece. Data were collected through a self-reported questionnaire measuring uncanniness, source credibility, ad attitude, brand attitude, and attitudes toward the elderly. Chronological and cognitive

ages were examined as moderators. Data analysis included Independent Sample T-tests and the Process macro.

Findings and Contribution

The findings revealed that the VGI triggered significantly greater uncanniness and was perceived as less trustworthy and less expert than the HGI, though no significant differences were found in attractiveness. Consequently, the HGI elicited a more positive ad attitude, while brand attitude and attitudes toward the elderly remained unaffected. Crucially, chronological and cognitive ages significantly moderated these perceptions. Younger women and those with a lower cognitive age evaluated the VGI more negatively, reporting higher uncanniness and lower credibility. Conversely, for women with a higher cognitive age, the differences between the HGI and VGI diminished, indicating that a higher cognitive age mitigates the uncanny valley effect and bridges the credibility gap.

Research Limitations

The study uses a convenience sample with geographic specificity (Cyprus and Greece) and focuses on a single stereotypical product category (anti-aging cream). The cross-sectional design limits causal inferences over time. Additionally, the study focuses solely on female consumers, which restricts generalisability to male audiences.

Theoretical and Practical Applications and Implications

Theoretically, this study elucidates virtual anthropomorphism within aging contexts, extending Uncanny Valley theory to marketing communications. Notably, it addresses a critical gap in elderly representation literature (Eisend, 2022) by empirically examining changes in attitudes toward the elderly. Managerially, findings will inform brand strategies on leveraging human versus virtual granfluencers to mitigate ageism while optimising campaign effectiveness. Ultimately, these insights advocate for diverse media representation, fostering positive societal shifts regarding aging.

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REVISITING BRAND AUTHENTICITY: RESEARCH LANDSCAPE ANALYSIS

Aleidan, Ali; Loureiro, Sandra Maria Correia; Rosado-Pinto, Filipa

Instituto Universitário de Lisboa (ISCTE-IUL), Business Research Unit (BRU-IUL), Lisbon, Portugal

Keywords: Marketing, Brand authenticity, Bibliometric analysis, Systematic literature review.

In the 21st century, customers increasingly demand authentic signaling tools that go beyond conventional marketing approaches, while preserving both brand credibility and integrity of the authenticity concept itself (Beverland, 2006; Morhart *et al.*, 2015). Although reflecting the growing scholarly interest in this topic, literature remains fragmented across multiple domains. This study contributes to the literature by systematically mapping the field, revealing key thematic developments, and advancing understanding of the evolving landscape of brand authenticity research. This study aims to provide a systematic and bibliometric analysis of brand authenticity to answer the research question: "What has been published about brand authenticity in the past five years, particularly regarding the factors that clarify the role of authenticity in the context of brands?"

The Scopus database was used to collect relevant literature for this study by searching the keywords "BRAND" and "AUTHENTIC*" and limiting results to publications from 2020 to 2024. The decision to focus on the last five years is driven by the rapid evolution of AI and digital technologies, which are fundamentally reshaping the concept of brand authenticity. The search, conducted on November 27, 2024, initially identified 737 documents. These records were screened based on titles, abstracts, and keywords, followed by full-text review, resulting in 132 studies included in the final sample. Publication selection followed specific inclusion and exclusion criteria, with each article evaluated for relevance and rigor across constructs, theoretical robustness, methodological processes, and research contributions, in line with recognized standards in the literature (Macpherson and Holt, 2007).

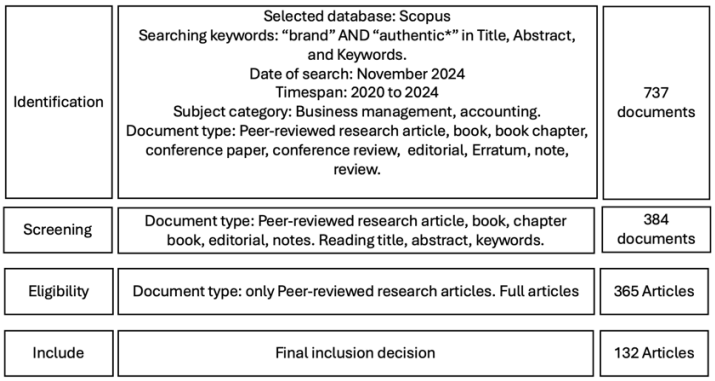


Figure 1. A process of data collection and analysis.

Source: author's elaboration.

This study examines co-citation analysis and identifies four thematic trends: brand relationship, brand value, human brand authenticity, and brand activism. The co-citation analysis reveals foundational scholarly interest in linking brand authenticity with brand complexity, evolving cultural and societal norms (Holt, 2002), emotional dimensions of brand value (Carroll and Ahuvia, 2006; Batra, Ahuvia and Bagozzi, 2012), policies that reflect brand competencies and integrity through brand activism (Bhagwat *et al.*, 2020; Vredenburg *et al.*, 2020), and consumer needs for ambitious and inspiring perceptions of human brand authenticity (Moulard, Garrity and Rice, 2015).

In addition, the co-word analysis identifies four clusters, highlighting how brand equity facilitates affective bonds and consumer intentions through brand image and storytelling (Jun and Yi, 2020; Oliveira and Fernandes, 2022). The articulation and consistency of message and tone maintain positive attitudes and an authentic stance in brand love and CSR (Moorman, 2020), while digital marketing tools enhance engagement, interaction, and persuasive influence (Eigenraam, Eelen and Verlegh, 2021). Furthermore, integrating sustainability and blockchain technology into core business practices promotes transparency and fosters trustworthy marketplaces (Oguntegbe, Di Paola and Vona, 2021; Wallach and Popovich, 2023).

This systematic and bibliometric analysis of brand authenticity consolidates fragmented research streams and clarifies how brand authenticity operates across brand relationships, brand value, brand activism, and human brand authenticity. The starting mechanism of brand love is contingent on the utilitarian and hedonic value derived from customer consumption, which in turn shapes brand relationships more broadly. Brand equity serves as a strategic resource that

mitigates backlash and enhances the effectiveness of activism initiatives, values and identity. Brand activism requires navigating controversial discourse with clear moral purpose and competence, while transparency and value alignment prevent perceptions of opportunism and inauthenticity. Therefore, managers should recognize the strategic importance of brand authenticity and apply the key insights identified in this study to inform organizational policies and practices.

The study reveals multiple gaps and directions for future research concerning social media communication, human-like agents, lifestyle patterns of Generation Z, AI-driven dynamics, and others. And, mainly over the past five years, three dominant research themes have clearly emerged: sustainability, digital marketing and social media, and brand activism.

Our study can not be without limitations. During data collection, human error may have occurred, potentially resulting in the loss or omission of some files during extraction into VOSviewer and RStudio. Besides, a degree of subjectivity in the selection of relevant studies may have introduced potential human bias.

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ENTERING THE FLOW: HOW INFLUENCER EMBEDDEDNESS SHAPES ADVERTISING EFFECTIVENESS IN THE METAVERSE

Yildiz, Duygu[1]; Loureiro, Sandra[2]; Guerreiro, João[3]

[1]Business Research Unit, University Institute of Lisbon, Lisbon, Portugal

[2]Business Research Unit, University Institute of Lisbon, Lisbon, Portugal

[3]Business Research Unit, University Institute of Lisbon, Lisbon, Portugal

Keywords: Metaverse, Virtual Influencers, Influencer Embeddedness, Flow, Advertising Effectiveness

Metaverse is transforming consumer engagement with brands by enabling immersive activities, social interaction, and virtual community membership that foster experiential consumption (Rungruangjit et al., 2026). Within this environment, virtual influencers emerge as active participants performing tasks in consumer activities (Sorosrungruang et al., 2024; Hou et al., 2026). Given that, virtual influencer participation may shape user engagement and experiential states such as flow.

Flow is characterized by absolute concentration and enjoyment (Moneta & Csikszentmihalyi, 1996) and enhances advertising effectiveness in the metaverse (Kumar et al., 2025). Research calls for greater understanding of which metaverse features, including design aspects and user interaction mechanisms, are most critical for generating flow experiences (Flavián and Barta, 2022). Responding to this call, this study introduces the concept of influencer embeddedness and examines how virtual influencer participation, as an interaction design element, shapes flow and consumer responses.

We define influencer embeddedness as the extent to which an influencer becomes functionally integrated into a user activity and operationalize it through virtual influencer participation. We distinguish it between activity-relevant participation, supporting user activity and increasing flow versus activity-irrelevant participation, disrupting the activity and interfering with the flow. Building on this conceptualization, and drawing on the Flow Theory

(Csikszentmihalyi,1990) and the Stimulus-Organism-Response (S-O-R) framework (Mehrabian and Russell, 1974), we propose (see Figure 1):

H1: Activity-relevant (vs. activity-irrelevant) virtual influencer participation leads to higher levels of flow.
H2: Flow positively influences advertising effectiveness (e.g., ad recall).
H3: Flow mediates the relationship between activity-relevant (vs. activity-irrelevant) virtual influencer participation and advertising effectiveness.

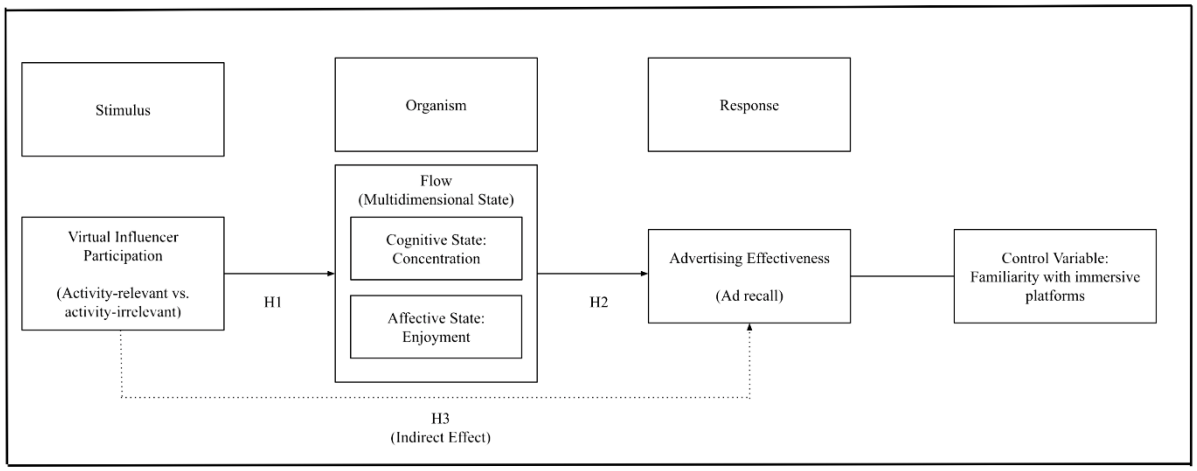


Figure 1: Proposed Conceptual Model (Embedded Influencer Model)

To test these hypotheses, the study employs a single-factor experimental design in a simulated metaverse environment (e.g. Zepeto or similar), following prior metaverse advertising research (Kim and Lee, 2024). Participants (N ≈ 250–320) recruited through online research panels (e.g., Qualtrics, Prolific) are randomly assigned to conditions, manipulating activity-relevant versus activity-irrelevant virtual influencer participation. Flow is measured according to prior research on flow in interactive environments (Barhorst et al., 2021). Advertising effectiveness is operationalized as unaided ad recall, and familiarity with immersive platforms is included as a control variable to account for individual differences in prior experience in line with Kim and Lee (2024).

This study aims to contribute to literature by introducing influencer embeddedness as a new construct capturing the functional integration of virtual influencers into user activities and advancing the S-O-R framework by positioning flow as the central mechanism linking virtual

influencer participation to consumer responses. Managerially, the study proposes that firms should embed influencers into and ensure their participation remains relevant to user activities. A limitation of the study could be the use of a simulated environment, which may not fully capture the complexity of real-world platforms.

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REFRAMING NATION BRANDING IN THE DIGITAL ERA: AI-DRIVEN COUNTRY IMAGE AND SOFT POWER

Czarczyńska, Anna

Faculty of Economics and Business, University of A Coruña, A Coruña, Spain and Faculty of Economics, Kozminski University, Warsaw, Poland

Keywords: Artificial Intelligence, Economic Growth, National Competitiveness, Soft Power, International Relations, Technology Diplomacy, Economic Development

Background

In a globalised, technology-dependent economy, artificial intelligence (AI) has become a key factor shaping countries' economic competitiveness and international standing (Gonzales, 2023; Wang and He, 2024). Countries increasingly treat AI capability as a strategic asset that strengthens economic growth and soft power (Vijayakumar, 2022; Feijóo and Kwon, 2020). National AI strategies and digital platform strength increasingly shape national branding, investment decisions and geopolitical positioning (Zhang, 2024).

Objective

This study examines the economic and soft power dimensions of AI development, and how national AI innovation shapes GDP growth, competitiveness and country image. It addresses three questions: (1) how AI innovation accelerates economic performance; (2) how national AI capability functions as an instrument of soft power; and (3) how institutional quality mediates the AI-growth relationship.

Methods

This study synthesises findings from 14 peer-reviewed articles published between 2020 and 2025, including econometric panel data analyses, cross-sectional studies, qualitative policy analysis, and case studies on AI strategy in China, the US, Russia and East Asia.

Results

Empirical evidence points to a strong, positive relationship between AI innovation and economic growth. AI-related patents significantly boost long-term growth, particularly in

developed economies (Gonzales, 2023). In European countries, AI development supports growth by 0.217 per cent, with positive shocks adding a further 0.026 per cent (Kalai and Becha, 2024). East Asian economies show similar patterns, with AI a significant driver of GDP growth between 2010 and 2023 (Abid, 2025). AI's growth effect is strongest for middle-income countries, while high-income economies show more complex effects (Wang and He, 2024), and countries with advanced AI capability show higher GDP levels and a stronger global economic position (Zhang, 2024), though AI can also exacerbate inequality (Adigwe and Olaniyi, 2024). Beyond economic effects, AI is a powerful soft power tool - China uses AI platforms and digital diplomacy to shape global narratives and strengthen its innovative image (Valle and Wang, 2025; Vijayakumar, 2022). National AI strategies function as branding tools signalling technological standing and investment potential (Bógdał-Brzezińska, 2023; Feijóo and Kwon, 2020). Public attitudes and institutional adaptation vary internationally, with emerging economies more optimistic and high-income Western democracies more sceptical (Wang, 2025), a pattern that may constrain long-term growth prospects.

Conclusions

AI capability has become a fundamental pillar of national economic strategy, shaping GDP growth, competitiveness and soft power projection. AI innovation generates measurable economic benefits, particularly in developed and middle-income economies, while increasingly functioning as a mechanism shaping international relations. These benefits depend on institutional quality, public trust and strategic communication. Countries seeking to maximise AI's economic potential should combine technological investment with confidence-building measures, ethical governance and long-term narrative management.

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AI EMPATHY AND HUMAN-AI INTERACTION: EFFECTS ON ENGAGEMENT AND WELLBEING IN HEALTHCARE SERVICES

Abdulla, Lana[1]; Foroudi, Pantea[2]; Zha, Dongmei[3]

[1]Brunel Business School, Brunel University of London, London, UK

[2]Brunel Business School, Brunel University of London, London, UK

[3]Brunel Business School, Brunel University of London, London, UK

Keywords: AI Empathy, Responsible AI, Human-AI Interaction, User Engagement, User Wellbeing, Stress, Technology Readiness

Introduction

Artificial Intelligence (AI) is transforming healthcare by reshaping decision making, service delivery, and patient experiences, enabling more responsive and personalised human-digital interactions (Moorman et al., 2024). Within this transformation, AI empathy has emerged as a key research focus due to its potential to enhance engagement while raising ethical concerns (Huang and Rust, 2024; Liu Thompkins et al., 2022).

However, significant theoretical gaps remain. Research lacks sufficient conceptual development of advanced emotional AI capabilities beyond functional performance (Hollebeek et al., 2024; Liu Thompkins et al., 2022), remains fragmented across AI empathy, responsible AI, and AI consciousness, limiting integrative understanding of their joint influence on human-AI interaction and engagement (Hollebeek et al., 2024), and faces limited measurement development for emerging constructs such as AI consciousness (Chi et al., 2025).

This study examines how AI empathy, together with AI consciousness and responsible AI, shapes human-AI interaction and influences user engagement and wellbeing. It addresses three research questions: (i) How do AI consciousness, AI empathy, and responsible AI influence human-AI interaction quality? (ii) To what extent does human-AI interaction shape user engagement and wellbeing? (iii) How do technology readiness and user stress condition relationships between AI capabilities and engagement outcomes?

The Conceptual framework

This study introduces a conceptual framework capturing key psychological and ethical dimensions of AI empathy. AI empathy is conceptualised as AI's ability to detect users' emotional states, interpret cognitive needs, and respond through emotionally intelligent behaviours facilitating two-way interaction (Huang and Rust, 2024; Liu Thompkins et al., 2022). The framework integrates three antecedents: AI consciousness, AI empathy, and responsible AI. AI consciousness supports context-sensitive responses (Esmaeilzadeh and Vaezi, 2022), while responsible AI ensures transparency, accountability, and ethical deployment.

These antecedents influence human-AI interaction, reflected through social presence, intelligence, and social interactivity (Liu Thompkins et al., 2022). The interaction shapes cognitive, affective, and behavioural engagement, which influences wellbeing (Hollebeek et al., 2024). The framework further incorporates moderating conditions, where technology readiness shapes responses to AI capabilities, and user stress, including psychological, information, and outcome stress, conditions engagement outcomes.

Methodology

The study adopts a sequential mixed-methods approach (Creswell, 2003). In Phase 1, 37 in-depth semi-structured interviews will be conducted with healthcare professionals and AI developers to explore key themes related to emotional intelligence, trust, and ethical AI. This phase provides qualitative insight into the antecedents of empathy and the nuances of emotionally intelligent service delivery. Phase 2 introduces a controlled 2x2 between-subjects experimental design, manipulating two factors: AI empathy (high vs. low) and service context (high-stress vs. low-stress healthcare scenario). Participants' perceptions of interaction quality, emotional engagement, and trust will be measured to examine the causal effects of AI empathy under emotional strain. Phase 3 consists of a quantitative survey with 500-600 healthcare users and professionals in the UK.

Contribution

This study advances the literature by positioning AI empathy as a core capability and introducing AI consciousness as a foundational construct shaping emotionally and ethically grounded human-AI interaction and wellbeing outcomes. Theoretically, it proposes an

integrative framework combining AI consciousness, responsible AI, and AI empathy to explain their joint influence on human-AI interaction and engagement, addressing fragmentation and limited conceptual development in existing research. It also supports developing measurement instruments for AI consciousness. Practically, the findings provide guidance for healthcare providers and service designers by demonstrating how emotionally intelligent and ethically grounded AI systems can enhance user engagement and wellbeing in healthcare contexts.

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THE EL GHANDOUR IDENTITY THEOREM: A UNIVERSAL COHERENCE METRIC FOR AI-DRIVEN MANAGEMENT SYSTEMS

Elghandour, Feras[1]; Balomenou, Chrysanthi[2]; Huqi, Melisa[3]

[1]El Ghandour Research Labs, Ontario, Canada

[2]Faculty of Economics and Administrative Sciences, Epoka University, Tirana, Albania

[3]El Ghandour Research Labs, Ontario, Canada

Keywords: AI Reliability, Coherence Metric, Golden Ratio, Signal-to-Noise Ratio, Byzantine Fault Tolerance, Formal Verification

Abstract

The deployment of artificial intelligence in enterprise management has created an urgent need for universal, mathematically grounded reliability metrics. Current frameworks rely on task-specific benchmarks that lack a unifying theoretical foundation, leaving managers without an objective criterion for when AI is reliable enough to act upon. This paper asks: can a single, mathematically derived threshold separate reliable from unreliable AI operation across management domains? We answer affirmatively by introducing the El Ghandour Identity Theorem, which establishes the algebraic identity $2/3 = \varphi^{-1} + \varepsilon$, where $\varphi^{-1} = (\sqrt{5} - 1)/2 \approx 0.6180$ is the reciprocal golden ratio and $\varepsilon = (4 - 3\sqrt{5})/6 \approx 0.0486$ is the safety constant. The identity is formally proven in Lean 4 against Mathlib v4.14.0 (246 theorems, 1,853 lines, zero custom axioms). We define a coherence metric $C = S/(S + N)$ and three testable propositions: (H_1) $C < 2/3$ predicts hallucination-class failure; (H_2) the interval $[\varphi^{-1}, 2/3]$ is a high-risk operational zone (the ε-gap); (H_3) governance regimes calibrated to coherence tiers outperform threshold-free regimes. The propositions are tested against three independent secondary datasets covering 465 language models, multi-domain hallucination audits, and supply chain deployments. Findings support all three and yield a four-tier runtime monitoring architecture (Green/Amber/Red/Black). The metric is compared with the NIST AI Risk Management Framework, the EU AI Act, and the SNR framework of Allen AI (2025). Limitations, threats to validity, and an empirical validation programme are discussed.

Introduction

Artificial intelligence has become mission-critical to enterprise management. Global enterprise AI spending reached $13.8 billion in 2024 (Menlo Ventures, 2024), yet adoption has outpaced reliability measurement. Enterprises lost an estimated $67.4 billion to AI hallucinations in 2024, with 82% of AI production bugs attributable to invisible hallucinations rather than system crashes (Testlio, 2025). Financial-services firms report hallucination rates of 15–25% on financial tasks, and the average time to discover an AI-generated error reaches 3.7 weeks (Four Dots, 2026). Deloitte (2025) finds that 47% of executives made major decisions based on unverified AI content. The fundamental challenge is the absence of a universal, mathematically grounded metric for AI reliability. Existing approaches rely on task-specific benchmarks — accuracy, precision, recall, F1 — that vary across domains and lack a unifying theoretical foundation (Dwivedi et al., 2021). The NIST AI Risk Management Framework identifies nine dimensions of trustworthiness but provides no single quantitative threshold delineating reliable from unreliable operation (NIST, 2023). The EU AI Act classifies systems by risk level but leaves specific reliability thresholds to individual organizations (European Parliament, 2024). The ISO/IEC 42001:2023 AI management system standard and the OECD AI Principles (updated 2024) similarly emphasize process governance over numeric thresholds (ISO/IEC, 2023; OECD, 2024). The result is regulatory arbitrage: identical systems may be judged compliant in one jurisdiction and non-compliant in another. Bengio et al. (2024) characterize this gap as the central obstacle to managing extreme AI risks, while Hendrycks, Mazeika and Woodside (2023) note that the absence of operational reliability thresholds compounds catastrophic-risk exposure.

Research question and hypotheses

This paper addresses one central question: “Does a mathematically derived, domain-independent threshold exist that separates reliable from unreliable AI operation across enterprise management contexts, and if so, what governance architecture follows from it?”. We propose that the fraction 2/3 — a critical boundary in Byzantine fault tolerance (Pease, Shostak and Lamport, 1980), turbulence scaling (Kolmogorov, 1941) and quantum error correction (Error Correction Zoo, 2024) — is algebraically determined. The El Ghandour Identity Theorem establishes that $2/3 = \varphi^{-1} + \varepsilon$, where $\varphi-1$ is the reciprocal golden ratio and ε the residual safety margin. We define coherence as $C = S/(S + N)$ and advance three testable propositions:

H_1 (Threshold validity): AI systems with $C < 2/3$ exhibit hallucination-class failures at materially higher rates than systems with $C \geq 2/3$.

H_2 (Epsilon-gap risk): The interval $[\varphi^{-1}, 2/3]$ — the ε-gap — constitutes a distinct, high-risk operational regime in which systems pass basic functionality tests but produce unreliable outputs.

H_3 (Governance utility): Risk-proportionate governance regimes calibrated to coherence tiers outperform uniform or threshold-free regimes on a combined safety–efficiency criterion.

Section 2 reviews the literature. Section 3 develops the mathematical foundations and coherence metric. Section 4 sets out methodology. Section 5 reports findings against H_1–H_3, derives a runtime monitoring architecture and applies it to a supply chain case study, and compares the framework with existing approaches. Section 6 includes conclusion and detailed discussion.

Literature Review

Theoretical Framework

Single-metric evaluation has proven inadequate for LLMs in enterprise settings: a model can be highly accurate on benchmark data yet hallucinate on adjacent domains (Ji et al., 2023). Ji et al.'s (2023) ACM Computing Surveys synthesis defines hallucination as generated content that is unfaithful to the source (intrinsic) or unverifiable against world knowledge (extrinsic). Subsequent surveys extend this taxonomy: Huang et al. (2024) catalogue hallucination across LLM principles and mitigation; Zhang et al. (2023) systematize input-, context- and fact-conflicting categories; Bang et al. (2023) demonstrate ChatGPT hallucination rates exceeding 30% on reasoning tasks. The converging taxonomy establishes hallucination as a property of the input–output relation — precisely what $C = S/(S + N)$ captures. The broader AI safety literature reinforces this. Amodei et al. (2016) identified concrete safety problems (reward hacking, distributional shift, safe exploration) that any reliable AI must mitigate. Russell (2019) frames provable reliability as the central control problem; Bostrom (2014) and Floridi and Cowls (2019) extend the framing to governance. Bender et al. (2021) caution that scaling alone may amplify failure modes. Lipton (2018) and Doshi-Velez and Kim (2017) argue that interpretability is necessary but insufficient — a model can be interpretable yet unreliable — motivating an output-level reliability metric independent of interpretability.

The NIST AI Risk Management Framework organizes trustworthiness into nine dimensions — accuracy, reliability, resiliency, objectivity, security, explainability, safety, accountability and

privacy — but is deliberately qualitative (NIST, 2023). Industry frameworks complement this picture: Anthropic's (2023) Responsible Scaling Policy defines AI Safety Levels (ASL-1 through ASL-4) based on capability thresholds; IEEE 7000-2021 establishes a process model for ethical concerns in system design (IEEE, 2021). The AI Decision SLOs framework (Avula, 2026) is more operational, defining measurable targets for decision accuracy, policy compliance, trust stability, drift detection latency, escalation frequency and autonomy stability — yet thresholds remain organization-specific. STAC Research (2025) advocates for trust thresholds calibrated to consequence and reversibility but stops short of proposing a universal value.

Signal-to-noise ratio in AI evaluation

Signal-to-noise reasoning has deep information-theoretic roots: Shannon (1948) established channel capacity as a function of SNR; Cover and Thomas (2006) and MacKay (2003) extend this to modern inference. The Allen Institute for AI (2025) operationalizes the framing for AI evaluation: in 465 language models across 30 benchmarks and 14 model sizes, higher-SNR benchmarks more reliably distinguish model quality ($R2 = 0.626$ with decision accuracy). Their formulation — signal as the maximum normalized difference between model pairs, noise as the standard deviation across training checkpoints — is structurally identical to $C = S/(S + N)$, providing independent empirical validation, though Allen AI do not derive a universal threshold.

The 2/3 threshold in distributed systems

Pease et al. (1980) proved that reliable consensus among n processors tolerating m Byzantine faults requires $n > 3m$; equivalently, the loyal fraction must strictly exceed 2/3. This is an impossibility theorem: below 2/3 loyalty, no algorithm can guarantee consensus. Lamport et al. (1982) generalized the result to authenticated and unauthenticated message regimes. Castro and Liskov (1999) operationalized the bound in Practical Byzantine Fault Tolerance (PBFT), and Yin et al. (2019) further extended it in HotStuff, achieving linear communication complexity while preserving the 2/3 threshold. Modern proof-of-stake blockchains, including Ethereum's Casper consensus mechanism (Buterin and Griffith, 2017), embed the same 2/3 boundary in their finality logic. The 2/3 bound is therefore not a heuristic but a tight, proven boundary, applied consistently across four decades of distributed-systems research.

The 2/3 threshold in physics and other domains

Kolmogorov's (1941) second-order structure function for the local velocity increments in fully developed turbulence scales as r (2/3), the "two-thirds law". The boundary recurs in quantum error correction: the GKP-XZZX surface code achieves a fault-tolerance threshold of 0.67, deviating from 2/3 by +0.003 (Error Correction Zoo, 2024). In materials science, the glass transition temperature is empirically T ≈ (2/3) T. The golden ratio itself appears gm extensively across natural and engineered systems (Livio, 2002; Dunlap, 1997), from phyllotaxis to optimal-search algorithms, suggesting that φ−1 demarcates a stability boundary that humans and natural processes have repeatedly converged upon. These independent recurrences motivate the question of whether 2/3 has algebraic rather than empirical origin — the question the El Ghandour Identity answers.

Synthesis and gap

The literature establishes that (i) AI reliability requires more than task accuracy, (ii) signal-to-noise framings are predictive, (iii) the 2/3 boundary recurs across independent technical domains, and (iv) no current framework offers a mathematically derived universal threshold. This paper closes the gap by deriving such a threshold from algebraic identity and proposing the governance architecture it implies.

Mathematical Foundations

The El Ghandour Identity Theorem

In the algebraic number field Q (√5), $2/3 = \varphi^{-1} + \varepsilon$ (Equation 1)

Where $\varphi^{-1} = (\sqrt{5} - 1)/2 \approx 0.6180$ (Equation 2)

$\varepsilon = (4 - 3\sqrt{5})/6 \approx 0.0486$ (Equation 3)

The identity is algebraically exact. It has been formally verified in the Lean 4 proof assistant against Mathlib v4.14.0, comprising 246 theorems across 1,853 lines of Lean code with zero sorry statements and zero custom axioms. The identity lives in Q (√5), the smallest field extension of Q containing the golden ratio. Equation 1 reveals that 2/3 is not arbitrary: it is the sum of a natural stability boundary (φ^{-1}) and a minimum safety constant (ε).

The coherence metric

We define the coherence of an AI system as $C = S / (S + N)$ (Equation 4), where, S is the signal component (correct, relevant, factually grounded outputs) and N is the noise component

(hallucinations, irrelevant outputs, fabricated information). C is bounded in [0, 1]: C = 1 represents perfect coherence; C = 0 represents pure noise. The formulation draws on Shannon's (1948) information theory, in which channel capacity is determined by signal-to-noise ratio (Cover and Thomas, 2006; MacKay, 2003). The critical claim is that $C \geq 2/3$ establishes a universal reliability threshold. When C drops below this boundary, the noise component exceeds half the signal (N > S/2), and the system enters a regime in which hallucinated outputs proliferate faster than reliable outputs. The connection to Shannon's channel capacity is instructive: for a binary symmetric channel with crossover probability p = 1/3, the binary entropy H(1/3) = 0.918 bits, giving channel capacity $C_{Shannon}$ = 0.082 bits per channel use — the minimum capacity at which meaningful communication is possible.

The six-dimensional coherence framework

Overall coherence of an AI management system is assessed as a weighted sum across six dimensions: $C_{6D}(x, t) = \Sigma w_i \cdot C(x_i, t_i) \geq 2/3, i = 1, \ldots, 6$ (Equation 5), where, each C_i [0, 1] and $\Sigma w_i = 1$. Table 1 specifies the dimensions and example operational metrics. Weights w_i are domain-specific and must be calibrated empirically (a limitation discussed in section 6). We adopt Ji et al.'s (2023) faithfulness-based definition and operationalize it within the coherence framework: an output is hallucinatory when it contributes to N rather than S. Aggregated at system level, hallucination-class failure is defined as the condition $C_{6D}<2/3$.

Dimension	Description	Example Metric
C_1: Spatial	Consistency across data inputs and contexts	Cross-validation accuracy across regions
C_2: Temporal	Stability over time; resistance to drift	Performance degradation rate over 30/90/180 days
C_3: Depth	Recursive decomposition; sub-component coherence	Coherence of individual model components
C_4: Cross-domain	Consistency across management functions	Agreement between HR, finance, operations AI
C_5: Semantic	Factual alignment with verified knowledge	Hallucination rate; fact-checking score
C_6: Operational	Alignment between AI outputs and feasible actions	Implementability score of recommendations

Table 1. Six dimensions of AI system coherence with example operational metrics

Methodology

Research design

We adopt a mixed-methods design combining (a) formal mathematical proof, (b) secondary empirical analysis against published datasets, and (c) illustrative case study. This is appropriate because the central claim has two components: an algebraic identity (requiring proof) and a

behavioural prediction (requiring empirical mapping). The design is consistent with theory-building methodology (Eisenhardt and Graebner, 2007) and the bounded-rationality tradition (Simon, 1955; Kahneman, 2011), under which managerial decisions are made under cognitive constraints that AI can compound rather than correct when operating below a reliability threshold.

Formal verification

The El Ghandour Identity (Equation 1) was verified in Lean 4 against Mathlib v4.14.0. Lean 4 was selected over Coq and Isabelle/HOL because (i) Mathlib provides native support for Q (√5) and the golden ratio; (ii) Lean 4's dependent type theory enables verification with zero hidden axioms; (iii) Lean proofs are independently re-checkable. Formal verification has precedent in safety-critical systems: Klein et al. (2009) verified the seL4 OS kernel in Isabelle/HOL; Leroy (2009) verified the CompCert C compiler in Coq. These precedents establish machine-checked proof as appropriate when the cost of error is catastrophic. The proof comprises 246 theorems across 1,853 lines and is available for re-verification.

Empirical mapping

To test H_1–H_3 we use three independent secondary datasets, selected because each was produced by an organization with no stake in the coherence framework:

(1) Allen Institute for AI (2025): 465 language models × 30 benchmarks × 14 model sizes, enabling computation of model-level signal-to-noise ratios directly mappable to C.

(2) Testlio (2025); Four Dots (2026); Forrester (2025): multi-domain hallucination audits in healthcare, legal, financial services and general enterprise contexts.

(3) ComplyFlow (2025); LiveView Technologies (2026); Supply and Demand Chain Executive (2025): supply chain AI deployment outcomes.

For each dataset we compute implied coherence as $C \approx 1 - e$ from reported error rates, under the assumption that reported errors approximate $N/(S + N)$. The mapping is conservative — it understates measured coherence — biasing tests against H_1.

Validity considerations

The empirical mapping is correlational. Construct validity is supported by Allen AI's (2025) finding that SNR predicts decision accuracy ($R_2 = 0.626$). External validity is limited to enterprise contexts; threats are addressed in section 6.

Findings

Threshold validity (H_1)

Table 2 maps published hallucination rates onto implied coherence across four domains spanning two orders of magnitude in failure severity. The pattern is consistent with H_1: domains with C well below 2/3 (Healthcare at $C \approx 0.61$; Legal at $C < 0.20$) exhibit catastrophic failure modes — fabricated legal citations (Four Dots, 2026) and fabricated medical references (Testlio, 2025) that propagate as confident-sounding falsehoods. Domains operating above 2/3, even narrowly (Finance at C = 0.75–0.85), exhibit recoverable error modes. The Testlio (2025) finding that 82% of AI production bugs are invisible hallucinations rather than crashes is consistent with Ji et al.'s (2023) prediction that coherence degradation manifests as subtle signal corruption rather than overt system failure, and aligns with Huang et al.'s (2024) taxonomy of extrinsic hallucination as the dominant failure mode in deployment. The empirical pattern across all five domain rows is consistent with H_1: H_1 is supported.

Domain	Hallucination Finding	Implied C	C vs. Threshold
Healthcare	69 of 178 AI medical references fabricated	$C = 109/178 \approx 0.61$	Below φ^{-1} (CRITICAL)
Legal	83% encountered fabricated case law	$C \approx 0.17$ (lower bound)	Far below threshold (CATASTROPHIC)
Finance	15–25% hallucination on financial tasks	C = 0.75–0.85	Above 2/3 (SAFE but low margin)
Customer Service	Standard chatbot deployments	C varies widely	Depends on RAG implementation
General Enterprise	82% of AI bugs are invisible hallucinations	$C_{VISIBLE}$ much greater than C_{ACTUAL}	Hidden risk

Table 2. AI hallucination rates across enterprise domains mapped to coherence values. Sources: Testlio (2025); Four Dots (2026); Forrester (2025)

The epsilon-gap (H_2)

The interval $[\varphi^{-1}, 2/3] \approx [0.618, 0.667]$ — width $\varepsilon \approx 0.0486$ — emerges as a distinct regime: systems pass basic functionality tests (above φ^{-1}) but fall below the coherence threshold. Forrester's (2025) $14,200 annual verification cost per employee concentrates here — outputs are plausible enough to act on, but unreliable enough to require re-checking. H_2 is supported.

Governance utility (H_3)

Amazon's (2025) Uncertainty-Aware Fusion framework achieves 8% improvement over the best single model by weighting LLMs by accuracy and self-assessment quality, exploiting the fact that

different models rarely produce identical hallucinations. PNAS (2025) confirms LLM ensembles match human crowd forecasting accuracy through simple aggregation. Both instantiate the Byzantine prediction (Pease et al. 1980): when more than 2/3 of sources are reliable, the aggregate is trustworthy. Chain-of-Verification (ACL, 2024) achieves 28% factuality improvement; Retrieval-Augmented Generation raises semantic coherence (C_5) by up to 71% (Four Dots 2026). Each technique succeeds by raising one or more C_1 above threshold. H_3 is supported.

Application: Runtime Monitoring Architecture

Findings of this paper map directly onto a four-tier runtime monitoring architecture (Table 3). Each tier follows from a specific finding: the Black Zone from the catastrophic-failure pattern below φ^{-1} (Healthcare, Legal in Table 2); the Red Zone from the ε-gap finding; the Amber Zone from the marginal-coherence Finance pattern; the Green Zone from the Byzantine bound plus the ε safety margin.

Tier	Coherence Range	Status	Organizational Response	Derived From
Green Zone	$C \geq 2/3 + \varepsilon$ (≥ 0.715)	Full autonomy	Automated operation; quarterly audit	Byzantine bound + ε margin
Amber Zone	$0.667 \leq C < 0.715$	Supervised	Human-in-the-loop; weekly review	Finance pattern (Table 2)
Red Zone	$0.618 \leq C < 0.667$	Restricted	All decisions require human approval	ε-gap finding (§5.2)
Black Zone	$C < \varphi{-}1$ (< 0.618)	System halt	Immediate shutdown; root-cause analysis	Sub-$\varphi{-}1$ catastrophic pattern

Table 3. Four-tier runtime monitoring architecture derived from Sections 2–5

Implementation leverages existing MLOps infrastructure: Kolmogorov–Smirnov tests, Stability Index and Jensen–Shannon divergence track each C_i continuously (Monte Carlo Data, 2025). The EU AI Act, ISO/IEC 42001:2023 and OECD AI Principles all align with this architecture (European Parliament, 2024; ISO/IEC, 2023; OECD, 2024).

Case study: Autonomous supply chain management

Supply chain management is an instructive application: 67% of supply chain executives report that their organizations have fully or partially automated key processes using AI (ComplyFlow, 2025). The operations-management literature establishes the empirical basis: Choi, Wallace and Wang (2018) document how big-data analytics reshape operations decision-making; Dubey et al. (2020) show that AI and big-data analytics improve operational performance under specific organizational

conditions; Mikalef and Gupta (2021) demonstrate that firm-level AI capability is a multidimensional construct correlated with measurable performance gains. Consider a supply chain comprising five interacting AI subsystems — demand forecasting, inventory optimization, supplier risk, logistics routing, automated compliance — each with its own C_i. Early adopters report a 15% reduction in logistics costs, 35% decrease in inventory levels, and 65% improvement in service levels (ComplyFlow, 2025). When any subsystem's coherence drops below 2/3, cascading failures propagate: a demand-forecasting hallucination ($C_1 < 2/3$) causes inventory over-ordering, logistics reconfiguration for non-existent demand, and false compliance alerts. LiveView Technologies (2026) documents this empirically — when detection confidence drops below threshold, systems escalate to human operators, precisely the Red-Zone protocol of Table 3. ComplyFlow (2025) reports automated document review reduces contractor onboarding time by 60–80%, contingent on maintaining coherence; when verification AI hallucinates approval for a non-compliant contractor, downstream penalties exceed efficiency savings. The coherence threshold provides the criterion.

Comparison with Existing Frameworks

The differentiator is the mathematically derived threshold. Existing frameworks leave threshold-setting to organizations, creating regulatory arbitrage; the 2/3 threshold emerges from the algebraic structure of the golden ratio (Theorem 1) and is independently validated by its appearance across physics, distributed systems and quantum error correction (Sections 2.3–2.4).

Framework	Scope	Threshold Type	Relation to Coherence
NIST AI RMF (NIST, 2023)	9 trustworthiness dimensions	Qualitative; no numeric threshold	Maps onto C_1 –C_6
EU AI Act (EP, 2024)	4 risk levels	Categorical; non-quantitative	Risk levels correspond to C ranges
AI Decision SLOs (Avula, 2026)	Decision accuracy, compliance, stability	Quantitative per organisation	Each SLO maps onto a C_i
SNR Framework (Allen AI, 2025)	LLM benchmark evaluation	Relative; no absolute threshold	Structurally identical: $C = S/(S + N)$
El Ghandour Coherence Metric	6D coherence across domains	$C \geq 2/3$ (algebraically derived)	Universal; subsumes the above

Table 4. Comparison of the El Ghandour coherence metric with existing AI evaluation frameworks

Conclusion and Discussion

This paper introduced the El Ghandour Identity Theorem and the universal coherence metric $C=S/(S + N) \geq 2/3$ derived from it. The decomposition $2/3=\varphi^{-1}+\varepsilon$ reveals the 2/3 threshold not as

convention but as the sum of a stability boundary and a minimum safety constant, algebraically determined and formally verified. Three hypotheses (H_1: threshold validity; H_2: ε-gap risk; H_3: governance utility) are supported by triangulated secondary evidence. The framework yields a four-tier runtime monitoring architecture, a procurement standard, and a regulatory bridge across the NIST and EU regimes. As AI assumes greater autonomy in enterprise management, the need for universal reliability metrics is not only desirable but mathematically necessary. The coherence metric offers a path toward AI systems that are not merely highly available but reliably correct.

Study Implications

Three implications follow. First, the framework provides a single summary number, C6D, communicable to non-technical stakeholders. Board members and executives need not understand precision/recall trade-offs; they need to know whether C exceeds 2/3. This addresses what March and Olsen (1972) characterized as the "garbage-can" pathology of organizational decision-making, in which problems, solutions and decision-makers are loosely coupled. A single threshold metric tightens this coupling. Second, the framework enables risk-proportionate investment in AI governance: Green-Zone systems require light-touch monitoring, Amber-Zone systems require enhanced oversight, Red-Zone systems require immediate intervention. This is consistent with Taleb's (2012) antifragility principle — systems that absorb stress at lower tiers without escalating to higher-cost interventions. Third, the ε safety constant provides a quantitative basis for AI procurement: organizations can require demonstration that $C \geq 2/3 + \varepsilon$ under representative conditions, standardizing acceptance independently of task or domain.

Limitations and threats to validity

We acknowledge five limitations. ***(L1) Construct calibration.*** The mapping from domain-specific performance metrics to C requires validated measurement instruments not yet developed. (L2) Weight specification. The weights wi in Equation 5 are domain-specific; this paper specifies the structure, not values. ***(L3) Mapping assumption.*** The implied-C calculation ($C \approx 1- e$) is conservative but coarse; finer mappings may shift specific row values in Table 2 without altering the threshold logic. ***(L4) Sample dependency.*** Findings rely on secondary datasets; primary collection in a single firm is needed to test internal validity. **(*L5) Scope.*** External validity is claimed only for enterprise management AI; consumer-facing and embodied AI are outside scope. Threats are partly mitigated by triangulation across three independent datasets and the conservative

mapping direction (biasing against H_1). The 2/3 threshold is mathematically derived (Theorem 1) and not subject to empirical refutation; only the mapping between C and observed failure rates is.

Generalizability

The framework generalizes to any AI system whose output partitions into signal and noise, encompassing current generative and predictive AI in management. It does not extend to reinforcement-learning where reward sparsity makes S/N partitioning ill-defined; this is a research priority.

Future research

Priorities are: (i) developing validated measurement instruments for each C_i; (ii) calibrating w_i across management domains through firm-level field studies; (iii) longitudinal validation of the four-tier architecture against safety and efficiency outcomes; (iv) extension to reinforcement-learning and embodied AI; (v) integration with emerging regulatory regimes (EU AI Act, NIST AI RMF revisions).

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EXAMINING THE IMPACT OF AI AGENTS ON DATA SCIENTISTS' SKILLS

Papageorgiou, Giorgos[1]; Lekakos, George[1]

[1]Department of Management Science and Technology, Athens University of Economics and Business, Athens, Greece

Abstract

The growing adoption of AI agents marks a new inflection point for data science, as agentic systems increasingly execute multi-step analytical workflows across the data-science pipeline. This study examines the positioning of AI agent tools across the data-science pipeline and how their documented use reshapes the allocation of work between data scientists and AI systems. Treating six representative tools as witness cases, we reconstruct documented workflows to provide an existence proof of agentic coverage across all pipeline stages and synthesize recurring patterns in human–agent collaboration. The analysis demonstrates that AI agents assume responsibility for multi-step execution across the full pipeline, producing concrete analytical artefacts. In these workflows, the data scientist's contribution shifts toward directing agent execution and validating actions through inspection of intermediate artefacts. Building on an established competency framework, the paper articulates two agent-oriented skill extensions—Agent Steering and Agent Process Tracing—that capture these emerging responsibilities for data professionals.

Keywords: Artificial intelligence, AI Agents, Data Pipelines, Data Scientist skills

Introduction

Over the past two decades, organisations have transitioned from intuition-led decision-making to data-driven optimization, placing the data scientist at the center of organisational analytics. In practice, data scientists coordinate work across multiple stages—sourcing and preparing data, exploring and modeling it, and communicating results into decisions and deliverables. Today, this role faces another inflection point with the emergence of AI agents: goal-oriented systems that can plan, use tools, and iteratively refine multi-step workflows, producing concrete analytical artefacts such as structured datasets, code, models, or visualizations.

Unlike earlier forms of automation and single-turn AI assistance, AI agents increasingly support iterative, multi-step execution within specific stages of the data-science pipeline, often in close interaction with human users. Because these systems generate intermediate and final artefacts—

such as transformation steps, SQL queries, or narrative outputs—that shape the analytical process, the central issue is not only what AI can produce, but how analytical work is distributed and coordinated between humans and AI systems in practice.

Against this backdrop, this paper examines how AI agent tools are positioned across the data-science pipeline and how their use reshapes human–AI task allocation. Specifically, the study addresses two research questions: (RQ1) Where are AI agent tools present across the stages of the data-science pipeline, and what roles do they play at each stage? and (RQ2) Which human skills are foregrounded for data scientists as AI agents increasingly mediate data-science workflows? The paper makes two main contributions. First, it provides a pipeline-wide mapping of AI agent tools, showing how they are represented across multiple stages of work and what types of artefacts they produce. Second, by consolidating recurring human-executed tasks, the study derives two agent-oriented skill extensions—Agent Steering and Agent Process Tracing—that expand upon established competency frameworks to capture how human expertise is exercised in agent-mediated environments.

Literature Review

Data scientist role and baseline skill set

While the "data scientist" has emerged as a cornerstone of modern analytics, the role's definition remains fluid, traditionally positioned at the intersection of statistics, computer science, and domain expertise. Because boundaries between data scientists, engineers, and analysts are frequently contested (Fayyad and Hamutcu, 2022), this study treats "data scientist" as an umbrella term for professionals across the data lifecycle. To establish a skill baseline, we adopt Vinay's (2024) framework, which consolidates technical, analytical, and professional competencies. It captures proficiency in programming and data tooling, statistical and analytical reasoning, exploration analysis and visualization, domain understanding, communication, structured problem solving, ethical awareness, and continuous learning (Vinay, 2024). This baseline provides the reference point for evaluating how agentic paradigms reshape human practice.

Data science pipeline as an organizing frame

Data-science work is organized as a pipeline where data is transformed into actionable outputs. These pipelines are iterative and non-linear, adapted to specific contexts to support maintainability and reusability (Biswas et al., 2022). We adopt the 11 canonical stages identified by Biswas et al. (2022) as our organizing lens: data acquisition, preparation, storage, feature engineering, modeling, training, evaluation, prediction/inference, interpretation,

communication, and deployment. Following this framework, deployment is treated as an ongoing operational phase rather than a one-off release: once a solution is installed, its performance is monitored over time so it can be maintained and improved. Interpretation is defined as downstream post-processing of prediction/inference outputs to translate them into decision-relevant understanding; for instance, while numerical outputs alone may be insufficient, visualization can help stakeholders make decisions (Biswas et al., 2022). This framing is essential for accurately positioning agentic AI tools that support operational and interpretative tasks within the empirical mapping that follows.

AI agents and multi-agent systems

In the classical AI literature, an agent is defined as "anything that can be viewed as perceiving its environment through sensors and acting upon that environment through actuators" (Russell and Norvig, 2020). Because this study examines modern data-pipeline tools, we adopt a contemporary, LLM-era framing. In this context, AI agents are modular systems enabled by Large Language Models for task-specific automation, defined as autonomous software programs that perform specific tasks (Sapkota et al., 2026). Key characteristics include autonomy, task-specificity, and reactivity to real-time stimuli such as user requests, external API calls, or state changes in software environments. This framing also extends to agentic AI systems—explicitly framed as multi-agent systems—which consist of multiple AI agents collaborating to achieve complex goals (Sapkota et al., 2026). Accordingly, our review includes AI tools that operate as either single-agent or multi-agent systems.

Current context and research focus

Recent evidence suggests that AI agents are transitioning from experimental prototypes toward real-world deployment, with many organisations expecting to adopt them in the near term (World Economic Forum, 2025a). Simultaneously, employer-focused evidence indicates that AI-related capabilities are becoming an important labor-market signal; the Future of Jobs Report 2025 notes that two-thirds of surveyed employers plan to hire talent with specific AI skills (World Economic Forum, 2025b).

Yet two gaps remain. First, despite this momentum, the literature has not systematically mapped where AI agents are emerging across the data-science pipeline, leaving unclear whether agentic coverage is concentrated in specific stages or extends pipeline-wide. Second, established competency models such as Vinay's (2024) treat the data scientist as the executor of analytical work, while agentic systems increasingly take over that execution—raising the question of which human competencies are foregrounded when AI carries out multi-step workflows.

Research Design and Methodology

Methodological positioning and research design

This study adopts a documentation-based comparative case analysis to examine how AI agents are positioned across the data-science pipeline (RQ1) and which human tasks persist as agents mediate analytical workflows (RQ2). Both questions concern the design intent of agentic systems rather than their empirical performance or adoption in practice, making official documentation the appropriate evidence base. The study therefore follows Bowen's (2009) document analysis method and applies Merriam and Tisdell's (2016) multi-case logic, in which each tool's documented workflow is treated as a distinct case: first examined through within-case reconstruction and then integrated through cross-case synthesis to surface recurring patterns. The analysis proceeds through four steps:

Workflow Reconstruction: For each tool, evidence is drawn exclusively from sources authored by its developers—official product documentation, technical papers, and developer-authored technical articles—and synthesized to reconstruct the full end-to-end operational workflow. This ensures that the reconstructed workflow reflects the tool's prescribed operation rather than third-party interpretation.

Task Decomposition: These reconstructed workflows are decomposed into discrete, granular tasks to facilitate a high-resolution analysis of the work process.

Rule-based Task Attribution: Each identified task is assigned a performer (Human vs. AI) based directly on the operational language prescribed in the documentation: a task is coded as Human when the documentation explicitly prescribes user action (e.g., the user *submits*, *reviews*, or *provides input*) and as AI when it describes system execution (e.g., the system *generates*, *retrieves*, or *produces*). Because attribution follows documented operational language rather than researcher interpretation, the procedure is replicable: another researcher applying the same rules to the same documentation would reach the same coding.

Evidence Synthesis: Case evidence is aggregated to address the research questions. For RQ1, data is synthesized to map tool presence and functionality across the 11 stages identified by Biswas et al. (2022). For RQ2, human-executed tasks from all tables are consolidated into a cross-tool catalogue, grouped into clusters of similar tasks, and translated into corresponding skills following the JRC task-skill framework (Rodrigues et al., 2021), providing the empirical basis for the proposed skill extensions.

Case selection and evidence base

Cases were selected through stratified logic in which every canonical stage of the Biswas et al. (2022) data-science pipeline is covered by at least one witness case, providing existence proof of agentic coverage across the full pipeline (RQ1). Three inclusion criteria were applied: (i) the tool must exhibit agentic behaviour—either explicitly labelled as such or demonstrably LLM-enabled, autonomous, task-specific, and reactive, consistent with Sapkota, Roumeliotis and Karkee (2026); (ii) its end-to-end workflow must be sufficiently documented in authoritative first-party sources to permit reconstruction without speculative inference; and (iii) it must map clearly onto a stage of the Biswas et al. (2022) framework. Among eligible candidates per stage, the tool with the most complete and transparent documented workflow was retained, yielding the cohort of six witness cases analysed below.

Empirical Analysis

Data acquisition with AD-AutoGPT

AD-AutoGPT is presented as an autonomous agent that leverages GPT-4 to execute a prompt-driven workflow for Alzheimer's disease infodemiology—i.e., the systematic collection and interpretation of online information signals (Dai et al., 2025). Starting from high-level user prompts (e.g., specifying topic, time window, and preferred sources), the system performs data acquisition by searching for Alzheimer's-related news via a Google API–based process and saving retrieved URLs and available metadata as a structured corpus (Dai et al., 2025). It then crawls the collected pages, summarizes article text, and produces structured information for downstream use, including spatiotemporal signals (locations derived via geoparsing and time derived from news metadata) and topic representations computed with LDA (Dai et al., 2025). Finally, the workflow supports interpretation of the corpus through analysis-oriented outputs and visualizations, such as location maps, time-based frequency plots (e.g., monthly counts), and topic-focused views (e.g., keyword summaries and intertopic distance/trend visualizations) (Dai et al., 2025). The tool records retrieved URLs and associated metadata as part of the structured corpus (Dai et al., 2025). This makes outputs traceable, enabling users to review the relevance and credibility of collected sources and, if necessary, issue follow-up prompts to refine or redirect the acquisition process.

#	Phase	Task Description	Performer
1	Goal Definition	Define specific instructions regarding data acquisition goal	Human
2	Source Discovery	Identify relevant online sources	AI
3	Data Extraction	Collect data & extract key information from text	AI

4	Data Structuring	Create structured, analysis-ready dataset	AI
5	Trend & Pattern Analysis	Detect temporal, spatial, and topic patterns	AI
6	Visualization Generation	Produce maps, timelines, and trend graphs	AI
7	Result Review	Assess outputs for relevance and accuracy	Human
8	Iterative Refinement	Adjust instructions and redirect the agent	Human

Table 1: AD-AutoGPT — Task Allocation.

Observation. The table shows the AI performing retrieval and structuring, while the human sets scope, reviews outputs, and redirects the workflow when needed.

Data preparation with Gemini in BigQuery

Gemini in BigQuery spans data preparation and storage by generating SQL-based transformation steps and materializing the results as persisted BigQuery tables in a cloud data-warehouse environment. In the documented workflow, the user may start with Gemini-suggested steps and/or provide their own natural-language prompt (via a description field) to specify an intended transformation; Gemini then generates the corresponding SQL expression and step description (Google Cloud, 2026a). The process is iterative: users can preview results, revise the prompt to regenerate the SQL expression, or edit the expression directly before applying the step, enabling refinement across successive transformations (Google Cloud, 2026b). The resulting artefacts are traceable and reusable within BigQuery, consisting of the generated SQL expressions and a destination table produced by running the sequence of steps (Google Cloud, 2026a). The user then assesses whether the output is satisfactory and either saves the preparation flow or continues iterating through further adjustments (Google Cloud, 2026a).

Google does not explicitly label Gemini in BigQuery data preparation as an agent. Accordingly, we treat it as exhibiting agent-like behaviour under our AI-agent framing, since its documented workflow supports task-specific automation from user prompts through iterative SQL generation and execution, with refinement based on intermediate results and user revisions—consistent with autonomy (within the tool), task-specificity, and reactivity (Sapkota et al., 2026).

#	Phase	Task Description	Performer
1	Start	Provide high-level natural language instruction	Human
2	Plan fixes	Generate multi-step plan of transformations	AI
3	Generate cleaning steps	Produce concrete SQL expressions	AI
4	Review	Inspect suggested steps	Human
5	Edit	Edit suggestions if needed	Human

6	Run & check results	Execute steps and produce cleaned table	AI
7	Finalize or continue	Decide whether further adjustments are needed	Human
8	Refinement loop	Update SQL when user provides new instructions	AI

Table 2: Gemini in BigQuery — Task Allocation.

Observation. The table indicates that the AI generates and applies transformations (as SQL), while the human defines intent, checks intermediate results, and iterates through revisions.

Multi-agent ML pipeline automation with MLZero

MLZero is presented as a multi-agent system designed to automate the core stages of the machine-learning pipeline, spanning feature engineering, modeling, training, evaluation and prediction. In the documented framework, inputs include the data and a brief task description or instruction, and the system decomposes the objective into coordinated subtasks handled by nine specialized agents distributed across perception, memory, and iterative coding modules (Fang et al., 2025). Operationally, the workflow begins with perception components that parse the task description and inspect available input files to establish the learning target and constraints, followed by a library-selection step that chooses an appropriate ML toolkit for the task. The system then enters an iterative coding loop in which code is generated, executed, evaluated, and revised using feedback from runtime logs and errors, supported by memory components that compress relevant documentation and retain prior failures to reduce repetition (Fang et al., 2025). The framework also allows optional user guidance during the iterative loop (i.e., optional per-iteration user input) when needed, while otherwise maintaining a high degree of automation. The documented outputs include executable training and inference scripts, run logs, trained artefacts, and task-specific prediction files, providing a traceable record of the automated pipeline execution (Fang et al., 2025).

#	Phase	Task Description	Performer
1	Problem framing	Define high-level ML objective & initial instructions	Human
2	Data access	Provide raw data folder	Human
3	Problem understanding	Analyse files/inputs & infer task/constraints	AI
4	Modeling setup	Select ML library	AI
5	Memory initialization	Initialize semantic & episodic memory	AI
6	Iterative coding	Provide/update per-iteration instructions	Human
7	Modeling	Generate training & inference code	AI
8	Execution	Execute code & analyse results	AI
9	Debugging	Summarize errors & retrieve relevant docs	AI
10	Iterative improvement	Refine and regenerate code	AI
11	Output generation	Produce predictions & artefacts	AI

12	Output validation	Inspect final outputs	Human
13	Re-orchestration (optional)	Restart workflow with updated instructions	Human

Table 3: MLZero — Task Allocation.

Observation. The table highlights automated planning/coding/execution by the system, while the human provides the objective and evaluates whether outputs satisfy the task.

Interpretation with Wren AI

Wren AI is described by its developers as an open-source GenBI agent and can be positioned primarily within the interpretation stage, where users query a connected database through natural-language questions (WrenAI, 2025e). In the documented workflow, the user submits a question in plain language and the system generates the underlying SQL and executes it against the connected data source to return results (WrenAI, 2025a). A central component supporting this behaviour is Wren's Modeling Definition Language (MDL), which provides a semantic layer for defining data models and relationships so that generated queries align with the intended organisational semantics (WrenAI, 2025d). Wren also exposes the executed SQL (e.g., via a 'View SQL' option), allowing users to inspect it (WrenAI, 2025a). After execution, Wren presents the answer as an integrated response that includes a concise textual summary and a preview of the resulting data (WrenAI, 2025c). The tool also supports visualization by automatically generating an appropriate chart for the returned results, which can be accessed in a dedicated chart view/tab (WrenAI, 2025b). In the chart view, users can request a regenerated chart (e.g. "Increase the font size"), which re-runs the visualization pipeline (WrenAI, 2025b).

#	Phase	Task Description	Performer
1	NL query interpretation	Submit question	Human
2	NL query interpretation	Interpret question & infer intent (LLM+MDL)	AI
3	SQL generation/execution	Generate & execute SQL statement	AI
4	Chart selection	Select, configure & render chart	AI
5	Insight generation	Generate narrative summary / report output	AI
6	Exploration	Inspect SQL	Human
7	Exploration	Revise question	Human
8	Exploration	Suggest follow-up questions	AI
9	Visualization customization	Request regenerated chart	Human
10	Visualization customization	Re-run visualization pipeline	AI
11	Final output	Review final answer	Human

Table 4: Wren AI — Task Allocation.

Observation. The table reflects AI-led query/visual generation from questions, with the human primarily steering the exploration through follow-up prompts and validation.

Presentation with PowerPoint Copilot

PowerPoint Copilot can be positioned in the communication and presentation stage, where it supports generating and refining slide decks from user intent expressed in natural language and from user-provided files (Microsoft, 2025a). In the documented workflow, the user provides a prompt (and may upload or reference supporting documents), after which Copilot extracts key points from the input and organizes them into an initial slide structure (Microsoft, 2025a). Copilot then generates slide text, applies layouts and basic styling within PowerPoint, and can draft speaker notes to accompany the slides (Microsoft, 2025b). The workflow is iterative: the user reviews the draft for accuracy and fit with the intended message and issues follow-up rewrite requests or edits to refine slide wording and structure as the deck evolves (Microsoft, 2025c).

Microsoft does not explicitly label PowerPoint Copilot as an "agent." We therefore classify it as agent-like under our AI-agent framing, as its documented LLM-enabled, prompt-driven workflow supports task-scoped slide generation and iterative refinement in response to user feedback—aligning with the agent features adopted in our literature framing.

#	Phase	Task Description	Performer
1	Prompting	Provide prompt with specific data & upload files	Human
2	Content Extraction	Extract key topics and structure	AI
3	Slide Structuring	Convert ideas into slide outline	AI
4	Slide Generation	Generate text content	AI
5	Design Automation	Apply layouts/styling and suggest images/icons	AI
6	Speaker Notes Drafting	Draft speaker notes	AI
7	Human Review	Verify accuracy	Human
8	Iterative Revision	Request rewrites	Human

Table 5: Microsoft PowerPoint Copilot — Task Allocation.

Observation. The table shows the AI generating and revising slide artefacts, with the human directing content goals and approving or correcting intermediate drafts.

Post-deployment troubleshooting with Gemini Cloud Assist Investigations

Gemini Cloud Assist investigations can be positioned within post-deployment operations (incident investigation and troubleshooting), which fall within the deployment stage as defined by Biswas et al. (2022), and is described as a root-cause analysis AI agent for diagnosing issues in cloud infrastructure and applications (Google Cloud, 2025). In the documented workflow,

the user starts an investigation in the Google Cloud console by describing the issue (and, when applicable, adding context such as a time window or affected resources) (Google Cloud, 2026c). The system then examines the operational data already available in the cloud environment—such as logs, configuration information, and metrics—and surfaces ranked Observations that summarize what it found, each linked to the underlying evidence so users can verify the basis of the finding (Google Cloud, 2026c). Finally, it synthesizes these observations into probable root-cause hypotheses and recommended next steps, and it supports iterative troubleshooting by allowing the investigation context to be revised and rerun as new information becomes available (Google Cloud, 2026c).

#	Phase	Task Description	Performer
1	Investigation setup	Describe the issue and define time window / scope	Human
2	Signal aggregation	Collect and correlate logs, configurations, and metrics	AI
3	Sense-making	Generate ranked observations from collected signals	AI
4	Diagnosis	Propose hypotheses and recommended fixes	AI
5	Evaluation	Assess hypotheses, inspect evidence	Human
6	Iteration or Resolution	Refine and re-run investigation if needed	Human

Table 6: Gemini Cloud Assist Investigations — Task Allocation.

Observation. The table indicates AI-led evidence synthesis into observations and recommended actions, with the human providing incident context and confirming next steps.

Results

Pipeline coverage of AI agent tools

This section synthesizes findings across cases to address RQ1, which concerns the presence and positioning of AI agent tools across stages of the data-science pipeline. Across the six cases examined, AI agent tools were identified in every major stage of the pipeline, spanning upstream data acquisition and preparation, core machine-learning workflows, interpretation, communication, and post-deployment operations. Although each tool targets specific pipeline stages, the cases collectively demonstrate that AI agent tools span the entire data-science pipeline. Figure 1 summarizes this mapping by situating each tool within the pipeline stage(s) it supports. The figure illustrates both the breadth of coverage and the functional diversity of AI agent tools across the end-to-end workflow, establishing the context for the cross-tool task

consolidation developed next (ML pipeline includes feature engineering, modeling, training, evaluation and prediction).

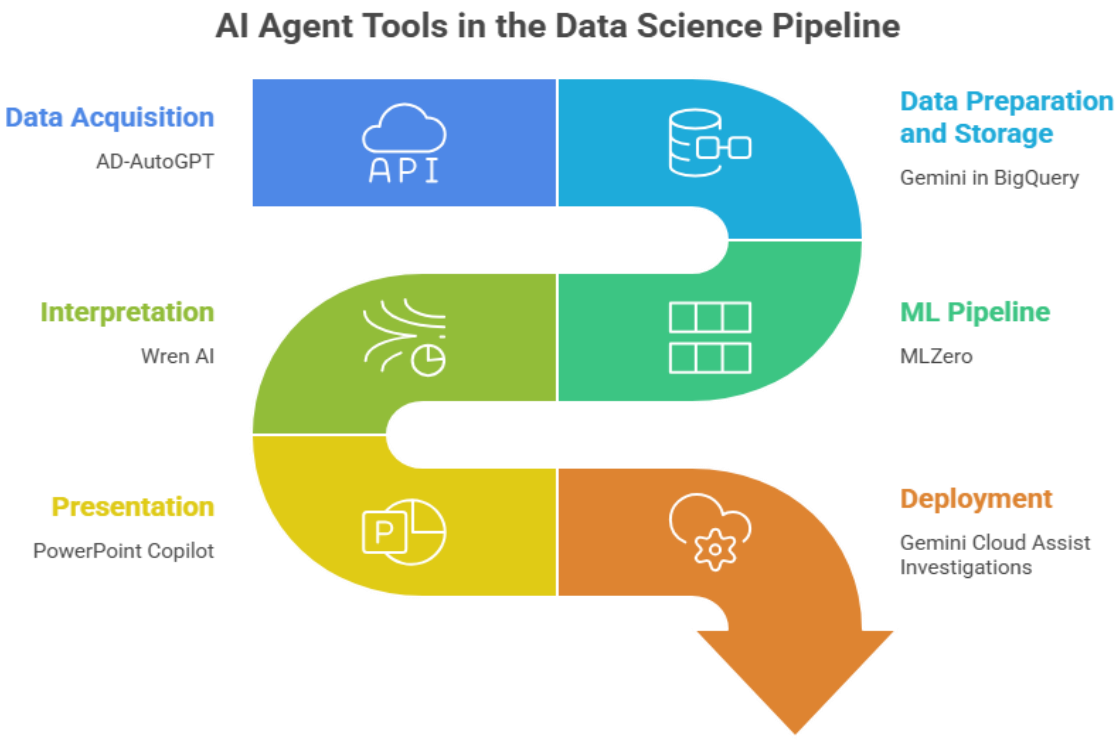


Figure 1: Mapping AI tools in the Data Science Pipeline, ML pipeline includes 5 stages. Visual elements generated with AI tool; conceptual design by the author.

Cross-tool consolidation of human tasks

We aggregated all human-executed tasks across the six AI agent tools into a single cross-tool catalogue. The tasks clearly converged into two dominant clusters (Table 7): Directive tasks initiate or redirect the agent's trajectory (e.g., setting goals, specifying constraints, refining instructions), whereas evaluative tasks involve inspecting intermediate artefacts and judging output reliability and acceptability.

Tool	Human task	Category
AD-AutoGPT	Define specific instructions regarding data acquisition goal	Directive
	Assess outputs for relevance and accuracy	Evaluative
	Adjust instructions and redirect the agent	Directive
Gemini in BigQuery	Provide high-level natural language instruction	Directive
	Inspect suggested steps	Evaluative
	Edit suggestions if needed	Directive
	Decide whether further adjustments are needed	Directive
Wren AI	Submit question	Directive
	Inspect SQL	Evaluative

	Revise question	Directive
	Request regenerated chart	Directive
	Review final answer	Evaluative
MLZero	Define high-level ML objective & initial instructions	Directive
	Provide raw data folder	Directive
	Provide/update per-iteration instructions	Directive
	Inspect final outputs	Evaluative
	Restart workflow with updated instructions	Directive
PowerPoint Copilot	Provide prompt with specific data & upload files	Directive
	Verify accuracy	Evaluative
	Request rewrites	Directive
Gemini Cloud Assist Investigations	Describe the issue and define time window / scope	Directive
	Assess hypotheses, inspect evidence	Evaluative
	Refine and re-run investigation if needed	Directive

Table 7. Cross-tool consolidation of human tasks.

From task clusters to skills

Translating these clusters into skill implications follows the European Commission Joint Research Centre task–skill framework. The framework defines a task as the smallest unit of work in an economic process and a skill as the ability to perform a task well, with clusters of similar tasks constituting task domains that correspond to skill domains (Rodrigues et al., 2021). Applied here, the Directive cluster forms a task domain centered on goal-setting and redirection, while the Evaluative cluster forms a task domain centered on artefact-based inspection and judgment; each corresponds to a distinct skill domain, yielding the two agent-oriented skills proposed below (see Figure 2):

Agent Steering (directive cluster). In research on agentic information systems, *steerability* is typically discussed as a property of the AI system—i.e., the extent to which an agent can be directed to align with user goals and values (Saffarizadeh et al., 2024). Building on this notion while shifting the locus of analysis to the user, we define *Agent Steering* as the human capability required to exploit steerable agents in practice: *the capacity of data professionals to actively guide and redirect an AI agent's workflow over time toward an intended outcome.* Agent Steering involves two interrelated abilities*: (i) articulating goals and prompts that are sufficiently clear and structured to guide the agent's operations; and (ii) formulating revised instructions that redirect the agent accordingly.*

Agent Process Tracing (evaluative cluster). The evaluative cluster is grounded in the logic of *process tracing*, which examines sequences and diagnostic evidence to understand how

outcomes are produced (Collier, 2011). Transferred to AI agent workflows, this becomes the ability to reconstruct and evaluate the agent's execution by reading its artefacts as evidence. We therefore define *Agent Process Tracing* as *the data professional's capacity to reconstruct and critically assess the path an AI agent has taken through a workflow by inspecting its intermediate and final artefacts*. This includes interpreting how intermediate outputs (e.g., steps, SQL, code, tables, visualizations, or narrative deliverables) relate to one another, inferring how the task was operationalized, and judging whether the resulting trajectory and outputs are methodologically appropriate and reliable.

In practice, the two skills function as a recurrent interaction cycle: steering initiates or redirects the workflow; process tracing evaluates the produced artefacts; and evaluation informs subsequent steering decisions. Building on Vinay's (2024) competency framework as a baseline, we propose these two skills as an additional, agent-oriented competency pillar. They draw on established capabilities (e.g., problem formulation, technical literacy, analytical judgment) but are distinguished by a different locus of action: governing and validating autonomous agent execution rather than directly performing most operational steps.

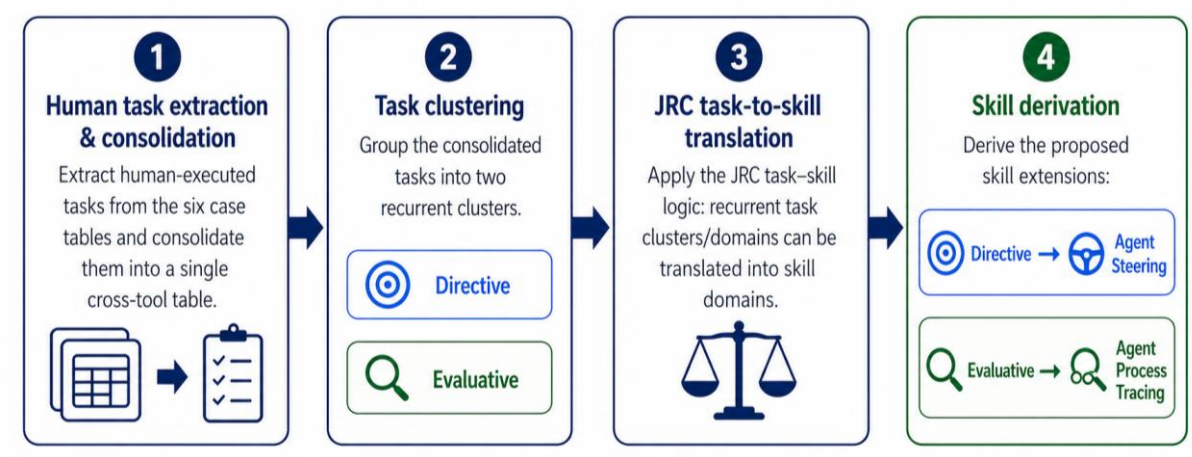


Figure 2: Empirical pathway from human tasks (Tables 1–6) to the proposed skill extensions, structured by the JRC task–skill framework. Visual elements generated with AI tool; conceptual design by the author.

Conclusion and Discussion

The emergence of AI agents marks a fundamental inflection point for data science, shifting the boundaries of automation from single-task execution to the autonomous management of complex workflows. Addressing RQ1, this study utilizes the six analysed tools as witness cases to provide existence proof of agentic coverage across all data pipeline stages, demonstrating that agentic workflows now span every stage of the data-science pipeline. From upstream acquisition to deployment, these cases illustrate how agents are assuming the operational

burden of producing analytical artefacts—code, models, and visualizations—thereby liberating professionals from traditional manual execution. However, this transition is not a story of human displacement, but one of profound role reconfiguration (RQ2). The data scientist's contribution is shifting from direct execution to strategic orchestration and critical validation. By synthesizing our findings, we propose two skill extensions that expand the established Vinay (2024) framework: Agent Steering and Agent Process Tracing. Steering represents the capacity to strategically guide agents toward intended goals, while Process Tracing enables the reconstruction and auditing of the agent's trajectory to ensure methodological integrity.

For practitioners, effective work with AI agents is now characterised by an evidence-based steer–trace–revise cycle: professionals define high-level objectives, monitor intermediate execution through the inspection of artefacts, and validate progress before accepting or refining outputs. For tool designers, these findings highlight urgent priorities for observability—exposing the agent's internal trajectory and action history—and controllability—providing explicit intervention points such as stepwise execution or manual overrides. Such design elements are essential for aligning agentic tools with the accountability and transparency demands of professional data work.

Limitations and Future Research

Two limitations should be noted. First, the rapid evolution of the agent ecosystem means that the analysis should be read as a contemporary snapshot, with documented workflows likely to expand and shift as new tools emerge. Second, the design-level focus of the study does not assess how well agents actually execute the workflows their documentation prescribes; execution quality and reliability under real-world conditions remain outside the scope. By mapping where AI agents are positioned across the data-science pipeline and identifying the skill extensions that emerge in agent-mediated work, the study provides a conceptual foundation for empirical follow-up.

Future research should test these skill propositions through primary data collection with practicing data scientists—using semi-structured interviews and questionnaires—to validate Agent Steering and Agent Process Tracing in practice and examine their impact on workflow quality.

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AI ADOPTION IN SMEs AS A CO-EVOLOUTIONARY PROCESS ACROSS ORGANIZATIONAL AND INSTITUTIONAL CONTEXTS

Faisal Shahzad, João J. Ferreira
Häme University of Applied Sciences, Finland
Universidade da Beira Interior and NECE – Research Centre for Business Sciences, Covilhã, Portugal; QUT - Australian Centre for Entrepreneurship Research, Brisbane, Australia

Keywords: Artificial intelligence, SMEs, organisational readiness, institutional environments, co-evolution, digital transformation, adaptive strategies, qualitative research.

Introduction

Artificial intelligence (AI) is becoming increasingly important for small and medium-sized enterprises (SMEs) seeking to improve innovation and competitiveness economies (Verhoef et al., 2021; Collins et al., 2021; Agarwal et al., 2022). Yet adoption remains uneven, particularly among resource-constrained firms. Existing research has largely emphasised firm-level capabilities while giving less attention to how institutional environments interact with organisational readiness. This matters because SMEs often depend on external ecosystems for knowledge, infrastructure, legitimacy and technological support. AI adoption should therefore be understood not only as a technological decision but as an institutionally embedded process.

Purpose, Aim and Objectives

This study examines how institutional environments shape AI adoption in SMEs and how these conditions interact with organisational readiness and firms' adaptive responses. It addresses the question: *How do institutional environments shape AI adoption in SMEs, and how does this process reflect the co-evolution of technological, organisational and societal dynamics?*

Literature Review and Theoretical Framework

Recent research portrays AI adoption as a capability-building process shaped by digital maturity, organisational resources and environmental conditions. Studies of SMEs highlight the importance of internal capabilities and dynamic capability development (Cimino et al., 2025; Sánchez et al., 2025). Organisational readiness also influences whether AI adoption produces meaningful firm-level outcomes (Chen and Tajdini, 2025). Building on a co-evolutionary perspective (Geels, 2002), this study integrates organisational and institutional perspectives and conceptualises AI adoption as a

recursive process in which organisational capabilities, institutional conditions and adaptive responses evolve together.

Methodology and Methods

The study adopts a qualitative design based on 27 semi-structured interviews conducted between November 2025 and January 2026 with SME decision-makers, policy actors and business-support experts. Participants represented manufacturing, services, retail and technology sectors and varied in their level of AI engagement. Data were analysed through an inductive, multi-stage coding process inspired by the Gioia methodology (Gioia et al., 2013), progressing from first-order concepts to second-order themes and aggregate dimensions.

Findings and Contribution

The findings reveal three interrelated dimensions. First, organisational readiness is constrained by capability gaps, fragmented data foundations, weak strategic alignment and limited resources. Second, institutional environments simultaneously enable and constrain adoption. Regulatory ambiguity, insufficient SME-specific support, and concerns about trust, privacy and data governance influence perceived risk and feasibility. Third, SMEs respond through adaptive strategies including incremental implementation, ecosystem collaboration, learning-by-doing and strategic flexibility.

AI adoption is therefore neither linear nor determined by technological availability alone. It emerges through recursive interaction between organisational readiness and institutional conditions, while adaptive strategies enable SMEs to manage uncertainty, access external knowledge and progressively build capabilities. The study contributes by moving beyond firm-centric and stage-based explanations and conceptualising AI adoption as an institutionally embedded, co-evolutionary process.

Originality and Value

The study integrates organisational readiness, institutional conditions and adaptive strategies within a process-based explanation of SME AI adoption. It also positions organisational readiness as an evolving boundary condition shaping firms' ability to benefit from institutional support.

Research Limitations

The qualitative design, relatively small sample and context-specific setting limit generalisability. Future research could test the framework quantitatively, compare institutional contexts and use longitudinal designs.

Theoretical and Practical Applications and Implications

Managers should prioritise employee skills, data foundations and strategically aligned pilot projects before large-scale implementation. External collaboration can compensate for capability gaps, while internal expertise should be developed progressively. Policymakers should provide clearer regulation, accessible SME-specific support and capability-building initiatives that move beyond awareness towards practical implementation.

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DIGITAL TRANSFORMATION IN PUBLIC HEALTHCARE: BEHAVIORAL, MANAGERIAL, AND SYSTEMIC CHALLENGES THROUGH AN NPM LENS

Lior Naamati-Schneider*[1] Vered Uziel[2] Rivka Sigal[2]

1. Health Systems Management Department, Jerusalem Multidisciplinary College (JMC)
2. Management Department, Jerusalem Multidisciplinary College (JMC)

Keywords: Digital transformation; Public healthcare; New Public Management; Fourth Industrial Revolution; Organizational readiness; Professional identity; Healthcare workforce

Abstract

Healthcare systems worldwide confront growing pressure to adjust to rapidly changing demographic, technological, and financial conditions. Rising life expectancy, increased multimorbidity, resource limitations, and the accelerated pace of technological innovation all contribute to an environment that demands new managerial approaches and reconfigured models of care (Counte et al., 2019; WHO, 2019). At the same time, the Fourth Industrial Revolution (4IR) is reshaping healthcare through artificial intelligence, data driven systems, and connected digital platforms, creating opportunities but also exposing systemic weaknesses (Ali et al., 2023; Kraus et al., 2021; Schwab, 2017; Xu et al., 2018). Against this backdrop, digital transformation has become a strategic priority for public healthcare organizations, although its implementation remains uneven and often constrained by human, organizational, and structural factors (Marques & Ferreira, 2020; Ricciardi et al., 2019; Trinh et al., 2025).

This study explores how clinicians, managers, and administrative staff working in public hospitals and HMOs in Israel perceive the integration of digital tools, and how they experience the behavioral and psychological challenges associated with digital transformation. Conceptually, the analysis draws on New Public Management (NPM), a reform paradigm that has shaped public services over several decades by promoting efficiency, performance measurement, and consumer oriented service logic (Hood, 1991; Pollitt & Bouckaert, 2017; Simonet, 2011). While NPM has supported the expansion of digital technologies intended to streamline services and enhance accountability, its application in healthcare has also raised concerns regarding reduced professional autonomy,

fragmentation, and the prioritization of metrics over relational care (Ricciardi et al., 2019; Naamati-Schneider, 2020).

The empirical basis of the study consists of 22 semi structured interviews with healthcare professionals working across public institutions in central Israel. Participants were selected through purposive sampling to capture a range of professional roles and organizational contexts in settings where digital initiatives were actively underway. Interviews examined experiences with specific tools, perceived benefits and stresses, the impact of digitalization on workflows, and reflections on organizational preparedness. All interviews were recorded with consent, transcribed verbatim, and analyzed using a categorical qualitative approach combining inductive and deductive coding (Josselson, 2013; Tsabar Ben Yehoshua, 2016). This allowed for the identification of patterns connected to broader governance and reform processes.

Four major themes emerged. First, professionals described significant gaps in digital infrastructure and integration across institutions. Hospitals, HMOs, and community clinics often operated incompatible information systems, impeding data sharing, duplicating administrative work, and complicating continuity of care. Although participants agreed that modernization was essential, fragmented digital ecosystems limited the benefits of technological investment and reflected the challenges of decentralization highlighted in NPM literature (De Morais Correia & Frank, 2025; Pollitt & Bouckaert, 2017).

Second, the findings reveal substantial variation in organizational readiness. Some units exhibited leadership support, structured training, and clear communication strategies that facilitated adoption. Others faced workload pressures, resource limitations, or skepticism among staff, leading to uneven uptake and internal disparities. Participants emphasized that digital change was often experienced less as an opportunity than as an externally driven requirement that intensified existing strains (Kraus et al., 2021; Simonet, 2011).

Third, professionals reported difficulty balancing technological demands with clinical realities. While digital systems improved access to information and enabled remote care, they also increased administrative burdens and introduced multiple interfaces that competed with direct patient interaction. Time constraints were intensified due to complex documentation requirements, a finding consistent with earlier research on the effects of electronic systems on physician workload (Sinsky et al., 2016; Keasberry et al., 2017). Digital reforms intended to enhance efficiency were therefore sometimes perceived as generating new layers of complexity and stress (Alotaibi et al., 2025).

Fourth, the analysis points to ethical tensions and concerns regarding professional identity. Many respondents felt that digital tools embedded managerial priorities that emphasized measurement, throughput, and standardization at the expense of clinical judgment and human centered care. Professionals expressed unease about the potential erosion of relational aspects of practice and the risk that digital metrics would overshadow care values such as trust, equity, and continuity (Ricciardi et al., 2019; WHO, 2019). These concerns align with broader debates about the implications of 4IR technologies for autonomy and professional culture (Xu et al., 2018).

Collectively, the findings indicate that digital transformation in healthcare extends far beyond technological upgrades. It is a socio technical process shaped by governance structures, resource allocation, organizational culture, and the lived experience of professionals. For digital reforms to succeed, managers must address systemic fragmentation, strengthen organizational capacity, and integrate human centered approaches that promote staff engagement and align digital development with professional and ethical values (Greenhill et al., 2021; Naamati-Schneider, 2023).

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DIGITAL TRANSFORMATION OF SMALL AND MEDIUM-SIZED ENTERPRISES: THE ROLE OF HUMAN RESOURCES MANAGEMENT

Siachou, Evangelia[1]; Kontaxi, Ioanna[2]; Stafyla, Amalia[3]; Nanos, Ioannis[4]; Kitsios, Fotis[5]

[1]Department of Economics, National and Kapodistrian University of Athens, Athens, Greece

[2]Department of Supply Chain Management, International Hellenic University, Katerini, Greece

[3]Department of Supply Chain Management, International Hellenic University, Katerini, Greece

[4]Department of Accounting and Information Systems, International Hellenic University, Thessaloniki, Greece

[5]Department of Applied Informatics, University of Macedonia, Thessaloniki, Greece

Keywords: Digital Transformation (DT), Human Resource Management (HRM), Small and Medium-sized Enterprises (SMEs)

Introduction and Scope

As the new technological advancements shape a new digital era in all aspects of the society, the implementation of new/cutting-edge technologies [e.g., Internet of Things (IoT), cloud computing, Artificial Intelligence (AI), etc.)] transforms digitally almost all organizations, operating in various sectors depending on their size and scope (Kallmuenzer et al., 2025).

Yet, the digital transformation of organizations does not simply conceptualize in the mere adoption of new technologies in various organizational aspects (e.g., processes and procedures; routine tasks and activities; customer care and services; etc.). Rather, it implies a set of technological, organizational and managerial well-coordinated sequence of actions (Kraus et al., 2022; Nicolás-Agustín, Jiménez-Jiménez and Maeso-Fernandez, 2021; Verhoef et al., 2021). This study, that is part of a broader research agenda, argues that digital transformation cannot be seen as a simple organizational change; but it should be part of the corporate strategy organizations design and implement to develop new business models. In this vein, the role of certain departments and business actors should be separately examined.

We aim, therefore, at investigating the role Human Resource Management (HRM) plays in the digital transformation of small and medium-sized enterprises (SMEs) operating in Greece. In doing so, it examines the extent to which digital technologies (tools and information systems)

are deployed by Greek SMEs, as well as the impact of HRM practices on their digital transformation.

Methodology and Methods

To address the study objectives, the concept of digital transformation and the role of HRM were discussed; while, the impact of HRM practices on the digital transformation of SMEs was also reflected. Such a review led us to carefully select the study constructs as follows: *digital transformation* was measured with 8 items from [Nicolás-Agustín, Jiménez-Jiménez and Maeso-Fernandez, 2021]; *HRM practices* were measured with 7 items from [Nicolás-Agustín, Jiménez-Jiménez and Maeso-Fernandez, 2021]. All scales measured using a five-point Likert scale with 1: strongly disagree; 5: strongly agree. Certain control variables were also used, i.e., gender, age, educational background, current work status, company size, annual turnover, activity sector, digital transformation strategy.

Data for the study were collected from founders, owners and senior executives of SMEs, operating in Greece with the use of an electronic structured questionnaire. Descriptive statistics, correlation analysis and simple linear regression were used to analyze the data for this study.

Main Findings and Contribution

The findings showed that SMEs largely use basic digital technologies and uncovered a spectrum of tools and new technologies applied by the SMEs operating in Greece. Such tools, include, among others, *social media* (88.3%), *cloud technologies* (61%), *CRM* (68.8%), *ERP* (59.7%), *HRMS* (54.5%). Yet, the SMEs lag significantly in the adoption of specialized/advanced cutting-edge technologies, such as *VR* (10.4%), AR (7.8%), *IoT* (26%) and *Blockchain* (20.8%). A significant number of SMEs of the study sample (45.45%) has not developed a clear as well as a documented digital transformation strategy. The statistical analysis also found that the positive correlation of the SMEs annual turnover with the level of digital transformation was confirmed. Such a finding is in alignment with the existing literature that supports that higher revenues allow organizations to allocate more financial resources in their attempt to be digitally transformed (Gkika et al., 2025). In addition, the study advocates the decisive role HRM and its fundamentals (e.g., teamwork, strategic decision-making, and cultivating a good work environment) play in the digital transformation of SMEs. In this vein, the study findings support a statistically significant positive effect of HRM on digital transformation, that explains 29.2%

of its total variance (Nicolás-Agustín, Jiménez-Jiménez and Maeso-Fernandez, 2021; Nga and Tam, 2025).

The study findings enable us to support that: (i) the role of HRM is highlighted as a critical strategic tool for the digital transformation of SMEs; (ii) the adoption of technology tools and the use of digital systems to monitor the digital transformation of small and medium-sized Greek enterprises becomes effective only when it's actively supported by specific practices (such as the promotion of teamwork, the empowerment of employees through participatory strategic decision-making, the creation of a good working environment, with an objective evaluation system and appropriate leadership); (iii) the alignment of employees with the vision and values of the company. In this way, organizational resistance could be overcome and an innovative, adaptive environment is cultivated, that is suitable for introducing new digital technologies to small and medium-sized enterprises. The study suggests executives to invest in teamworking, leadership and training (reskilling/upskilling) to enable the digital transformation of their organizations.

Study Limitations and Implications for Future Research

As commonly accepted by the scholarly research, the study presents limitations warrant further attention. Among others, as the study conducted in SMEs and the study sample is relatively small, is hard for us to support data generalizability. Furthermore, the 29.2% of the total variance in the digital transformation indicates the existence of other important factors, beyond HRM practices. As such, future research, may further investigate reasons disable SMEs to adopt new technologies as well as estimate underline mechanisms such as the role of digital culture and digital skills as mediators in the relationship between HRM and digital transformation.

Instead of a conclusion, HRM is an important business actor for SMEs to be digitally transformed. The use and the implementation of appropriate HRM practices such as teamwork, strategic decision-making and their alignment with the vision of the SMEs are recommended as antecedents to the digital transformation of the Greek SMEs. We hope that our study will help them toward this dimension and help them be in alignment to the new technological demands.

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FROM GREEN HRM TO SUSTAINABLE ACTION: THE MEDIATING ROLE OF PSYCHOLOGICAL OWNERSHIP

Anjali Bansal

Assistant Professor, Indian Institute of Management Lucknow

Keywords:

Green HRM, Green organizational climate, Psychological ownership, Sustainability, Sustainable HRM, Environmental behaviour, Green values.

Background and Introduction

The mounting pressure from global environmental challenges has obligated organizations to adopt sustainable practices, making sustainability a key strategic priority. Traditionally, organisations, for decades, have unintentionally indulged in non-sustainable work behaviours such as superfluous usage of papers, long communications, long daily travels, degraded employee physical and mental health, and abruptly planned air travel, resulting in the increased carbon footprints of their individuals, which has only added to the burden on the nature causing it to explode irreversibly and irreparably, prompting some organizations to take conscious actions towards the same. A careful investigation of employees from these environmentally conscious organisations enabled examining the importance of building a stronger foundation for sustainability by involving employees at the core of this goal. It raises a very prominent question: how can organisations encourage individuals to take ownership of environmental sustainability and to exhibit more environmentally conscious behaviours?

Despite mounting institutional pressures for sustainability, organisations grapple with translating green human resource management (Green HRM) into enduring employee attitudes and behaviours. Drawing on psychological ownership, this study elaborated on the intimate connection individuals develop with their organization's green goals when these goals align with their identity, making them ultimate stewards of environmental initiatives and thereby underscoring the importance of psychological ownership for sustainability and employee environmental behaviour.

Psychological ownership theory is pivotal for clarifying how individuals may develop an emotional attachment and a sense of ownership toward organisational sustainability

goals. green HRM practices such as efficiently utilizing physical space and infrastructure (Mandip, 2012; Dumont et al., 2017), introducing telecommuting (Ahmad, 2015), encouraging group travel (Alreahi et al., 2022), and online meetings (Hooi, 2022) along with a careful selection of environmentally conscious people (Mandip, 2012), are supposed to impact one's accountability and ultimately psychological ownership for sustainability.

Green HRM practices enhance psychological ownership for sustainability and employee environmental behaviour by shaping a Green Organisational Climate (GOC) that facilitates broad employee participation in sustainability initiatives. In this way, GOC acts as more than an aspirational ideal, embedding sustainability as a core organisational norm. Additionally, instilling green values in employees helps better align with a green organisational climate, ultimately enhancing employees' ownership and actual behavioural change towards sustainability. Individual green values (IGVs) influence how employees identify and respond to a GOC. Employees with deep IGVs are more inclined to perceive equivalence between the organisation's environmental goals and their own values, thereby deepening their psychological ownership (Nguyen et al., 2025).

Research Methodology

The study employs a two-wave cross-sectional dataset from 403 participants (806 data points total, collected four weeks apart) to test a moderated mediation model via structural equation modeling. It integrates institutional theory for green HRM adoption and studies the mediated relationship through green organizational climate and moderation through individual green values.

Findings and Implications

Results reveal a full moderated mediation through green organizational climate for psychological ownership for sustainability and a partial moderated mediation for employee environmental behavior. Institutional pressures drive green HRM to instil norms fostering a shared green climate, which links to outcomes, with individual green values strengthening these indirect effects. Theoretically, the model advances sustainability literature by linking institutional theory to psychological mechanisms and distinguishing intrinsic from organization-driven green behaviours. Practically, it informs HRM strategies like recruitment, green training, and performance systems to cultivate voluntary environmental stewardship, enhancing organizational legitimacy and

resilience.

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THE EFFECTS OF PROMOTION AND PREVENTION-ORIENTED JOB CRAFTING ON PROACTIVE CUSTOMER SERVICE PERFORMANCE: A MODERATED MEDIATION MODEL

Malik Muhammad Abdur Rahman [1]; Ghani, Bilqees [2]

[1] Business School, LUMS University, Lahore, Pakistan

[2] Institute of Business Management, Karachi, Pakistan

Keywords: Promotion-oriented job crafting, Prevention-oriented job crafting, Employee need satisfaction, Influence tactics

Introduction

Despite the inherent proactive nature of job crafting, there has been little research into the effects of job crafting on proactive customer service performance (PCSP). This research looks into how two different job crafting approaches—promotion and prevention—affect PCSP, with specific emphasis on the mediating role of employee need satisfaction. The study also looks into how proactive influence tactics like collaboration and pressure affect the relationships between job crafting approaches (promotion and prevention) and need satisfaction. The findings suggest that promotion-oriented job crafting considerably improves proactive customer service performance, whereas prevention-orientated job crafting has a negative direct effect. However, prevention-oriented job crafting positively predicts proactive customer service performance through the mediating path of employee need satisfaction. The findings also show that collaboration tactics moderate these relationships. The use of artificial neural network (ANN) analysis improves the study's robustness by validating and strengthen the structural equation modeling (SEM) results.

Purpose and Research Questions

This study examines the effects of job crafting on PCSP through the mediating mechanism of employee need satisfaction. It also investigates how influence tactics moderate these relationships.

RQ1 How do PRO-O and PRE-O JC impact PCSP directly and indirectly?

RQ2: Does employee need satisfaction mediate these effects?

RQ3: How do collaborative and pressure tactics moderate the JC–need satisfaction link?

Theoretical Framework and Literature Review

SDT posits that autonomy, competence, and relatedness drive motivation and performance (Deci et al., 2017). PRO-O JC aligns with SDT principles, enabling employees to expand responsibilities, develop skills, and engage meaningfully (Bindl, et al., 2019), hence satisfying their psychological needs. PRE-O JC focuses on reducing or avoiding burdensome tasks, stabilizing the work environment, but may limit proactive engagement. Literature highlights JC's role in performance, yet its impact on PCSP and the mediating role of psychological need satisfaction, moderated by influence tactics, is underexamined.

Methodology

Data from 278 supervisor-employee dyads in the service sector using a two-wave, time-lagged design. All used scales were established in prior research. Structural equation assessed direct, mediating, and moderating effects (Sarstedt et al., 2021), while artificial neural network (ANN) analysis evaluated the relative importance of JC dimensions.

Key Findings

PLS-SEM results indicate that PRO-O JC positively affects PCSP (β=0.408, $p<0.01$), whereas PRE-O JC negatively affects PCSP (β=-0.148, $p<0.05$). Both JC types positively influence employee need satisfaction, which in turn mediates their effects on PCSP (β=0.135, $p<0.05$ and β=0.264, $p<0.05$). Collaboration strengthens the effects of PRO-O JC on need satisfaction but weakens the effects of PRE-O JC. Pressure tactics negatively moderate both relationships, undermining the positive effects of both types of JC on need satisfaction. ANN analysis ranked promotion-oriented cognitive and task crafting as the most influential predictors of PCSP, followed by prevention-oriented cognitive crafting, confirming SEM results. Overall, JC explained 56.7% of variance in need satisfaction and 38.5% in PCSP.

Limitations

Findings are based on dyadic data from a single service sector context, limiting generalizability.

Theoretical and Practical Implications

Theoretically, the study advances understanding of JC within SDT by demonstrating that need satisfaction mediates JC effects on proactive behaviors (Deci et al., 2017). Practically, managers

should encourage PRO-O JC to enhance PCSP, monitor PRE-O JC to prevent overly risk-averse behaviors, foster collaborative tactics, and minimize pressure-based interventions. Targeted training on cognitive and task-oriented crafting can further enhance employee proactivity, engagement, and customer service outcomes.

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THE IMPACT OF ARTIFICIAL INTELLIGENCE ON ENHANCING EMPLOYEE PRODUCTIVITY ACROSS DIVERSE CORPORATIONS

Kaufmann, Rudiger; Epaminonda, Epaminondas; Efthymiou, Leonidas; El Nemar, Abdul Hamid

School of Business, Department of Management, University of Nicosia, Nicosia, Cyprus

School of Business, Department of Management, University of Nicosia, Nicosia, Cyprus

School of Business, Department of Management, University of Nicosia, Nicosia, Cyprus

School of Business, Department of Management, University of Nicosia, Nicosia, Cyprus

Keywords: Artificial Intelligence, Human Resources, Employee Performance, AI-powered tools, AI-Powered HRM system, employee well-being, Technology Acceptance Model, Job Demands-Resources Model

Introduction

The dramatic launch of Artificial Intelligence has appeared as a new tool for changing the way employee's performance are being managed in the human resource management system; from the performance of different types of employees to the enhancement of their capabilities. To date, there is a lack of advanced research on the topic of AIs impact on employee performance, especially in Lebanon, and this subject remains under-researched (Vrontis et al., 2023; Yanamala et al., 2022).

Research Aim and Objectives

Aim of the study

The central research aim of this study is to explore to how will Artificial Intelligence enhance employee performance or capabilities in various categories of workplaces in Lebanon (what specific AI tools are directly responsible for enhancing employee performance, and what role does TAM and JDR have in improving their performance and well-being).

Research objectives

The direction of this research is set by the research objectives:

• To identify and examine from existing literature which specific AI-powered tools and technological systems impact employee performance outcomes.

• To identify which models affect employee's perception towards the adoption and implementation of AI-powered performance systems to improve their performance in the workplace and implement their tasks in much better way.

• To identify overall in what conditions does AI when implemented in the workplace will act as a job resource for employees versus in what conditions does it act as a job demand.

Literature Review and Theoretical Framework

The two main theoretical models that will be used in this study are: TAM and JD-R. The Technology Acceptance Model (TAM) is used to explain when employees accept or reject AI tools – based on the tool's usefulness, ease of use, and how much it's trusted for use (Choung et al., 2023; Mustofa et al., 2025; Salah & Ayyash, 2025). The second model which is the supporting framework JD-R (Job Demands and Resources) explains whether AI acts as a resource where it supports employees' skills like enhancing their cognitive abilities (Przegalinska et al., 2025; Olan el al., 2024), or it acts as a demand that consistently pressure employees with workload stress and may also lead to job displacement (Necula et al., 2024).

Methodology and Methods

This study adopts a mixed-methods exploratory sequential design (first qualitative, then quantitative) (Creswell & Clark, 2017). To collect data qualitatively about AI capabilities, this study will target HR managers and employees who directly engage with AI in the workplace, so 10 to 15 participants will be approximately interviewed from diverse sectors (e.g.,

technology, services, education) exposed to AI systems. Purposive and snowball techniques will be employed to provide rich data by targeting experienced managers whom dealt with AI. A survey will be implemented to collect data targeting 300 to 400 participants. 5-point Likert scale will be adopted to be used in the survey (measurement points will be scaled from Strongly Disagree to Strongly Agree).

Main Findings and Contribution

Main findings showing the new factor which is the perceived trust is being alongside usefulness and ease of use in the TAM model showing that it also plays a critical role in influencing employees to adopt AI technologies. For the contribution, a validated conceptual framework will be provided linking AI technologies adoption and its impact on employee well-being and performance in under-researched and weak economy like Lebanon.

Originality and Value

This research extends the original papers linked to my study by adding perceived trust as a new factor in the TAM model and linking the TAM and JD-R in the same conceptual framework. It will be first time to study the two models' relationship (TAM and JD-R) inside a constrained economy like Lebanon.

Research Limitations

The qualitative sample that will be collected may be small or limited since AI implementation inside Lebanon is partial. Limited research examines AI nuanced effects on employee performance within developing economies such as Lebanon.

Theoretical and Practical Implications

Theoretically, it extends existing theories of technology adoption and performance management systems (e.g., TAM, JD-R, and socio-technical systems) through an integrated, human-centered framework. Practically, the final framework serves as a diagnostic and planning tool for HR managers pursuing digital transformation while maintaining human-centric values.

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DEVELOPING PERFORMANCE QUALITY: A MODERATED MEDIATION MODEL

Islam, Md Asadul[1]; Almashayekhi, Abdullah[2]; Somu, Subbulakshmi[3]

[1&2]Department of Management and Marketing, KFUPM Business School, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia

[1&2]IRC for Finance and Digital Economy, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia

[3]St Joseph's Institute of Management, Bangalore, India

Keywords: Agentic AI drivers, Employee performance quality, Team reflexivity, Competitive intensity

Introduction

Agentic artificial intelligence (AI) is transforming how employees perform, collaborate, and make decisions across organisations. Rather than simply improving efficiency, organisations increasingly expect AI to support high-quality performance in dynamic and competitive environments. This shift requires a better understanding of the organisational conditions that enable successful human–AI collaboration (Huang et al., 2019; Raisch and Krakowski, 2021).

Purpose, Aim and Objectives

This study examines the direct effects of agentic AI drivers on employee performance quality, the mediating role of team reflexivity, and the moderating effect of competitive intensity.

Literature Review and Theoretical Framework

Existing research suggests that AI improves organisational outcomes by enhancing productivity, creativity, and decision-making (Verma et al., 2021; Kassa and Worku, 2025; Chandrasekera et al., 2025). However, limited research explains how agentic AI enhances employee performance quality through team reflexivity. Drawing on socio-technical systems and dynamic capabilities theories, this study argues that AI-enabled capabilities are more effective when supported by

collaborative team processes and organisational conditions (Schippers et al., 2015; Trist & Bamforth, 1951; Islam et al., 2026).

Methodology and Methods

This research partial least squares structural equation modelling (PLS-SEM) (Hair et al., 2012) was employed to analyse the data collected from 388 employees.

Findings and Contribution

The results show that technological, organisational, and environmental factors have a direct and positive influence on EPQ; however, human drivers do not indicate a direct impact. Moreover, TR is found to be an effective mediator in the relationships between organisational, environmental and human drivers. However, results show no mediation in the relationship between technology driver and EPQ. Moreover, competitive intensity was found to moderate the relationship between TR and EPQ.

Originality and Value

This study is among the first to explain how agentic AI drivers improve employee performance quality by integrating socio-technical systems and dynamic capabilities theories through team reflexivity and competitive intensity.

Research Limitations

This study uses cross-sectional data, which limits causal inference. The findings are also context-specific and may not be generalisable across industries or countries. Future studies should adopt longitudinal designs and validate the model in different organisational settings.

Theoretical and Practical Applications and Implications

This study extends socio-technical systems and dynamic capabilities theories by explaining how team reflexivity translates agentic AI drivers into employee performance quality. Practically, it encourages managers to complement AI adoption with collaborative team practices and supportive organisational environments to enhance high-quality employee performance under competitive conditions.

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BUILDING STRATEGIC AGILITY: A MULTIDIMENSIONAL FRAMEWORK FOR DEVELOPING ORGANIZATIONAL CAPABILITIES

Christofi, Kyriakos[1]; Eteokloeous, Pantelitsa[1]; Ellina, Polina[1] and Kythreotis, Alexios[1]
[1]PEAK Innovation Center, School of Business Administration and Digital Technologies, European University Cyprus, Nicosia, Cyprus

Keywords: Strategic Agility, Strategic Management, Knowledge Organization, Strategic Change

Introduction

Strategic agility has emerged as a critical organizational capability for sustaining competitive advantage in highly volatile and rapidly evolving business environments. It refers to an organization's ability to sense environmental changes and respond rapidly while maintaining strategic alignment and operational efficiency (Doz and Kosonen, 2008; Weber and Tarba, 2014). Existing literature acknowledges agility's importance in turbulent markets but often examines isolated elements, such as technological alignment or innovation capability, rather than adopting a holistic empirical perspective.

Purpose, Aim and Objectives

This study aims to develop a comprehensive best practice framework for cultivating strategic agility, supported by functional key performance indicators (KPIs). It integrates empirical findings from four leading publicly listed multinational corporations into a holistic model explaining how organizations develop strategic agility through leadership initiatives, cross-functional coordination, and continuous knowledge development.

Literature Review and Theoretical Framework

Addressing the gap left by prior studies' isolated treatment of agility, this research builds on earlier conceptual and empirical work to explore the interconnected mechanisms supporting strategic agility across organizational functions.

Methodology and Methods

The study adopts a qualitative multiple case study design examining four publicly listed multinational corporations recognized for adaptive capabilities within their industries. Data collection triangulated primary and secondary sources: in-depth semi-structured interviews with senior executives, and corporate annual reports spanning ten financial years. An expert panel of ten experienced strategy professionals and executives further validated the proposed framework, confirmed the operationalization of practices, and refined the suggested performance indicators.

Main Findings and Contribution

Organizations cultivate strategic agility through the systematic development and diffusion of knowledge assets that enable real-time sensing and response to environmental changes. Four strategic themes were identified as critical drivers: digitalization, open innovation, dynamic talent management, and corporate sustainability. These themes interact continuously across functions, strengthening adaptability and responsiveness. Strategic agility develops through four interactive stages. “Realization” involves recognizing environmental trends and strategic gaps. “Exploration” focuses on leadership-driven initiatives across key functions. “Maturation” involves integrating cross-functional practices such as open innovation partnerships, digital transformation, and talent development. “Capitalization” reflects the conversion of these capabilities into measurable financial outcomes, including profitability growth, market share expansion, and shareholder value. This development is iterative and non-linear: organizations frequently revisit earlier stages through feedback loops between market performance and internal practices, enabling continuous strategic renewal. The study also proposes KPIs spanning leadership investment in R&D, digital infrastructure, employee development, stakeholder engagement, innovation outputs, and sustainability performance, while emphasizing that ultimate success must be reflected in financial indicators such as ROI, market capitalization, and revenue growth (Denning, 2017, 2018).

Originality and Value

This research offers a comprehensive, empirically grounded, practitioner-oriented framework for cultivating strategic agility, integrating adaptive leadership, cross-functional practices, and performance metrics to guide organizations toward long-term competitiveness in high-velocity environments.

Research Limitations

The qualitative multiple case study design, based on four publicly listed multinational corporations, may limit the generalizability of findings to organizations of different size, sector, or ownership structure.

Theoretical and Practical Applications/Implications

The framework and KPIs offer practitioners a structured, stage-based approach to building strategic agility and linking it to financial performance. Theoretically, the study contributes a holistic perspective integrating leadership, cross-functional coordination, and knowledge development, addressing prior research that examined these elements in isolation.

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TRIPLE LEARNING ENVIRONMENTS (3EEE): A PALESTINIAN MODEL FOR BRIDGING ACADEMIA AND THE LABOR MARKET

Iter, Nuha[1]; Shahin, Ghassan[2]; Mešl, Maja[3]; Kaufmann, Hans Rüdiger[4]; Sanchez Bengoa, Dolores [4]

[1]Faculty of Arts and Educational Sciences, Palestine Technical University-Kadoorie, Tulkarm, Palestine.

[2]College of Administrative Sciences & Informatics, Palestine Polytechnic University, Hebron, Palestine.

[3]Faculty of Polymer Technology, Sl- 2380 Slovenj Gradec, Ozare 19, Slovenja.

[4]University of Applied Management Studies Mannheim, Oscar-Meixner-Strasse 4-6, 68163 Mannheim, Germany

Keywords*:* Flipped classroom, Triple learning environments, Palestinian higher education, war contexts.

Introduction

The aim is to extend the Higher Education Flipped Classroom Approach (FCA) differentiated by war and protracted-crisis contexts. An initial conceptualization is developed by secondary sources and an ethnographic empirical approach emphasizing three integrated learning environments, where courses are designed by three transdisciplinary experts. Four dimensions under crisis are synthesized. Practically, the gap between graduates' competences and job market requirements is closed by trendsetting methods and practices of learning in multi-learning environments (Iter *et al*., 2023).

Literature Review and Theoretical Framework

Traditionally, FCA was validated in stable, well-resourced environments. Its capacity to increase engagement, reallocate synchronous contact time toward higher-order learning tasks, and support self-paced acquisition of foundational content is confirmed (Bergmann & Sams, 2014; Divjak *et al*., 2022). However, gaps of FCA referring to student motivation (Zainuddin *et al*., 2019) and professorial FCA familiarity barriers (Shnai, 2017) still exist. Moreover, most applications of FCA in the past five years have occurred under conditions other than designed for: the COVID-19 pandemic, the war in the Ukraine, the destruction of higher-education infrastructure in Gaza after October 2023, and protracted crises affecting universities in Syria,

Sudan, and elsewhere. In these settings, standard FCA has been adopted mainly by institutional improvisation as a tool for educational continuity. Evidentially, it has worked better than purely synchronous online delivery (Educational Challenges, 2023), but it still carries structural limitations in war contexts.

In the Palestinian context, the mismatch between higher education and the labour market is a key problem, leading to inequalities in the workforce (Ayyash et al., 2019; Hammoudeh, 2020) and a lack of alignment between graduates' skills and employers' needs (Nakhleh & Hanini, 2022; IMF, 2023; Samara, 2025). Academic curricula are mostly theoretical neglecting practical competencies and industry acquaintance. Unemployment and underutilized labor rates have been increasing since 2020 and have doubled between Q3/2023 and Q4/2025 (PCBS(ND)-a; PCBS (ND)-b. PCBS (ND)-c).

Hence, a new model is called for to cover the following structural gaps:

- Better connecting academia to authentic professional application. The triple environment approach (Bernhardsson et al., 2019) lacks systematic model formulation and crisis-context testing.
- Lack of multi-institutional studies of FCA under sustained war conditions.
- Disciplinary narrowness: FCA effectiveness reported mostly for practical/technical content.
- Absence of tested institutional-resilience structures.
- Absence of a theoretical framework for FCA's in crisis contexts.

Towards the 4-Dimensions Framework

The development of the initial conceptualization is grounded in two theoretical strands:

Constructivism and socio-constructivism. FCA rests on the constructivist premise (Kaufmann et al., 2022) that learners actively construct knowledge through interaction mediated through social interaction within zones of proximal development (Anderson & Krathwohl, 2001).

Boundary crossing and boundary objects. Multi-environment and cross-institutional design are based on Star & Griesemer (1989), Star (2010), and Akkerman & Bakker (2011). Artefacts linking learning environments (pre-class videos, shared reflection documents or workplace tasks) function as boundary objects; cross-institutional collaborative course development - the Triple Experts Teams - depends on functioning boundary objects between partner institutions and stakeholders (i.e. Brisbey, Traylor and Salas, 2021).

A working framework has been developed against which the gap-closing claims will be empirically tested as following:

D1: Operational continuity-Asynchronous-first architecture allows content acquisition to continue in case of air raids, closures, movement restrictions. Synchronous time concentrates on more flexible high-value interaction.

D2: Pedagogical resilience-Self-directed learning, time management, and digital literacy are cultivated as structural consequences and function as coping resources, not only as learning outcomes.

D3: Equity and access-Content delivery separated from synchronous interaction integrates geographically distributed learners (on-campus, internally displaced, abroad, under restriction).

D4: Institutional resilience-Cross-institutional collaborative course development survives the disruption of any single institution.

Research Methodology

The 3EEE concept is based on a critical realist ontology. Qualitative research is currently being designed to validate the four-dimension framework. The 3EEE evaluation includes course evaluation worksheets, Moodle learning analytics and structured roundtables with four stakeholder groups. Semi-structured interviews with three samples of 8-12 people will be used to reach saturation:

Pilot course leaders and Triple Experts Teams - the implementing perspective. This group is authoritative on all four dimensions: questions relate to reasons for disruption, their effective absorptions, observed student self-direction, effectiveness of cross-institutional collaboration and instructor workload.

Participating students - the receiving perspective. This sample authoritatively evidences pedagogical resilience and equity-and-access.

Palestinian Ministry of Education and Higher Education - the systemic perspective. This sample is authoritative on system-level continuity, policy implications, and inter-institutional structures.

The respective perspectives are carefully matched to authoritative knowledge.

Data will be analyzed via Content Analysis and by the support of MaxQDa software.

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Agri-Food Production and Tourism Experience: The Role of Traditional Alcoholic Beverages in the Tourism Development of Chios, Greece

Doumi, Maria[1]; Linardos, Evangelos-Taxiarchis[2]; Stampelos, Xenofon[3, 1], Angelis-Dimakis, Dimitris[1];

[1]Department of Tourism Economics and Management, University of the Aegean, Chios, Greece

[2]Department of Financial and Management Engineering, University of the Aegean, Chios, Greece

[3, 1] School of Chemistry, Aristotle University of Thessaloniki, and Greece

Keywords: Agri-food Tourism, Beverage Tourism, Traditional Alcoholic Beverages, Authenticity, Experiential Value, Behavioural Intentions, Chios Island, Greece

Introduction

In recent decades, food and wine tourism have become an important field of study, as local gastronomy, agricultural production and cultural heritage create significant tourist experiences (Ellis et al., 2018; Everett & Slocum, 2013). Traditional alcoholic beverages constitute an important part of local agri-food systems, combining agricultural resources, traditional production techniques and cultural practices, aiding to the formation of the regional identity of the region.

Tourism experiences, such as tastings, distillery visits and themed tours, bring visitors into direct contact with local producers and production processes, improving economic development (Hall & Mitchell, 2008). Previous studies argue that local food and drinks have a vital role in differentiating tourist destinations and strengthening local identity, especially in areas that aim to develop sustainable tourism using local resources (Everett & Slocum, 2013).

In the field of agri-food tourism, wine tourism confirms that linking beverage production with tourist experiences creates economic benefits and improves the promotion of tourist destinations (Getz & Brown, 2006). More recent studies emphasise that perceived authenticity and experiential value are key determinants of tourist engagement and behavioural intentions in gastronomic and agri-tourism contexts (Dixit, 2022; Rickly et al., 2024; Luo, 2024;). In recent years, research has also been extended to other traditional alcoholic beverages, such as local liqueurs, which the literature considers fundamental elements of gastronomic and beverage tourism (Bruwer & Alant, 2009).

However, in spite of these developments, research on traditional alcoholic beverages beyond wine tourism remains limited, especially regarding how authenticity perceptions and experiential engagement influence visitor behaviour and the overall tourism experience (Yi, 2025; Candra et al., 2025).

Purpose, aim and objectives

Although the literature on food and wine tourism has expanded, research on traditional alcoholic beverage tourism and its relationship to value creation in the agri-food sector remains limited. Few empirical studies examine how visitors' perceptions of authenticity and experiential value influence the consumption and promotion of local alcoholic beverages particularly beyond wine tourism contexts (Bruwer and Alant, 2009; Dixit, 2022).

The present study attempts to fill this research gap by conducting primary research on visitors to the island of Chios. The purpose of this research is to investigate visitors' knowledge, perceptions and attitudes toward traditional alcoholic beverages, with particular emphasis on perceived authenticity, experiential value and visitor involvement, which have been identified as key determinants of tourist behaviour in recent studies (Rickly et al., 2023; Luo, 2024). Furthermore, it will examine how these factors influence the tourist experience and shape behavioural intentions, including purchase intention, recommendation and participation in agri-food activities (Yi, 2025; Candra et al., 2025; Bakr, 2025).

Literature Review and theoretical framework

Latest studies underline that gastronomic and agri-tourism experiences are strongly influenced by perceived authenticity, experiential value and visitor involvement, which shape tourists' attitudes and behavioural intentions, including purchase intention and word-of-mouth communication (Dixit, 2022; (Rickly et al., 2023; Luo, 2024). Perceived authenticity improves sentimental connection and trust, while experiential engagement through activities such as tastings and producer interaction increases perceived value and visitor satisfaction (Yi, 2025; Candra et al., 2025; Sigala, 2015).

Chios is an interesting research field because it produces important goods such as a mastic-based beverage, a unique natural product with a Protected Designation of Origin (PDO), as well as ouzo, traditional fig spirits and Chios' mandarin liqueur (Protected Geographical Indication products, PGI), reflecting local production know-how and regional cultural heritage (Doumi et al., 2025).

Although the products are very important for the local economy and cultural identity of the island, their use in the tourist experience has been very limited in comparison with other Mediterranean destinations. This paper examines how authenticity, perceived value and experiential involvement of visitors influence their attitudes towards local beverages, the intention to purchase and willingness to recommend, as indicated by recent studies that associate these constructs with tourist decision-making processes (Bakr, 2025).

In this context and based on the literature, the present study advances a circular conceptual framework (Figure 1), linking local agri-food capital, perceived authenticity, experiential value, visitor involvement, attitudes and behavioural intentions. More specifically, traditional alcoholic beverages are viewed as tangible and symbolic expressions of local heritage that activate perceptions of authenticity. These perceptions strengthen the experiential value of the tourist encounter and encourage deeper visitor involvement, which in turn shape favourable attitudes and behavioural intentions such as purchase, positive word-of-mouth and participation in agri-food activities. The framework further assumes that these outcomes contribute to destination differentiation and reinforce the perceived authenticity of the place, creating a dynamic value loop between local production and tourism development.

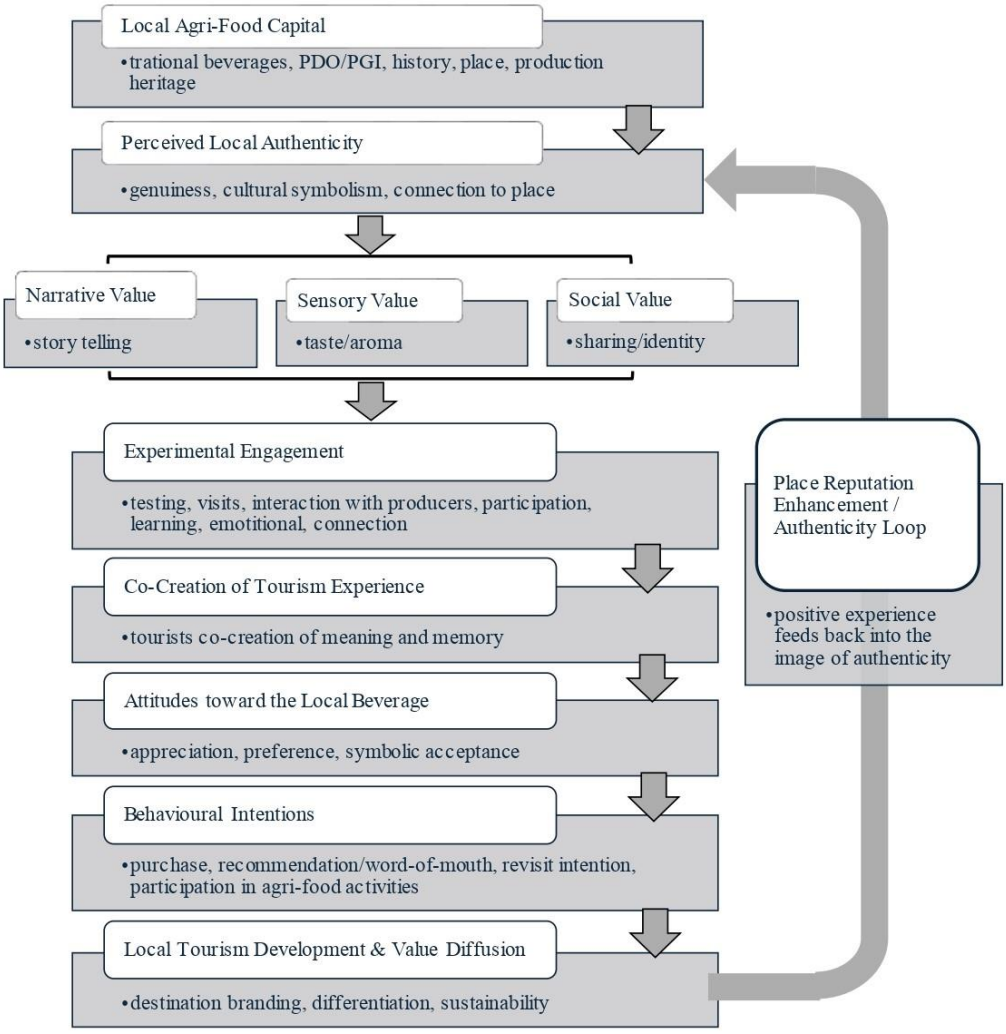


Figure 1: Theoretical Framework

of Traditional Alcoholic Beverages and Tourism Development

Methodology and Methods

A quantitative research design was employed, based on a conceptual model linking visitors' knowledge and experience, perceptions of authenticity and value, attitudes, and behavioural intentions. Data was collected through a structured questionnaire administered to visitors to the island of Chios during the November 2025-March 2026 tourism season.

The sample consisted of N = 691 respondents, selected through a non-probability convenience sampling approach, which is widely applied in tourism research involving

mobile populations (Veal, 2018). The use of structured questionnaires and Likert-scale measurements is consistent with recent empirical studies in tourism research (Dolnicar, 2019)

The questionnaire was based on established research frameworks and structured into four sections covering: (a) demographic characteristics, (b) knowledge and experience of local alcoholic beverages, (c) perceived authenticity and perceived value, and (d) attitudes and behavioural intentions. All perception-based variables were measured using five-point Likert scales. A pilot test was conducted to secure comprehensibility reliability and internal consistency of the instrument (Creswell, 2014).

The study adopted a combination of descriptive and inferential statistical methods for the analysis of data. First, exploratory techniques were applied for the description of the sample profile. Then, the research employed chi-square tests and ANOVA (analysis of variance) to investigate the relationships between the demographic groups (Field, 2018).

Exploratory factor analysis was used for understanding the construct validity and exploring the hidden structure of the measurement scales, as per well-documented methodologies (Hair et al., 2019). Moreover, multiple linear regression analysis was used to investigate the predictions of several independent variables on a single dependent variable. Using multivariate techniques is in line with the latest changes in tourism research methodologies (Hair, et al., 2019). Findings show that perceived authenticity and perceived value have a significant impact on behavioural intentions, but the cause effect relationship is still ambiguously established.

Main Findings and Contribution

The research results show that visitors express their approval and fondness of the traditional liquors of Chios to a very high degree and acknowledge them as the true depiction of the local culture and agricultural heritage. The decision to purchase depends on the perceived genuineness of the product, its expected value and the extent of which consumers have been exposed to and informed about it. These factors lead to a higher involvement in agri-food activities. These results indicate that experiential engagement and perceptions of authenticity have a central role in shaping visitors'

behavioural intentions, supporting recent theoretical perspectives in agri-food and gastronomic tourism.

The paper offers worldwide literature on agri-food tourism and entrepreneurship in the beverage sector by describing the importance of traditional alcoholic beverages for regional value creation and differentiation of tourist destinations. More specifically, the study extends existing research beyond wine tourism by demonstrating how non-wine traditional alcoholic beverages can boost destination identity and influence tourist behaviour through authenticity and experiential value mechanisms.

Originality and Value

The study contributes to the literature on agri-food tourism and entrepreneurship in the beverage sector by integrating the significance of traditional alcoholic beverages in regional value creation and destination differentiation. More specifically, the study expanse existing research beyond wine tourism by examining non-wine traditional alcoholic beverages and by linking perceived authenticity, experiential value and visitor involvement with behavioural intentions. The findings point up the importance of incorporating local beverage production into tourism experiences as a means of enhancing destination identity and encouraging sustainable development.

Moreover, research might expand this analysis to other destinations and apply comparative or longitudinal approaches to further explore the role of traditional beverages in different tourism contexts.

Research Limitations

Firstly, it focuses on one destination only, i.e. Chios, which may limit the extent to which the results can be applied to other places. Secondly, self-reporting by participants may lead to certain biases in the responses. Lastly, using mainly descriptive and inductive statistical methods means that we cannot firmly determine cause-effect relationships among variables.

Theoretical and Practical Implications

Theoretically, the results first and foremost emphasize the importance of perceived authenticity, experiential value and visitor involvement as the main factors that influence tourists' behaviour particularly in the agri-food and beverage tourism context.

Additionally, they constitute valuable addition to the body of knowledge, as it takes these ideas beyond wine tourism and implements them to traditional alcoholic beverages.

Practically, the findings imply that local stakeholders, like producers and destination managers, should direct their financial resources towards experiential tourism activities such as wine tastings, visits to distilleries, product storytelling, etc. These activities have the potential to both improve destination differentiation and develop knowledge-based agri-food value chains, which ultimately lead to innovation (Ferraris et al., 2017). Besides, incorporating local alcoholic drinks in tourism promotion can be an effective element of sustainable tourism development and hopefully, the case of small island destinations such as Chios will be a good example of it.

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ADOPTING THE BENEFIT CORPORATION MODEL IN AGRI-FOOD: EVIDENCE FROM ITALIAN CASE STUDIES

Borsellino, Valeria[1]; Mirabella, Claudio[1]; Galati, Antonino[1]; Calandra, Gabriele[1]; Schimmenti, Emanuele[1]

[1]Department of Agricultural, Food and Forestry Sciences, Università degli Studi di Palermo, Italy

Keywords: Benefit Corporation, Corporate Social Responsibility, Strategic Management, Sustainability, Corporate Governance, Agri-Food, Italy

Introduction

Mediterranean agri-food firms face climate volatility and structural fragility (Pulighe et al., 2024), and are increasingly expected to pursue goals beyond profit (Porter and Kramer, 2011). Italy introduced the Benefit Corporation (Società Benefit) through Law 208/2015. Adoption is voluntary; firms that opt in must write one or more common-benefit purposes into their by-laws, appoint an impact manager and publish an annual impact report assessed against an external standard, with failure sanctionable under consumer-protection law. Termed variously Benefit Corporation, Company or Firm, it is here called the former, and is distinct from the privately issued B Corp certification. Uptake has reached roughly 5,700 firms (Osservatorio sulle Società Benefit, 2026), yet the agri-food sector remains under-represented.

Purpose, Aim and Objectives

The study asks what adopters obtain from the status, and whether it is strategically sustainable in the medium to long term.

Literature Review and Theoretical Framework

The analysis draws on stakeholder theory and shared value. Empirical work on Italian Benefit Corporations is thin and sector-agnostic (Mion and Loza Adaui, 2020); evidence from peripheral territories is lacking.

Methodology and Methods

A convergent mixed-method design is nested within a multiple-case study (Yin, 2018). The strands answer separate questions and merge only at interpretation. Semi-structured interviews with managers of three Sicilian agri-food Benefit Corporations, plus corporate documents and

impact reports, establish how and why the status was adopted. Financial statements (2015-2024) trace performance afterwards. Interview accounts of investment programmes and transition costs are then used to read the direction and timing of those trajectories. The cases contrast deliberately in size, production system and conversion year: a family wine estate, a dried-fruit processor and an avocado scale-up.

Findings and Contribution

Adoption formalises a sustainability culture already present rather than creating one; in the wine estate the impetus was internal and family-borne, in the processor it was reinforced by a parallel B Corp path. Conversion strengthened governance: impact reporting, ESG integration in decision-making and structured stakeholder engagement extended across production, supply chain, human resources and communication. Financial outcomes track maturity rather than the status. The wine estate, converted in 2023 and already highly leveraged, recorded losses and negative ROE in 2023-2024, reflecting transition investment and pre-existing structural fragility. The processor, converted in 2017, returned ROE above 27% across the following triennium and deleveraged steadily (debt/equity from 2.27 to 0.84), yet slipped into loss from 2022 under post-pandemic costs. The scale-up, converted in 2024, posts negative EBITDA and ROE of −17%, consistent with its stage. All three read transition costs as strategic investment, not burden; the status nevertheless repays only firms whose balance sheet can absorb them.

Research Limitations

With three cases differing in size, age and conversion year, performance differences cannot be attributed causally to the status: they are confounded with life-cycle stage. The 2015-2024 window spans the pandemic and the shocks of 2022-2023, so trajectories reflect sector-wide disturbance interacting with firm-specific effects. Being an Italian legal institution, the model does not transfer across jurisdictions without attention to cross-cultural governance norms. Only one post-conversion financial year is available for the most recent case, so its trajectory is indicative rather than interpretable. The design cannot identify the determinants of adoption; a survey against a matched control group, supporting discrete-choice estimation, is the next step.

Theoretical and Practical Implications

The status is a governance instrument, not a turnaround device. Low agri-food uptake plausibly reflects the reporting burden, the absence of a dedicated tax incentive in Italy, and quality certifications already carrying the sustainability signal in these chains.

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FROM GLASS TO CAN: INSIGHTS INTO ITALIAN WINE CONSUMPTION TRENDS

Galati, Antonino[1], Bilardello Giorgia [1], Mirabella Claudio[1], Biondo Adriano[1], Botta Luigi [2]

[1] Department of Agricultural, Food and Forest Sciences, University of Palermo, Palermo, Italy

[2] Department of Engineering, University of Palermo, Palermo, Italy

Keywords: Wine business, wine marketing, Sustainable consumption, Responsible consumption, Innovative packaging

Introduction

In the wine sector, packaging is no longer just a container but a strategic tool that conveys value, shapes consumer perceptions, and leverages materials, design, and sustainability to compete in a global, innovation-driven market. In this context, aluminum cans for wine emerge as a response to these new industry challenges. Compared to traditional glass bottles, cans offer significant economic and environmental benefits. Their lighter weight reduces transport costs, energy use, and CO_2 emissions, while greater durability limits breakage losses (Ferrara and De Feo, 2023). Aluminum's high recyclability aligns with circular economy principles (Versari et al., 2020). Despite these advantages, cultural resistance persists, especially among experienced consumers who associate wine with glass, cork, and traditional rituals (Ferrara et al., 2021). Additionally, some concerns remain regarding the preservation of wine characteristics in cans, although advances in internal coatings have addressed corrosion and metal, wine interactions, maintaining sensory quality and making cans ideal for young, sparkling wines suited to casual, immediate consumption.

The canned wine trend is attracting growing academic interest, though findings are mixed. Canuti et al. (2025) show strong openness among Italians, especially younger consumers, who favor informal, outdoor consumption of light, low-alcohol wines, making cans well suited to emerging trends. Conversely, Orlowski et al. (2022) find that non-traditional packaging like aluminum cans lowers purchase intention by reducing product appeal and taste perceptions, with effects weaker for consumers seeking unique products but stronger with eco-friendly labels. Consistent with this, Sáenz-Navajas et al. (2025) report that cans reduce perceived quality especially for red wine but not white, except among highly involved consumers, and that canned wines are seen as more metallic and less fruity, highlighting the role of expectations, desire for uniqueness, and "image mold" in shaping

perception. In light of the above, this study examined Italian consumers' attitudes, behaviors, and demographics regarding canned wine, aiming to support market segmentation and estimate Willingness To Pay (WTP), with a focus on innovation, sustainability, and usage context.

Methodology and Methods

The survey was conducted anonymously using a purpose-designed questionnaire. A total of 492 individuals participated, but only 416 completed the survey and confirmed they were wine consumers. The questionnaire collected information on consumer attitudes, behaviors, and sociodemographic characteristics related to wine consumption. The resulting data were analyzed using a cluster analysis approach, enabling market segmentation and identification of distinct consumer profiles for further insights.

Findings and Contribution

The results highlight Italian wine consumption as mostly regular, mainly in social settings. Glass bottles dominate (88.8%), but 53.4% of consumers are open to alternative packaging if assured of quality and environmental benefits. Awareness of canned wine is low (18.3%), yet younger, educated consumers show greater interest, valuing convenience and sustainability. Price is important, with €3.50 considered acceptable by 43.3% of respondents. Overall, while glass remains preferred, there is growing potential for cans, particularly if quality, sustainability, and pricing are clearly communicated.

While glass remains dominant, aluminum cans show growing potential, especially among younger, educated consumers who value convenience, sustainability, and informal consumption. Adoption depends on perceived quality, environmental benefits, and competitive pricing. Theoretically, the study highlights how packaging shapes perceptions, expectations, and willingness to pay. Practically, wine producers can use cans to diversify products, target younger consumers, and communicate quality and sustainability to overcome cultural resistance.

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FROM POLICY TO THE TRIPLE BOTTOM LINE: DIGITAL TRANSFORMATION AND INNOVATION PERFORMANCE AS DRIVERS OF SUSTAINABLE PERFORMANCE IN SMALL AND MEDIUM-SIZED ENTERPRISES

Tran, Trang Thuy[1]

[1]International University, Vietnam National University-HCMC, Ho Chi Minh City, Vietnam

Keywords: Government policies, Digital transformation, Innovation performance, Green technology innovation, Sustainable performance, SMEs, PLS-SEM.

Abstract

Purpose. This study examines how government policies shape the sustainable performance of small and medium-sized enterprises (SMEs) through three internal mechanisms, namely digital transformation, innovation performance and green technology innovation. Grounded in institutional theory, the dynamic capabilities view and the natural-resource-based view, the paper models sustainable performance as a higher-order construct comprising economic, environmental and social dimensions. Design/methodology/approach. A cross-sectional survey collected 318 usable responses from managerial respondents in manufacturing and trade-and-service SMEs in Vietnam, an emerging economy. The measurement and structural models were assessed using partial least squares structural equation modelling (PLS-SEM) with 5,000 bootstrap resamples, and the higher-order construct was estimated using the repeated indicators approach. Findings. Government policies strongly predicted digital transformation and, in turn, digital transformation predicted innovation performance, which advanced sustainable performance and green technology innovation. Digital transformation and innovation performance emerged as the strongest internal levers, whereas the effect of green technology innovation on sustainable performance, though significant, was small.

Introduction

Small and medium-sized enterprises (SMEs) sit at the centre of the sustainability transition. This tension is acute in emerging economies such as Vietnam, where firms combine limited financial slack and thin managerial bandwidth with rising exposure to environmental regulation, rapid digitalisation and international market requirements (Mai et al., 2024; Sohu et al., 2024).

Government policies are widely regarded as a primary external stimulus for greening and digitising business activity. Incentives, regulatory monitoring, digital-infrastructure programs and sustainability-oriented national strategies can lower the cost and raise the payoff of adopting digital technologies and

cleaner production methods (Mai et al., 2024; Jiang, 2025). Yet the mechanisms through which policy translates into performance remain underspecified.

A parallel literature emphasises internal capability. Digital transformation, the strategic adoption of digital technologies that reconfigures business models, operations and value creation, is increasingly treated as a foundational capability that enables firms to innovate and to pursue long-term, sustainable growth (Verhoef et al., 2021; Zada et al., 2025; Martínez-Falcó et al., 2024). Digital transformation is argued to enhance innovation performance, the firm's ability to convert innovation efforts into superior products, services and market outcomes (Paovangsa et al., 2025), which in turn supports green technology innovation and broader sustainable performance (Sahoo et al., 2023; Wang et al., 2022). Despite the intuitive appeal of an integrated chain running from external policy through digital transformation and innovation to performance, several gaps persist. First, most evidence anchors digital transformation to a single environmental or financial outcome, and the relative strength of the direct policy effect versus the digitalisation-and-innovation channels is rarely quantified in one model (Akhtar et al., 2024). Second, sustainable performance is often collapsed into a single measure, obscuring whether policy and capability advance the economic, environmental and social pillars evenly. Third, findings on the innovation-to-green-technology link are mixed, with some studies reporting weak effects, which motivates a careful test in a new institutional setting (Shehzad et al., 2024).

This study addresses these gaps by modelling government policies, digital transformation, innovation performance and green technology innovation as antecedents of a higher-order sustainable-performance construct that captures the economic, environmental and social dimensions of the triple bottom line (Hossain et al., 2024). We test the model on 318 SMEs in Vietnam using partial least squares structural equation modelling (PLS-SEM), a method suited to complex models, higher-order constructs and prediction-oriented objectives (Hair et al., 2022; Dash and Paul, 2021).

The empirical setting of this study, Vietnam, sharpens the relevance of these questions. The government has made digital transformation and sustainable development explicit national priorities, embedding them in strategies, incentive schemes and infrastructure programmes that directly target smaller firms (Mai et al., 2024). This configuration, in which an active policy agenda meets a large population of resource-constrained firms, provides a strong test of whether and how an external institutional stimulus is converted into internal capability and, ultimately, into triple-bottom-line performance.

By bringing government policies, digital transformation, innovation performance and green technology innovation into a single structural model, the study responds to repeated calls to move

beyond isolated dyadic relationships and to specify the sequence through which policy and capability jointly shape sustainability (Verhoef et al., 2021; Xu et al., 2023).

Literature Review

Theoretical framework

Explaining how an external policy stimulus is transformed into sustainable performance in resource-constrained SMEs requires more than a single theoretical lens. The present study therefore integrates institutional theory, the dynamic capabilities view and the natural-resource-based view (NRBV) into a single institution-to-capability-to-performance framework.

Institutional theory holds that organisations are embedded in fields whose regulative, normative and cultural-cognitive expectations define what counts as legitimate behaviour (DiMaggio and Powell, 1983). Government policy is the archetypal coercive mechanism (Jiang, 2025).

Whereas institutional theory explains the external impetus to act, the dynamic capabilities view explains the internal capacity to respond. Teece, Pisano and Shuen (1997) define dynamic capabilities as a firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments, a capacity later specified as the identifiable organisational and strategic routines of sensing, seizing and reconfiguring (Eisenhardt and Martin, 2000). Digital transformation is increasingly theorised as precisely such a higher-order dynamic capability.

The dynamic capabilities view specifies how firms reconfigure resources but is largely silent on the environmental content and competitive payoff of those reconfigurations, which is where the natural-resource-based view enters. Extending the resource-based view (Barney, 1991), Hart (1995) argues that strategies of pollution prevention, product stewardship and clean technology generate capabilities that are simultaneously environmentally beneficial and competitively valuable. The NRBV consequently explains why digital and innovation capabilities that are channelled toward cleaner processes and products should raise not only environmental performance but also economic and social performance, that is, the full triple bottom line (Aftab et al., 2022; Hossain et al., 2024; Marzouk and El Ebrashi, 2024).

Hypotheses development

Government policies, digital transformation, innovation and sustainable performance

Government policies denote the regulations, incentives, monitoring mechanisms, digital-infrastructure programmes and strategic orientations through which the state structures the environment in which firms operate (Mai et al., 2024). Because SMEs are resource-constrained and highly exposed to their

institutional environment, policy is expected to shape their behaviour both directly, by altering incentives and legitimacy, and indirectly, by prompting capability building.

Government policies can improve sustainable performance directly along all three pillars. Fiscal incentives, credit access and public procurement improve economic outcomes; environmental regulation and monitoring compel emission and waste reductions that improve environmental outcomes; and sustainability-oriented mandates encourage labour, safety and community practices that improve social outcomes (Hart, 1995; Truong et al., 2025). Accordingly: *H1. Government policies positively influence sustainable performance.*

Policy also stimulates green technology innovation. Environmental standards, eco-labelling requirements and green-technology subsidies raise the expected return on cleaner processes and eco-designed products while penalising polluting methods, prompting firms to sense and seize green technological opportunities (Teece et al., 1997; Akhtar et al., 2024; Wu et al., 2024). Accordingly: *H2. Government policies positively influence green technology innovation.*

Beyond environmental technology specifically, policy strengthens firms' broader innovation performance. Innovation grants, research and development tax relief, technology-transfer programmes and digital-infrastructure investment lower the cost and uncertainty of experimentation, enabling SMEs to convert innovation efforts into superior products, services and market outcomes (Mai et al., 2024; Paovangsa et al., 2025). Accordingly: *H3. Government policies positively influence innovation performance.*

Most directly of all, government policy drives digital transformation. National digitalisation programmes, broadband and platform infrastructure, e-government services and digital-adoption incentives reduce the fixed cost and perceived risk of adopting digital technologies, which is often prohibitive for smaller firms (Mai et al., 2024; Verhoef et al., 2021; Vial, 2019). Because digital transformation is capital- and capability-intensive, the external stimulus is expected to be strongest for this relationship. Accordingly: *H4. Government policies positively influence digital transformation.*

Digital transformation, innovation performance and sustainable performance

Digital transformation is the strategic process through which organisations redefine their business models, operations and value propositions by embedding advanced digital technologies such as cloud computing, data analytics, artificial intelligence and connected platforms (Vial, 2019; Verhoef et al., 2021; Martínez-Falcó et al., 2024).

Digital transformation advances sustainable performance through several mechanisms. Digitally enabled process optimisation reduces energy and material consumption and lowers emissions, improving the environmental pillar; automation, data-driven decision making and new digital revenue

streams raise productivity and financial performance, improving the economic pillar; and greater transparency, traceability and stakeholder engagement strengthen social outcomes (Xu et al., 2023; Zada et al., 2025). Accordingly: *H5. Digital transformation positively influences sustainable performance.*

Digital transformation is also a powerful antecedent of innovation performance. By expanding access to data, accelerating knowledge flows, enabling rapid prototyping and lowering the cost of experimentation, digital capabilities increase the speed, quality and market responsiveness of the innovation process (Warner and Wäger, 2019; Paovangsa et al., 2025). Accordingly: *H6. Digital transformation positively influences innovation performance.*

Innovation performance, green technology innovation and sustainable performance

Innovation performance reflects a firm's realised ability to convert innovation efforts into superior products and services, technological competitiveness and speed to market (Paovangsa et al., 2025). It captures the effectiveness of the seizing-and-reconfiguring process emphasised by the dynamic capabilities view (Teece et al., 1997; Eisenhardt and Martin, 2000).

A demonstrated capacity to innovate provides the cognitive, technical and organisational base from which environmentally oriented technological change is developed. Firms that consistently commercialise new products accumulate research and development routines, absorptive capacity and market knowledge that can be redirected toward cleaner processes and eco-design (Teece et al., 1997; Sahoo et al., 2023). Although the direction from general to green innovation is theoretically defensible, prior evidence on innovation-to-green links is mixed, which warrants direct testing (Shehzad et al., 2024). Accordingly: *H7. Innovation performance positively influences green technology innovation.*

Innovation performance also lifts sustainable performance directly. Superior innovation outcomes improve cost efficiency and productivity, enabling the economic pillar; they support resource-saving and less polluting offerings, advancing the environmental pillar; and they create value for employees and communities through better products and processes, strengthening the social pillar, so that innovation performance advances the triple bottom line as a whole (Aftab et al., 2022; Hossain et al., 2024; Marzouk and El Ebrashi, 2024). Accordingly: *H8. Innovation performance positively influences sustainable performance.*

Green technology innovation and sustainable performance

Green technology innovation refers to the development and adoption of cleaner production methods, eco-designed products, recycling and recovery practices and environmentally oriented process improvements (Sahoo et al., 2023; Wang et al., 2022). Consistent with the NRBV, clean-technology

and pollution-prevention capabilities are valuable, rare and hard to imitate, and therefore generate advantage while improving environmental outcomes; the accompanying efficiency gains and access to green markets extend the benefit to economic and social performance (Hart, 1995; Hart and Dowell, 2011; Shahzad et al., 2020). Because green technology innovation is a specialised, downstream capability whose returns depend on complementary digital and innovation assets, however, its independent effect may be more modest than that of those broader capabilities. Accordingly: *H9. Green technology innovation positively influences sustainable performance.*

Conceptual framework

Figure 1 presents the conceptual model. Sustainable performance is specified as a higher-order construct reflected by its economic, environmental and social dimensions.

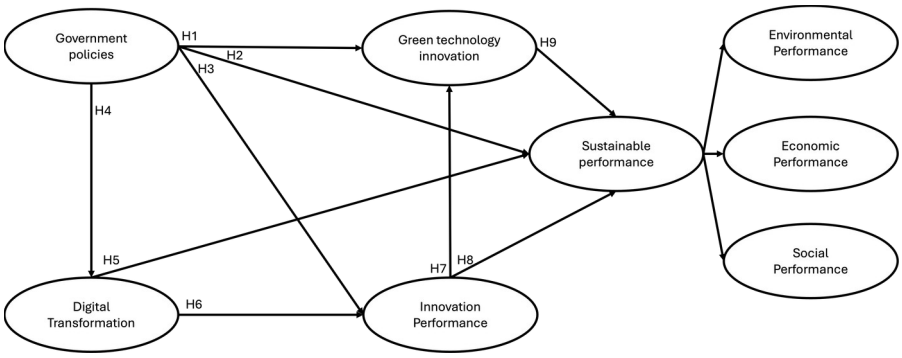


Figure 1: Conceptual model

Methodology

Population and sample

The target population comprised managerial-level respondents in SMEs operating in the southern key economic zones of Vietnam, an emerging economy, spanning manufacturing and processing technology as well as trade and services. Data were collected through a structured, close-ended online questionnaire administered in Vietnamese to a single knowledgeable respondent per firm, typically a middle manager, department director, senior specialist or owner-manager, who was positioned to report on the firm's policy environment, digital and innovation activities and performance. The final sample of 318 exceeds the threshold that Comrey and Lee (2013) classify as very good for latent-variable analysis. To limit method bias procedurally, respondents were assured of anonymity, items were presented in a neutral order and the questionnaire avoided leading wording.

The sampling frame was compiled from directories of registered SMEs operating in manufacturing and processing technology and in trade and services. A purposive procedure was used to reach informants who held managerial responsibility and could credibly report on the firm's policy environment, digital initiatives, innovation activities and performance. Before full deployment, the instrument was pretested with 50 respondents in order to assess its clarity, relevance and item comprehension. Of the

500 questionnaires distributed online, 420 were returned, a return rate of 84.0%. The returned questionnaires were then screened for completeness, internally inconsistent responding and compliance with the screening criteria, and 318 cases were retained for the final analysis, yielding an effective response rate of 63.6%.

Table 1 summarises the sample. Trade-and-service firms made up 62.9% of the sample and manufacturing firms 37.1%. Most firms were small, with 78.6% employing fewer than 50 people.

Category	Frequency	%
Industry sector		
Trade and services	200	62.9
Manufacturing / processing technology	118	37.1
Firm size		
Fewer than 50 employees	250	78.6
From 51 to 200 employees	38	11.9
More than 200 employees	30	9.4
Respondent position		
Middle manager	208	65.4
Department director	44	13.8
Owner / CEO / managing director	39	12.3
Senior specialist / coordinator	27	8.5
Gender		
Female	181	56.9
Male	132	41.5
Other / prefer not to say	5	1.6
Education		
College / university	283	89.0
Postgraduate	30	9.4
Prefer not to say	5	1.6

Table 1: Respondent and firm profile (N = 318)

Measures

All constructs were measured with multi-item, seven-point Likert scales adapted from validated sources and refined for the study context. Government policies were measured with five items adapted from Mai et al. (2024). Digital transformation was measured with five items adapted from Martínez-Falcó et al. (2024). Innovation performance was measured with three items adapted from Paovangsa et al. (2025). Green technology innovation was measured with five items adapted from Sahoo et al. (2023). Sustainable performance was measured as a higher-order construct with nine items adapted from Hossain et al. (2024), organised into three first-order dimensions, namely economic performance, environmental performance and social performance (three items each).

All items were adapted from previously validated English-language scales, translated into Vietnamese and independently back-translated to preserve conceptual equivalence. Minor wording adjustments ensured that each item referred concretely to the respondent's own firm. All constructs were specified reflectively at the first-order level, and sustainable performance was modelled as a reflective-reflective (Type I) higher-order construct, that is, a construct reflected by its economic, environmental and social

dimensions. This specification follows the conceptual logic of the triple bottom line, in which the three pillars are interchangeable manifestations of a single underlying sustainability orientation rather than distinct components that jointly form it (Sarstedt et al., 2019; Hossain et al., 2024). The full measurement items are available from the author upon request.

Statistical techniques

The model was estimated using partial least squares structural equation modelling (PLS-SEM) in SmartPLS 4. Sustainable performance was specified as a reflective-reflective (Type I) higher-order construct and estimated with the repeated indicators approach. Consistent with this specification, the relationships between the higher-order construct and its three dimensions are reported as loadings, and the higher-order construct is evaluated with the reflective criteria of indicator reliability, internal consistency and convergent validity rather than with the weights and variance inflation factors that a formative specification would require (Sarstedt et al., 2019; Hair et al., 2022). Significance was assessed with bootstrapping using 5,000 resamples. The measurement model was evaluated for indicator reliability, internal consistency, convergent validity and discriminant validity; the structural model was evaluated for collinearity, path significance, explanatory power and predictive relevance (Hair et al., 2022; Henseler et al., 2015).

For the structural model, collinearity was checked through inner variance inflation factors, path significance through 5,000-resample bootstrapping, explanatory power through the coefficient of determination and out-of-sample prediction through the PLSpredict Q^2 statistic, while overall fit was gauged with the standardised root mean square residual. Common method bias was examined ex post through the full collinearity approach (Kock, 2015). Effect sizes were interpreted with Cohen's f^2 benchmarks of 0.02, 0.15 and 0.35 for small, medium and large effects, and the precision of each estimate was reported through bias-corrected 95% bootstrap confidence intervals (Hair et al., 2022).

Results

Common method bias

Because all constructs were measured using a single self-reported questionnaire, the potential for common method bias (CMB) was assessed using the full collinearity approach proposed by Kock (2015), with full collinearity variance inflation factors (FCVIFs) below the 3.3 threshold indicating that the model is free from common method bias. As reported in Table 2, all FCVIF values ranged from 1.070 to 2.067, well below the recommended cut-off.

Measurement model reliability and validity

Sustainable performance was modelled as a higher-order construct; following Sarstedt et al. (2019), its measurement quality was assessed at the level of its first-order dimensions. As shown in Table 2, all

retained item loadings met or were close to the 0.70 threshold, supporting indicator reliability. Cronbach's α values ranged from 0.830 to 0.927 and composite reliability (CR) from 0.898 to 0.945, all above the 0.70 benchmark, confirming internal consistency. Convergent validity was supported, as the average variance extracted (AVE) of every first-order construct exceeded 0.50 (ranging from 0.659 to 0.790) (Hair et al., 2022). At the second-order level, sustainable performance was reflected in near-equal proportion by its three dimensions, with loadings of 0.900 for economic performance, 0.907 for environmental performance and 0.908 for social performance.

Constructs	Items	Loadings	Cronbach's α	CR	AVE	FCVIF
Sustainable performance						
Economic performance (EcP)	EcP1–EcP3	0.877–0.903	0.867	0.918	0.790	1.070
Environmental performance (EnP)	EnP1–EnP3	0.843–0.891	0.830	0.898	0.747	2.067
Social performance (SoP)	SoP1–SoP3	0.863–0.881	0.843	0.905	0.761	1.234
Government policies (GP)	GP1–GP5	0.788–0.848	0.877	0.911	0.671	1.855
Digital transformation (DT)	DT1–DT5	0.844–0.891	0.927	0.945	0.774	2.047
Innovation performance (IP)	INN1–INN3	0.862–0.883	0.847	0.907	0.766	1.098
Green technology innovation (GTI)	GTI1–GTI5	0.798–0.836	0.871	0.906	0.659	1.177

Table 2: Validity and reliability test results

Discriminant validity was assessed using the heterotrait–monotrait (HTMT) ratio and the Fornell–Larcker criterion at the level of the first-order constructs. As shown in Table 3, all HTMT values were below the 0.90 threshold and the square root of each construct's AVE exceeded its correlations with all other constructs, confirming adequate discriminant validity (Fornell and Larcker, 1981; Henseler et al., 2015; Hair et al., 2022). The comparatively higher HTMT values among the economic, environmental and social dimensions are expected, because these are first-order components of the same higher-order sustainable-performance construct rather than conceptually distinct constructs. The higher-order construct (Sustainable performance) is excluded from this table, as the heterotrait–monotrait comparison between a higher-order construct and its own first-order dimensions is not meaningful.

	DT	EcP	EnP	GP	GTI	IP	SoP
Heterotrait–monotrait ratio (HTMT)							
DT							

EcP	0.740					
EnP	0.774	0.852				
GP	0.785	0.765	0.814			
GTI	0.368	0.496	0.427	0.440		
IP	0.811	0.740	0.807	0.807	0.412	
SoP	0.814	0.837	0.890	0.843	0.376	0.858

Table 3: Discriminant validity results

Structural model and hypothesis testing

After confirming the measurement model, the structural model was assessed using a bootstrapping procedure with 5,000 resamples (Hair et al., 2022). Collinearity among predictor constructs was within acceptable limits, with all inner-model VIF values below the conservative threshold of 3.3. The coefficient of determination (R^2) was 0.725 for Sustainable performance; 0.587 for Innovation Performance; 0.503 for Digital Transformation; 0.166 for Green Technology Innovation. The standardised root mean square residual (SRMR) was 0.070, indicating an acceptable fit for a complex PLS–SEM model. Predictive relevance was confirmed through PLSpredict, as all endogenous constructs returned positive Q^2predict values (ranging from 0.139 to 0.589), supporting the model's out-of-sample predictive capability.

Table 4 reports the path coefficients (β), t-values, p-values, bias-corrected 95% confidence intervals, effect sizes (f^2) and outcomes for each hypothesised relationship. Hypotheses with $p \leq 0.05$ were supported.

	Relationships	**β**	**t-value**	**p-value**	**95% CI [LL, UL]**	**f^2**
H1	GP → SP	0.335	5.118	0.000	[0.217, 0.471]	0.168
H2	GP → GTI	0.267	3.131	0.002	[0.096, 0.428]	0.044
H3	GP → IP	0.374	5.889	0.000	[0.250, 0.495]	0.168
H4	GP → DT	0.709	21.402	0.000	[0.635, 0.768]	1.012
H5	DT → SP	0.299	5.409	0.000	[0.189, 0.404]	0.130
H6	DT → IP	0.454	7.207	0.000	[0.328, 0.572]	0.248
H7	IP → GTI	0.174	2.316	0.021	[0.027, 0.320]	0.019
H8	IP → SP	0.269	5.339	0.000	[0.167, 0.364]	0.108
H9	GTI → SP	0.091	2.419	0.016	[0.022, 0.169]	0.025

Table 4: Results of hypothesis testing

Note. β = standardised path coefficient. t-values and p-values are based on 5,000 bootstrap resamples with two-tailed testing. Confidence intervals are bias-corrected bootstrap intervals at the 2.5th and 97.5th percentiles.

As Table 4 shows, government policies exerted the strongest effect in the model on digital transformation ($\beta = 0.709$, $p < 0.001$) and significant effects on innovation performance ($\beta = 0.374$, $p < 0.001$), sustainable performance ($\beta = 0.335$, $p < 0.001$) and green technology innovation ($\beta = 0.267$, $p = 0.002$), supporting H4, H3, H1 and H2. All nine hypotheses were therefore supported, although the effect of green technology innovation was markedly smaller than the policy and digital-transformation effects. The effect sizes reinforce this ordering. Government policies produced a very large effect on digital transformation ($f^2 = 1.012$) and medium effects on innovation performance and sustainable performance ($f^2 = 0.168$ in both cases), while digital transformation produced a medium effect on innovation performance ($f^2 = 0.248$) and a small-to-medium effect on sustainable performance ($f^2 =$

0.130). By contrast, the effects of government policies on green technology innovation ($f^2 = 0.044$), of green technology innovation on sustainable performance ($f^2 = 0.025$) and of innovation performance on green technology innovation ($f^2 = 0.019$) were small or negligible, so that the green-technology paths are statistically significant but substantively minor.

Mediating effects

Mediation was examined through the specific indirect effects generated by the bootstrapping procedure and classified following the guidelines of Zhao et al. (2010). As Table 5 shows, three of the five examined indirect paths toward sustainable performance were statistically significant ($p < 0.05$), confirming that digital transformation and innovation performance transmit the effect of government policies onto sustainable performance, and that innovation performance channels the effect of digital transformation. Because the corresponding direct effects were also significant and of the same sign, these three cases represent complementary (partial) mediation in the terms of Zhao et al. (2010). The two indirect paths running through green technology innovation (GP → GTI → SP and IP → GTI → SP) were not significant ($p > 0.05$); since their direct counterparts remain significant, they represent direct-only non-mediation, indicating that the green-technology-innovation channel is weak in this setting.

Indirect path	β	p-value	Type of mediation (Zhao et al., 2010)
GP → DT → SP	0.212	0.000	Complementary (partial) mediation
GP → IP → SP	0.101	0.000	Complementary (partial) mediation
GP → GTI → SP	0.024	0.074	Direct-only non-mediation
DT → IP → SP	0.122	0.000	Complementary (partial) mediation
IP → GTI → SP	0.016	0.130	Direct-only non-mediation

Table 5: Mediating effects and type of mediation

Discussion

All nine hypothesised direct relationships were supported, but their magnitudes differ in ways that are theoretically informative.

The results position government policies as the most consequential antecedent in the model. Policy exerted an exceptionally strong effect on digital transformation (H4, beta = 0.709), a strong effect on innovation performance (H3, beta = 0.374), a significant direct effect on sustainable performance (H1, beta = 0.335) and a moderate effect on green technology innovation (H2, beta = 0.267).

Digital transformation emerged as the pivotal internal capability. It strongly predicted innovation performance (H6, beta = 0.454) and significantly improved sustainable performance directly (H5, beta = 0.299). Digital transformation carried the effect of government policies onward to sustainable performance as a single mediator (GP → DT → SP, beta = 0.212), and innovation performance in turn

transmitted the effect of digital transformation onto sustainable performance (DT → IP → SP, beta = 0.122). Digital transformation is therefore the hinge that converts the institutional stimulus into internal capability.

Innovation performance was the second key lever. It advanced sustainable performance directly (H8, beta = 0.269) and also fed green technology innovation (H7, beta = 0.174).

Green technology innovation, by contrast, mattered but least. Its effect on sustainable performance was significant yet small (H9, beta = 0.091, $f^2 = 0.025$), and the two indirect paths that ran through it were not significant. It echoes prior reports that the innovation-to-green-technology relationship is real but fragile and context-dependent (Shehzad et al., 2024; Shahzad et al., 2020). A plausible reading is that, where firms are small and the policy and digital stimulus is strong, green outcomes are advanced partly through routine efficiency and digitally enabled process improvements rather than principally through formal green technology innovation. Interpreted honestly, the modest green-technology effect refines rather than rejects the NRBV chain (Hart, 1995). Green technology innovation is a genuine but secondary lever in this setting.

Finally, specifying sustainable performance as a higher-order construct revealed that its economic, environmental and social dimensions were reflected in near-equal proportion (loadings of the second-order construct on the three dimensions of 0.900, 0.907 and 0.908), and that the antecedents advanced overall sustainable performance rather than trading one pillar against another.

Taken as a whole, the pattern of results reconciles two literatures that have largely developed in parallel. By modelling both in one structure, the study shows that the two are sequential rather than rival explanations, since policy is the trigger, digital transformation and innovation performance are the transmission mechanism, and green technology innovation is a narrower downstream contributor. The comparatively weak green-technology path further cautions against generalising the strong innovation-to-green effects reported in large-firm or heavily regulated settings to resource-constrained SMEs (Shehzad et al., 2024).

Implications

Theoretical implications

The study makes three theoretical contributions. First, it integrates institutional theory with the dynamic capabilities view and the natural-resource-based view to explain digital and green transformation in resource-constrained firms (Hart, 1995; DiMaggio and Powell, 1983; Teece et al., 1997). Second, it specifies a sequential capability chain, from digital transformation to innovation performance to green technology innovation and sustainable performance, and quantifies the relative strength of the direct and indirect channels. Third, by modelling sustainable performance as a balanced

higher-order construct, it advances measurement practice and demonstrates that the drivers operate on integrated sustainability rather than on isolated pillars (Sarstedt et al., 2019; Marzouk and El Ebrashi, 2024).

Practical implications

Two practical implications follow. First, policymakers should recognise that, for SMEs, the policy environment is a first-order lever. Clear incentives, effective monitoring, digital-infrastructure support and credible sustainability strategies can move economic, environmental and social performance directly and can catalyse internal capability building, especially digital transformation. Second, managers should treat digital transformation as the hinge of their capability strategy, because it is the strongest internal driver of innovation performance and a direct contributor to sustainability.

Conclusion

This study examined how government policies shape the sustainable performance of SMEs through digital transformation, innovation performance and green technology innovation, using PLS-SEM on 318 firms in Vietnam. All nine hypothesised direct effects were supported. Digital transformation and innovation performance formed the central capability channel that carried the institutional stimulus onward to sustainable performance, while green technology innovation contributed a significant but comparatively modest final link.

Limitations and future research directions

The study has limitations that qualify its conclusions and point to future work. The cross-sectional, single-respondent, self-report design limits causal inference and leaves open the possibility of endogeneity through omitted variables or reverse causality; although the full-collinearity check indicates that common method bias is not substantial (Kock, 2015), the design cannot fully rule these threats out, and longitudinal or multi-respondent data would strengthen causal claims. No formal robustness analysis, such as multigroup comparison across sectors or an alternative estimator, was performed, and future work could add such checks. The sample is also drawn from two broad sectors in the southern key economic zones of a single emerging economy, so generalisation to other institutional contexts should be cautious; comparative and cross-country designs, and the addition of boundary conditions such as firm size, environmental dynamism or green culture, would extend the model's reach. A further limitation concerns item content. Some items across the sustainable-performance dimensions overlap conceptually with the antecedent constructs, since EcP1 and EcP3 both attribute economic gains explicitly to innovation and digital adoption and SoP3 refers to financial performance alongside sustainability goals, which may inflate the estimated associations between the capability constructs and sustainable performance and should be addressed by purifying the item pool in future applications. Finally, no control variables such as firm size, firm age, industry sector, ownership or

export orientation were included in the structural model, so part of the estimated effects may reflect unmodelled heterogeneity; future studies should incorporate such controls and examine them as boundary conditions.

Declaration on the use of generative AI. Generative AI tools were used to assist with language editing and the organisation of the manuscript. All analyses, interpretations and conclusions are the authors' own, and the authors take full responsibility for the content.

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THE EFFECT OF NATURE IN THE WORKPLACE: HOW NATURAL ELEMENTS IMPROVE EMPLOYEE WELL-BEING AND PERFORMANCE

Lisauskienė, Asta[1], Joye, Yannick[2]

[1]ISM University of Management and Economics, Vilnius, Lithuania

[2]Faculty of Economics and Business Administration, Vilnius University, Vilnius, Lithuania

Keywords: Nature in the Workplace; Work Tasks; Fractal Patterns; Motivation; Employee Well-being

Introduction

The physical workplace environment is increasingly important for employee well-being and cognitive performance. Nature in work settings has been linked to better attention, lower stress, and higher productivity. These benefits may result not only from cognitive restoration, but also from nature's rewarding qualities, which can increase motivation and effort. Understanding these effects can help create workplaces that support well-being and sustainable performance.

Objectives

This research examines, across three different experiments, whether visual exposure to nature or fractal patterns representing nature's geometry can enhance motivation and cognitive performance in work-related tasks.

Theoretical Framework

This study is based on two perspectives: Attention Restoration Theory and the Nature-as-Reward Hypothesis. Attention Restoration Theory explains that natural environments help restore directed attention, which can improve later cognitive performance (Kaplan & Berman, 2010; Scott et al., 2021). The Nature-as-Reward Hypothesis suggests that nature can also increase motivation because it is aesthetically rewarding (Joye & Fischer, 2020; Joye et al., 2024). Fractal patterns, which reflect the geometry of many natural forms, may therefore improve work-task performance by supporting both restoration and motivation (Coburn et al., 2019).

Materials and Methods

This study presents three experiments on how visual stimuli affects motivation and performance in repetitive work tasks. The first compares beautiful fractals with less beautiful pixelated versions in a box-ticking task across multiple rounds. The second examines fractal versus pixelated images before simple and cognitively demanding clicking tasks over five rounds. The third experiment follows a similar design but examines whether exposure to natural stimuli can facilitate delayed gratification and how images containing natural elements influence the choice between a boring task and a more pleasurable one.

Main Findings and Contribution

The findings suggest that visually appealing patterns may support motivation and task persistence, although results were mixed. In the first study, participants ticked more boxes after viewing beautiful fractals than pixelated images, supporting the nature-as-reward hypothesis. In the second study, fractals were linked to lower performance in the simple task, but to more stable motivation over five rounds in the cognitively demanding task. The third study is still in progress, and its results will be presented at the conference.

Originality and Value

The findings provide preliminary evidence that aesthetically pleasing natural patterns may influence task persistence and cognitive engagement. By examining how visual elements of the physical work environment affect motivation and performance, this research contributes to discussions on workplace design, employee well-being, and sustainable work environments.

Research Limitations

This research has several limitations. The online between-subjects design reduced control over participants' viewing conditions, attention, and task environment. In addition, the unexpected finding in the second experiment suggests that task structure or randomization may have influenced the results. Finally, because exposure was brief and limited to screen-based images, the findings may not fully reflect how nature-inspired patterns function in real workplace settings.

Theoretical and Practical Implications

This research contributes to the literature on nature exposure by combining Attention Restoration Theory and the Nature-as-Reward Hypothesis. The findings suggest that nature-inspired stimuli may support not only cognitive restoration, but also motivation and task persistence. Practically, the study indicates that incorporating nature-inspired visual elements into offices, digital workspaces, or break areas may support employee well-being and sustained performance, especially during mentally demanding tasks.

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CO-DESIGNING GREEN SKILLS CURRICULA THROUGH MULTI-STAKEHOLDER ENGAGEMENT: THE ERASMUS+ SUSTAINET PROJECT

Georgia Sakka[1] and Annita Eliade[2]

[1]CIIM Business School, University of Limassol, Limassol, Cyprus

[2]University of Limassol, Limassol, Cyprus

Keywords: Green skills; curriculum co-design; multi-stakeholder engagement; municipalities; vocational education and training (VET); higher education; sustainable development.

Introduction

The transition towards a climate-neutral and circular economy has significantly increased the demand for green skills across all sectors of the economy. While European policy initiatives and legislation have advanced sustainability commitments, considerable education and training systems continue to face challenges in aligning their curricula with rapidly evolving labour market requirements (Filho et al., 2025). This mismatch is particularly evident at the local level, where municipalities, businesses, vocational education and training (VET) providers, and higher education institutions (HEIs) play a central role in supporting regional green transitions but often operate in isolation. Addressing these challenges requires collaborative approaches that integrate stakeholder perspectives into curriculum development and ensure that educational provision reflects and corresponds to emerging sustainability competencies.

The Erasmus+ SUSTAINET project (Empowering Local Governance for Sustainable Economic Growth through a Network of Green Business Innovation Hubs) responds to this need by establishing a collaborative framework for identifying green skills requirements and translating them into updated educational curricula through Green Business Innovation Centres (GBICs). The project adopts a multi-stakeholder approach that brings together academia, VET providers, local authorities, businesses and industry representatives to co-design education that supports sustainable local economic development.

Purpose

This paper presents the ongoing work undertaken within the SUSTAINET project, and especially focuses on identifying current and future green skills requirements and using this evidence to inform curriculum development in VET and higher education. The study seeks to answer the following research question:

How can multi-stakeholder engagement contribute to the co-design of green skills curricula that better reflect regional labour market needs and support the green transition?

Theoretical Background

Contemporary approaches to curriculum development increasingly emphasise stakeholder participation, responsiveness to labour market needs, and competence-based education. Within the context of sustainability, green skills extend beyond technical environmental knowledge to include systems thinking, sustainable innovation, digital competencies, circular economy principles, environmental governance, collaboration, and problem-solving capabilities (Sakka et al., 2026). Previous studies have highlighted persistent skills mismatches between educational provision and labour market demand, particularly in rapidly evolving sustainability-related occupations. Effective curriculum development therefore requires continuous dialogue between education providers and employers, ensuring that learning outcomes remain relevant to emerging economic and societal challenges. Multi-stakeholder engagement has consequently become an important mechanism for strengthening the responsiveness, relevance and long-term sustainability of educational programmes.

Methodology

The study adopts a mixed-method, evidence-informed approach implemented across the participating countries of Cyprus, Greece and Bulgaria.

The first phase involved a comprehensive secondary analysis of recent international and European reports on green skills. This analysis enabled the identification of emerging green competencies and future workforce requirements.

Building upon these findings, the second phase involves the administration of two structured closed-ended questionnaires: one addressed to enterprises and one addressed to Vocational Education and Training (VET) providers and Higher Education Institutions (HEIs). The questionnaires aim to identify current and future green skills needs, assess the extent to which these skills are currently reflected in educational provision, and explore opportunities for strengthening curriculum alignment with labour market requirements.

Structured questionnaires are being used to investigate:

- current green skills demanded by employers;
- anticipated future competency needs;
- existing educational provision;
- perceived gaps between educational provision and labour market expectations; and;
- priorities for future curriculum enhancement.

The evidence generated through both phases will subsequently be synthesised to support the co-design of updated curricula and training programmes that will be delivered through the GBICs developed within the SUSTAINET project.

Preliminary Findings

Data collection is currently in process; however, preliminary observations indicate strong consensus among stakeholders regarding the increasing importance of interdisciplinary green competencies. Early evidence suggests growing demand for skills related to sustainable business practices, circular economy implementation, environmental management, green innovation, digital transformation for sustainability, and sustainability leadership.

Initial feedback also indicates that although many VET providers and HEIs have incorporated sustainability into existing programmes, important gaps remain regarding practical application, interdisciplinary integration, and alignment with regional labour market needs. Stakeholders consistently emphasise the importance of closer collaboration between education providers, businesses and local authorities to ensure that graduates possess competencies directly applicable to the green transition.

Practical Implications

The findings are expected to provide practical guidance for HEIs, VET providers, municipalities, and policy makers seeking to modernise sustainability education, align curricula with current and emerging green skills competencies, and strengthen the capacity of education systems to support the green transition and sustainable development.

Beyond the SUSTAINET consortium, the proposed framework may offer a transferable model for other regions seeking to establish collaborative mechanisms for evidence-based curriculum development in support of the European Green Deal and the broader green transition.

Limitations and Future Research

As the stakeholder consultation is currently ongoing, this paper presents work in progress and reports preliminary observations rather than final empirical findings. Future research will analyse the complete dataset across all participating countries, compare national priorities, evaluate the effectiveness of the co-designed curricula following implementation, and examine the long-term contribution of GBICs to regional skills ecosystems and sustainable development.

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AN EXPLORATORY STUDY ON THE MEASUREMENT OF SOCIAL IMPACT OF SOCIAL ENTERPRISES IN EMERGING AND DEVELOPING COUNTRIES

Wenz, Mara[1]

[1] Oulu Business School, University of Oulu, Oulu, Finland & Pforzheim University, Pforzheim, Germany

Keywords: Social Impact, Measurement, Social Enterprise, Emerging and Developing Countries

Abstract

Social enterprises have gained prominence as mechanisms for addressing social challenges and fostering community self-sustainability (Scartozzi et al., 2025). Central to this endeavour is social impact measurement, which enables social enterprises to assess whether their activities address the most pressing societal needs and generate outcomes that matter to beneficiaries (Costa and Andreaus, 2021). Because social impact is a social construct, its meaning is inherently context-dependent (Kah and Akenroye, 2020) and should therefore be examined through careful, context-sensitive inquiry (Berger and Luckmann, 1966). While prior scholarship has advanced frameworks for conceptualizing and measuring social impact (e.g. Banerjee et al., 2024; Quilloy-Custodio et al., 2024), multiple authors find that there is a dearth of studies evaluating social impact in the context of emerging and developing economies (EMDEs) (Mohiuddin and Yasin, 2023; Weber Kirst et al., 2021). This study addresses this gap by examining how social impact is understood and measured by social entrepreneurs operating in selected EMDEs through ten semi-structured interviews, adopting an exploratory research design, given the limited empirical evidence and the contextual novelty of the phenomenon. This approach enables the development of an initial yet nuanced understanding that can inform and structure future theory building and empirical inquiry. The research questions addressed in the empirical study are (1) how is social impact understood in an EMDE context? and (2) how can social impact be measured?

Our findings reveal that social impact in EMDEs is conceptualized as a long-term, targeted, and culturally embedded positive outcome. Rather than being limited to short-term outputs, social impact is understood as the creation of sustained individuals, families, and communities. Key manifestations of impact include stable income generation, healthy social relationships,

improved mental and physical health, access to training and capabilities, and a safe environment. Measurement of social impact is viewed as inherently relational and systemic, requiring attention to the interdependencies and potential trade-offs between people, profit, and planet to achieve sustainability. Beyond formal tools and metrics, respondents emphasize the centrality of trust-based relationships, deep engagement in beneficiaries' lives, and experiential knowledge. Accordingly, transparent reporting of social impact should extend beyond quantitative indicators to include qualitative, firsthand accounts. Finally, we propose a localized–standardized approach to social impact measurement, combining cross-contextual comparability with sensitivity to languages, religions, and cultural norms.

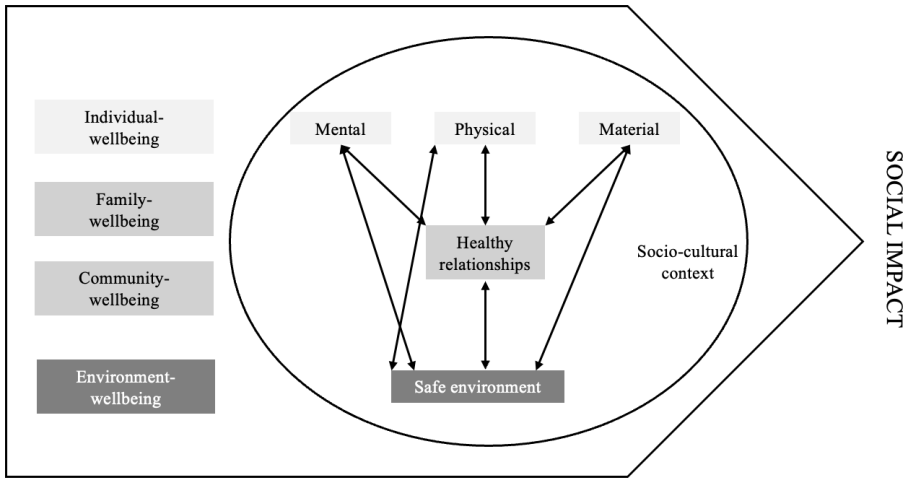


Figure 1: Holistic Health Framework

This study contributes to social entrepreneurship research by foregrounding EMDEs perspectives and challenging the universality of existing social impact frameworks. While social impact might be defined as a positive outcome, the way to achieve social impact can have both positive and negative effects. Thus, the negative side of social entrepreneurship must also be explored. Lastly, it is notable that interviews can be prone to personal and cultural biases, affecting the objectivity of findings.

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FROM ENDORSEMENT TO ACCOUNTABILITY: CORPORATE GOVERNANCE OVERSIGHT OF CSR–SDG INITIATIVES IN PUBLICLY LISTED FIRMS

Karim S. Rebeiz and Sam El Nemar
University of Balamand,
Faculty of Business and Management, Lebanon,

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Abstract

The Sustainable Development Goals (SDGs) have emerged as a matter of considerable planetary importance, increasingly shaping global policy agendas, societal expectations, and public discourse. This heightened attention has extended to major publicly listed corporations, driven by escalating demands from investors, regulators, and an ever-expanding constellation of stakeholders. The SDGs may be understood as an evolutionary extension of corporate social responsibility (CSR), marking a shift from predominantly discretionary, firm-level initiatives toward a more structured, globally articulated, and externally anchored sustainability agenda. Despite their growing prominence, corporate engagement with CSR-SDG initiatives often remains largely ceremonial, exerting limited influence on core strategic decision-making processes. This paper develops a conceptual governance framework grounded in the corporate governance and CSR literature to explain this persistent disjunction and to identify the conditions under which publicly-listed firms can move from symbolic endorsement to substantive implementation of the SDGs. Specifically, it highlights four interrelated boardroom attributes, composition, competence, culture, and commitment, that shape the board of directors' capacity to integrate the SDGs into strategic oversight and to translate CSR aspirations into concrete organizational practices, supported by clear CEO and senior executive accountability. The analysis further underscores the coordinating role of key board committees, namely nomination and governance, compensation, audit, and dedicated CSR or ESG committees, in aligning incentive structures, monitoring mechanisms, and control systems with CSR–SDG objectives. Taken together, these governance

arrangements illustrate how firms may move beyond institutional conformity and reputational signaling toward credible, embedded, and impactful SDG implementation.

Introduction

The Sustainable Development Goals (SDGs) have become a central reference point in contemporary debates on the role of corporations in addressing pressing global challenges. In particular, highly visible publicly listed firms are increasingly expected to position themselves as active contributors to global development priorities, including environmental protection, social inclusion, and responsible economic growth. This expanding corporate engagement reflects not only heightened societal and stakeholder expectations but also a broader rethinking of corporate purpose in an era marked by intensifying and interconnected sustainability challenges (Saeed et al., 2025). Consequently, firms face mounting pressure to align their corporate social responsibility (CSR) commitments with the SDGs (Lu et al., 2021), and many increasingly leverage social media platforms to signal and publicize their engagement with SDG-related initiatives (ElAlfy et al., 2020).

Despite this growing prominence, corporate engagement with the SDGs frequently remains rhetorical, falling short of meaningful integration into organizational practices. SDG-related initiatives are often confined to discrete projects, reporting exercises, or philanthropic activities that remain peripheral to core corporate strategy. In such contexts, sustainability considerations are weakly embedded in decision-making processes, and senior executives face limited accountability for related outcomes. This paper argues that the disjunction between rhetoric and practice in advancing SDG objectives cannot be explained solely by managerial opportunism or executive neglect. Rather, it reflects deeper shortcomings within firms' governance arrangements, particularly at the level of the board of directors, the highest authoritative body charged with strategic oversight, managerial monitoring, and the safeguarding of long-term corporate interests. Boards ultimately determine which issues command sustained attention, how executive performance is evaluated, and whether organizational commitments are translated into enforceable strategic priorities. As such, they play a decisive role in shaping whether sustainability engagement

becomes sustained, substantive, and impactful, or instead remains peripheral, episodic, and symbolic.

Yet existing scholarship on sustainability and corporate responsibility tends to treat governance as a contextual or mediating condition rather than as a central explanatory mechanism for CSR–SDG engagement. Where boards are examined, scholarly attention often centers on surface-level characteristics, such as independence, size, diversity, or the presence of CSR-related committees, without adequately considering the broader constellation of attributes and processes through which boards influence sustainability outcomes. Consequently, the governance mechanisms through which boards can transform symbolic endorsement into executive accountability and substantive implementation remain under-theorized. Addressing this gap, the paper advances a governance-centered perspective on corporate engagement with the SDGs in publicly listed firms with diffuse shareholders by positioning the board of directors as the central locus through which sustainability commitments are either rendered symbolic or transformed into enforceable strategic priorities. It argues that, within the context of publicly traded corporations, the effectiveness of sustainability initiatives depends less on the volume or visibility of CSR–SDG activities than on the degree to which such commitments are embedded within the firm's governance architecture.

The conceptual framework guiding this analysis, illustrated in Figure 1, theorizes four interrelated boardroom attributes—the "four Cs" of composition, competence, culture, and commitment—as foundational conditions shaping the board's capacity to exercise substantive sustainability oversight under conditions of dispersed ownership, regulatory scrutiny, and capital market pressure. The framework further conceptualizes board committees as governance vehicles through which these attributes are operationalized, translating normative sustainability commitments into concrete oversight routines, incentive alignment mechanisms, and monitoring processes. In doing so, the framework elucidates the governance pathways through which publicly listed firms move from symbolic endorsement toward accountable and impactful engagement with global sustainability goals.

From CSR to SDG Governance

CSR predates the emergence of the SDGs and reflects a long-standing scholarly effort to move the corporation toward more purposeful and socially oriented goals. Carroll's seminal framework conceptualizes CSR as a layered construct encompassing economic and legal responsibilities alongside ethical and discretionary dimensions that reflect evolving societal expectations (Carroll, 1979, 1991). This framework established CSR as a mechanism through which corporations respond to societal demands that extend beyond compliance and profit maximization.

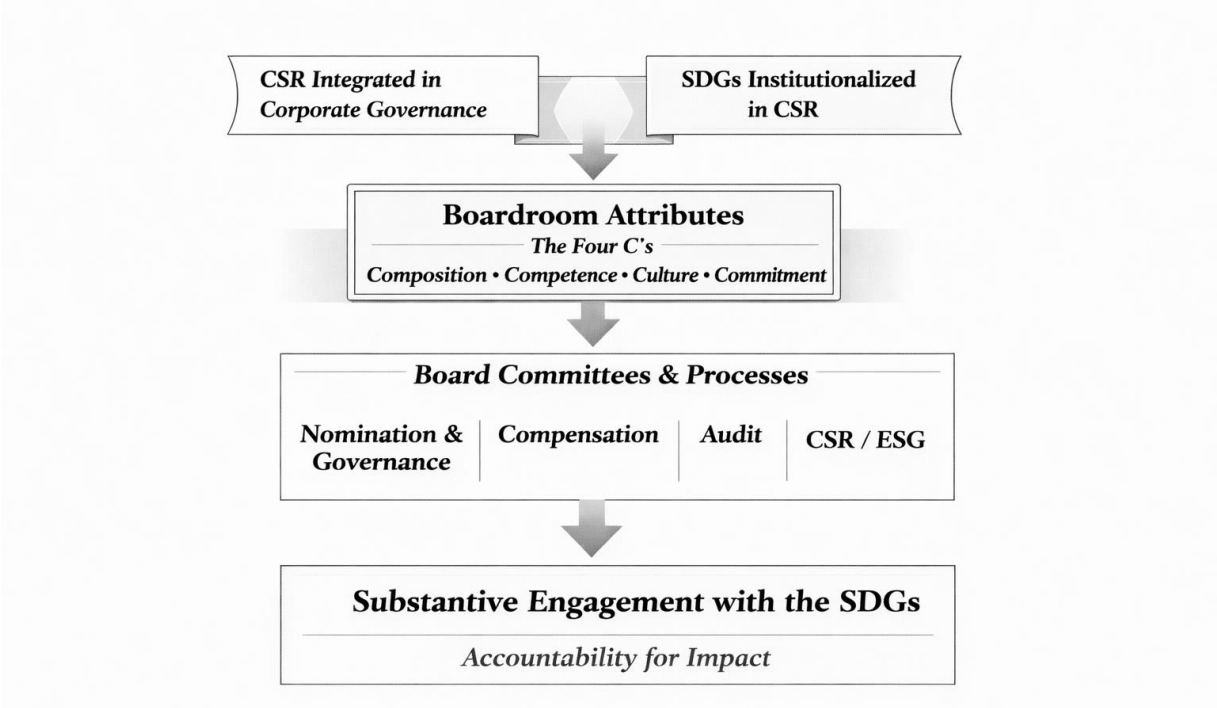


Figure 1. Corporate Governance Framework for CSR–SDG Implementation

Subsequent scholarship has emphasized that credible responsibility cannot rest on aspirational claims alone. Wood's corporate social performance model shifted attention from intentions to observable processes and outcomes, underscoring the importance of managerial systems, accountability mechanisms, and verifiability in assessing corporate responsibility (Wood, 1991). Related work suggests that CSR may enhance organizational reputation and, over time, contribute to improved performance through trust, legitimacy, and risk management, while cautioning against reducing CSR to a purely instrumental logic detached from its broader societal purpose (Carroll

and Shabana, 2010). Collectively, these streams position CSR as an organizational interface through which external expectations are interpreted, operationalized, and evaluated.

At the same time, CSR has long been vulnerable to symbolic adoption. In response to stakeholder pressures, reputational concerns, or regulatory scrutiny, firms may adopt highly visible CSR policies and disclosures that signal conformity without substantively altering core practices (Qaderi, 2025). Research on symbolic management and institutional decoupling illustrates how organizations may formally espouse responsible practices while actual behaviors remain largely unchanged (Fiss and Zajac, 2006).

In the context of SDG-related initiatives, CSR is expected to facilitate the integration of sustainability considerations into core organizational processes, including investment appraisal, supply chain governance, human resource management, and product and service development (Gond et al., 2011). CSR provides the organizational infrastructure through which SDG commitments are operationalized, via formal policies, codes of conduct, risk management systems, and reporting practices that specify how sustainability objectives are pursued and monitored (Eccles et al., 2014).

Moreover, CSR offers firms a framework through which resource allocation decisions, whose benefits are uncertain, diffuse, or temporally distant, can be legitimized. This helps explain why the effects of CSR on corporate financial performance vary across firms, depending on the rigor, credibility, and impact of their CSR practices (Barnett, 2007). In particular, firms often struggle to reconcile short-term financial imperatives with longer-term social or environmental outcomes (Margolis et al., 2007).

To date, corporate commitment to the SDGs remains largely voluntary, with relatively few regulatory mandates imposing binding obligations. While such voluntarism allows for flexibility and experimentation, it also heightens the risk that SDG engagement remains selective, episodic, or symbolic. In the absence of robust governance mechanisms (Awuah, 2025), CSR–SDG initiatives are therefore likely to remain peripheral rather than fully embedded within strategic and operational decision-making processes.

This reality foregrounds the oversight role of the board of directors, which is uniquely positioned to determine whether CSR–SDG engagement becomes substantive or remains symbolic. As the steward of corporate governance, the board influences not only strategic prioritization but also the incentive structures, monitoring systems, and accountability arrangements that shape executive behavior. However, the mechanisms through which boards exercise this influence vary across firms, reflecting heterogeneity in board composition, capabilities, and governance practices, with important implications for the effectiveness of CSR–SDG implementation.

To reduce the likelihood that sustainability engagement remains peripheral or episodic, boards must possess appropriate attributes, competence, culture, and commitment, and establish governance processes that channel sustained attention to CSR–SDG objectives. These processes are most visibly enacted through board committees, which translate broad responsibility commitments into concrete oversight and accountability structures, thereby providing the foundation for the analysis developed in the sections that follow.

Boardroom Attributes for CSR-SDG Oversight

Boardroom composition

A critical dimension of board composition is independence. Independent directors play a central monitoring role by constraining managerial discretion and mitigating agency problems (Rebeiz, 2005, 2015, 2018). In the sustainability domain, independence is particularly valuable because CSR–SDG initiatives are often susceptible to reputational motivations and symbolic adoption. Independent directors are better positioned to challenge initiatives that prioritize visibility over substance and to require management to justify sustainability investments in terms of long-term risk mitigation, regulatory preparedness, and organizational resilience rather than short-term reputational gains (Neves et al., 2023).

Empirical research suggests that boards with a higher proportion of independent directors are more likely to be associated with superior CSR performance (Agarwala et al., 2023). However, other studies report contrasting findings, including evidence of a negative relationship between board

independence and CSR outcomes (Naciti, 2019). These mixed results can be rationalized by recognizing that, while independence reduces agency costs, an exclusive reliance on independent directors may weaken oversight if it comes at the expense of firm-specific knowledge. Sustainability challenges often involve complex operational trade-offs that external directors may struggle to fully apprehend.

In this context, insiders or executive directors contribute essential contextual intelligence derived from their familiarity with the firm's technologies, organizational capabilities, cost structures, and stakeholder relationships (Rebeiz, 2016). For instance, when evaluating commitments to reduce environmental footprints or enhance workforce well-being, insiders can clarify feasibility constraints, unintended consequences, and implementation timelines that may not be readily apparent to outsiders. A balanced board configuration thus allows independence to discipline managerial behavior while insider knowledge enhances decision quality. It also enables more nuanced deliberations over the trade-offs between financial performance and social or environmental objectives that are inherent to SDG implementation.

Boardroom Competence

Beyond composition, board competence also has an impact on ensuring that the corporation undertakes CSR-SDG initiatives with substantive impact (Sanchez et al., 2017). In this respect, board competence refers to the collective knowledge, skills, and experience that directors bring to the governance of sustainability issues. Traditional conceptions of board expertise have emphasized financial literacy, industry experience, and legal competence. While these remain necessary, they are insufficient for governing SDG-related concerns, which span environmental science, social risk, stakeholder engagement, and long-term value creation. Boards lacking such competence may struggle to critically evaluate sustainability strategies, challenge managerial assumptions, or assess trade-offs between short-term performance and long-term societal outcomes. Empirical research suggests that boards with greater sustainability-related expertise are better positioned to integrate environmental and social considerations into strategic decision-making rather than relegating them to peripheral discussions.

Boards that value cognitive diversity and encourage informed debate are more likely to recognize the systemic and interdependent nature of SDG challenges. Conversely, boards dominated by homogenous backgrounds or narrow financial perspectives may default to compliance-oriented approaches that emphasize disclosure over substantive change. Specifically, some research supports the notion that board gender diversity promotes sustainable development, but it must be activated through appropriate board processes and interactions (Orazalin and Baydauletov, 2020).

Boardroom Culture

Board effectiveness is not merely a function of boardroom composition or individual director credentials; it also reflects the board's capacity to mobilize and integrate diverse forms of expertise through the culture it cultivates (Salvioni et al., 2018). Board culture encompasses the shared norms, values, and interaction patterns that shape which issues are prioritized, how dissent is expressed and managed, and whether directors feel empowered to challenge managerial narratives. In boards characterized by strong cohesion but limited critical engagement, sustainability discussions may remain superficial, reinforcing consensus around symbolic commitments rather than probing their operational and strategic implications. By contrast, cultures that encourage constructive challenge and reflexivity are more likely to surface tensions between SDG ambitions and existing incentive structures or prevailing business models.

Research on board dynamics underscores that effective oversight depends on a careful balance between trust and control (Brundin and Nordqvist, 2008; Letendre, 2004). While trust facilitates open information exchange, excessive deference to management can weaken the board's monitoring role, particularly in domains, such as sustainability, where outcomes are difficult to measure and managerial claims are hard to verify. A board culture that normalizes critical inquiry and values long-term perspectives increases the likelihood that SDG-related initiatives are assessed not only for their symbolic appeal but also for their strategic coherence and substantive impact. Board leadership plays a pivotal role in shaping such a culture and, ultimately, in influencing corporate performance (Kang and Zardkoohi, 2005; Rebeiz, 2001, 2002). Chairs who foster inclusive participation, manage dominant voices, and frame sustainability as a strategic rather than a purely moral concern can significantly enhance the quality of board deliberations on sustainability issues.

Boardroom Commitment

Board commitment reflects the extent to which boards perceive CSR and the SDGs as integral to their fiduciary responsibilities rather than as peripheral or discretionary concerns (Marx and Van Dyk, 2011). Committed boards consistently signal the strategic importance of sustainability through agenda-setting, sustained follow-up in boardroom deliberations, and the explicit incorporation of SDG considerations into strategic reviews and oversight processes. Beyond symbolic endorsement, such boards demonstrate proactivity by investing in the acquisition of relevant expertise, reallocating attention and resources, reshaping boardroom norms, and demanding more rigorous, decision-relevant sustainability information from management.

A critical dimension of board commitment lies in accountability. Boards that are substantively engaged in CSR–SDG governance are willing to hold senior executives accountable for sustainability performance through structured monitoring, performance evaluation, and incentive alignment. This may involve setting explicit sustainability objectives, assessing progress against predefined benchmarks, and responding credibly to underperformance. Exercising such accountability often requires resolve, particularly when sustainability objectives conflict with short-term financial targets or managerial preferences. Commitment, in this sense, is revealed not only in what boards endorse but in their willingness to impose consequences and sustain attention over time.

Boardroom commitment is also shaped by directors' personal values and normative orientations. While boards operate within formal legal and economic constraints, directors' beliefs about the social role of the corporation influence how sustainability issues are framed, interpreted, and prioritized. Boards whose members view CSR as integral to corporate purpose are more likely to engage proactively with the SDGs, whereas boards that regard sustainability primarily as a reputational or compliance issue tend to favor symbolic or minimally demanding responses. These normative orientations shape deliberative dynamics and affect the intensity with which sustainability considerations are integrated into governance decisions.

Finally, commitment is reinforced through learning and adaptation. Boards that invest in ongoing education, seek external perspectives, and engage in reflexive evaluation of their own governance practices demonstrate a capacity to evolve alongside emerging sustainability challenges. Such an adaptive orientation is particularly important given the dynamic nature of the SDGs and the shifting expectations of stakeholders. Over time, commitment expressed through learning, accountability, and sustained engagement enables boards to move from endorsement to effective oversight, enhancing the likelihood that sustainability objectives translate into substantive organizational action and meaningful societal impact.

Boardroom Committees and CSR–SDG Oversight

While board composition, competence, culture, and commitment shape the orientation of sustainability oversight, these attributes must be translated into organizational influence through formal governance mechanisms. Boardroom committees play a central role in this translation process by structuring attention, allocating responsibility, and embedding sustainability concerns into recurring oversight routines. Prior research emphasizes that committees function as the board's primary instruments for addressing complex, information-intensive issues that require sustained monitoring beyond episodic plenary discussion (Harrison, 1987). In the context of corporate engagement with the SDGs, committees provide the institutional channels through which responsibility is assigned, performance is evaluated, and executive accountability is enacted.

From a governance perspective, committees serve two complementary functions. First, they enable specialization by allowing directors to deploy distinctive expertise in specific domains, such as executive compensation, risk oversight, or stakeholder relations. Second, they create procedural regularity, ensuring that sustainability-related issues are addressed systematically rather than opportunistically. In the absence of committee-level structures, SDG engagement is more likely to remain ad hoc, vulnerable to shifting managerial priorities, and dependent on individual champions rather than institutionalized oversight.

Governance or nomination committees play a foundational role in shaping the firm's long-term capacity for CSR–SDG engagement. Through their influence over board composition, succession

planning, and governance policies, these committees determine whether sustainability-relevant expertise and perspectives are present at the apex of the organization. By explicitly incorporating sustainability competence and experience into director nomination criteria, governance committees can strengthen the board's ability to oversee SDG-related strategies in a substantive rather than symbolic manner.

Compensation committees are central to addressing one of the most persistent barriers to substantive SDG engagement: the misalignment between sustainability objectives and executive incentives. A growing body of research demonstrates that executive pay structures strongly influence managerial attention and behavior, particularly when performance metrics are clear, measurable, and consequential (Core, Holthausen, and Larcker, 1999). When sustainability goals are excluded from incentive contracts, or included only marginally, executives face limited motivation to prioritize SDG-related outcomes. Compensation committees therefore play a critical role in determining whether CSR–SDG commitments are translated into enforceable performance expectations through incentive design, evaluation criteria, and pay–performance sensitivity. In the absence of clearly specified accountabilities, incentive-based mechanisms are likely to remain symbolic (Haque and Ntim, 2020).

Audit committees contribute to CSR–SDG governance by enhancing the credibility, reliability, and comparability of sustainability-related information. As firms increasingly disclose non-financial performance indicators linked to the SDGs, audit committees oversee reporting processes, internal controls, and assurance mechanisms that reduce information asymmetry and constrain managerial discretion. Prior research suggests that strong and independent audit committees improve the quality of corporate disclosures, thereby strengthening the informational foundations upon which accountability depends (Kalbers and Fogarty, 1993; Klein, 2002). In the absence of such oversight, sustainability reporting risks becoming performative, reinforcing symbolic compliance rather than enabling meaningful evaluation (Al-Shaer and Zaman, 2018).

In recent years, many firms have also established dedicated CSR or ESG committees to concentrate attention on sustainability-related issues. These committees typically serve as coordinating bodies, linking SDG initiatives with strategic planning, risk management, and stakeholder engagement

processes. While the mere existence of a CSR or ESG committee does not guarantee substantive impact, such structures can enhance issue salience, facilitate cross-committee coordination, and promote continuity in sustainability oversight when endowed with clear mandates and authority (Rebeiz and Al Daia, 2026). Importantly, their effectiveness depends on how they interact with traditional committees rather than operating in isolation.

Taken together, board committees constitute the governance architecture through which CSR–SDG commitments are operationalized, monitored, and enforced. When committee mandates are clearly defined, aligned, and mutually reinforcing, sustainability oversight is more likely to be embedded within core governance processes. Conversely, fragmented committee structures or ambiguous responsibilities increase the risk that SDG initiatives remain symbolic, diffused across committees without clear ownership or accountability. The effectiveness of board committees therefore lies not only in their individual roles but also in their collective capacity to integrate sustainability into the firm's overarching governance system.

Conclusions

The growing prominence of sustainability concerns at the global level has reshaped the discourse on corporate responsibility, positioning firms as central actors in addressing complex social and environmental challenges. Yet, as this paper has argued, the proliferation of SDG-related commitments, often articulated through CSR initiatives, has not been matched by a corresponding transformation in the governance of sustainability within corporations. Too often, CSR–SDG engagement remains symbolic: highly visible in rhetoric and disclosure, yet weakly embedded in the governance structures that shape managerial behavior, strategic decision-making, and accountability. This paper advances a governance-centered perspective to explain why this gap persists and how CSR–SDG engagement can move beyond symbolism. It argues that CSR–SDG initiatives generate meaningful impact only when supported by credible governance arrangements that ensure effective oversight, accountability, and enforcement. Absent such arrangements, CSR–SDG commitments risk remaining peripheral to firms' core governance systems.

The analysis demonstrates that substantive and impactful CSR–SDG engagement depends not only on formal corporate governance structures but also on boardroom attributes, composition, competence, culture, and commitment that jointly condition the board's capacity to engage with sustainability challenges that are complex, long-term, and resistant to conventional performance metrics. When these attributes are weak or misaligned, CSR–SDG engagement is likely to remain episodic and symbolic; when they are strong and mutually reinforcing, boards are better positioned to embed CSR–SDG considerations into strategic oversight and accountability processes.

The paper further shows that boardroom orientations must be operationalized through board committees, which play a critical role in institutionalizing CSR–SDG engagement by structuring attention, assigning responsibility, and embedding sustainability concerns into recurring oversight routines. Nomination and governance committees shape the human capital and norms underpinning CSR–SDG oversight; compensation committees determine whether executives face meaningful incentives to pursue CSR–SDG objectives; audit committees enhance the credibility of CSR–SDG information; and dedicated CSR or ESG committees coordinate sustainability initiatives across governance domains. Together, these committees constitute the governance architecture through which CSR–SDG commitments are institutionalized and sustained, thereby enhancing their potential to generate long-term societal impact.

Several avenues for future research emerge from this study. Empirical work could examine how variation in boardroom attributes and committee configurations shapes the depth and durability of CSR–SDG implementation across firms and institutional contexts. Longitudinal studies could explore how boards adapt CSR–SDG governance practices over time, while qualitative research could illuminate the micro-processes through which boards negotiate competing priorities and enforce accountability. Such research would further clarify the conditions under which CSR–SDG engagement moves from aspiration to action.

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PERSONALITY TRAITS AND ORGANIZATIONAL BEHAVIOR AS DRIVERS OF ENTREPRENEURIAL ACTION

Xanthopoulou, Panagiota[1]; Sahinidis, Alexandros[2]; Antoniadis, Ioannis[3]; Vyttas, Vassilis[4]; Papakonstantinou, Sofoklis[5]

[1]Department of Business Administration, University of West Attica, Athens, Greece
[2]Department of Business Administration, University of West Attica, Athens, Greece
[3]Department of Management Science and Technology, University of Western Macedonia, Kozani, Greece
[4]Department of Economics and Business, Neapolis University Pafos, Pafos, Cyprus
[5]Department of Business Administration, University of Macedonia, Thessaloniki, Greece

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Introduction

Entrepreneurship constitutes a significant economic and social driver, contributing to innovation, employment, and societal well-being (Xanthopoulou & Sahinidis, 2024; Neumann, 2022). Contemporary perspectives extend entrepreneurship beyond new venture creation to include entrepreneurial thinking and action within existing organizations, non-profit entities, and the public sector (Aparicio et al., 2020; Turgunpulatovich, 2022). This broader conceptualization underscores the importance of examining both individual and contextual factors that shape entrepreneurial behavior across diverse organizational settings.

A substantial body of research highlights the role of individual-level characteristics—such as personality traits, skills, persistence, optimism, and risk tolerance—in influencing entrepreneurial outcomes (Xanthopoulou & Sahinidis, 2022). At the same time, entrepreneurship research has strongly emphasized entrepreneurial intention as a key antecedent of entrepreneurial behavior. Drawing on cognitive psychology, intention is understood as a mental state that precedes behavior and has been widely identified as a strong predictor of venture creation (Krueger, 1993; Pérez-Macías et al., 2022). Factors such as attitudes toward entrepreneurship, perceived feasibility, need for achievement, and self-control have been shown to influence the formation of entrepreneurial intention (Gieure et al., 2020), alongside social norms, family

background, and demographic characteristics (Georgescu & Herman, 2020).

Despite this extensive focus on entrepreneurial intention, empirical evidence consistently demonstrates that many individuals with strong entrepreneurial intentions do not proceed to entrepreneurial action. This persistent intention–action gap represents a critical theoretical and practical challenge within entrepreneurship research (Shirokova et al., 2016; Nabi et al., 2017). Existing intention-based models often fail to adequately predict entrepreneurial behavior over time, highlighting the need to examine the mechanisms through which intentions evolve and either translate into or disengage from action (Xanthopoulou & Sahinidis, 2024).

Purpose, Aim and Objectives

Against this backdrop, the present study adopts a behavioral and organizational perspective to examine how personality traits and organizational behavior jointly shape entrepreneurial action over time. The study aims to move beyond static intention-based explanations by focusing on the dynamic interaction between individual characteristics and organizational and educational contexts.

Specifically, the study addresses the following research questions:

(RQ1) how personality traits influence the development and evolution of entrepreneurial intentions over time;

(RQ2) how organizational and educational contexts affect the translation of entrepreneurial intention into entrepreneurial action; and

(RQ3) why individuals with strong entrepreneurial intentions fail to engage in entrepreneurial action despite exposure to supportive environments.

Literature Review and Theoretical Framework

The study is grounded in a theoretical framework that integrates research on personality traits, organizational behavior, and the intention–action gap. Prior literature identifies traits such as self-confidence, need for achievement, autonomy, risk tolerance, innovativeness, and internal locus of control as key antecedents of entrepreneurial intention (Do & Dadvari, 2017; Mahfud et al., 2020). However, entrepreneurial behavior is also shaped by organizational and contextual influences, including entrepreneurship education, social networks, and institutional support structures (Stephan et al., 2015; Bogatyreva et al., 2019). While educational interventions often increase entrepreneurial intention, evidence suggests that these effects frequently diminish after program completion and do not necessarily result in entrepreneurial action (Souitaris et al., 2007; Shirokova et al., 2016). This highlights

the need for longitudinal and qualitative approaches that capture changes in intention and behavior over time.

Methodology and Methods

Methodologically, the study adopts a qualitative, longitudinal research design. Data were collected through in-depth semi-structured interviews and diary-based research, enabling the examination of participants' lived experiences, perceptions, and behavioral responses within their natural organizational and educational contexts.

The use of diary methods allows for the collection of real-time data and reduces retrospective bias by capturing fluctuations in entrepreneurial intention, confidence, and engagement as they unfold over time (Bolger et al., 2003). Qualitative data were analyzed using thematic analysis, following a systematic and iterative process of coding and theme development (Braun & Clarke, 2006). This approach facilitated the identification of recurring patterns and underlying mechanisms related to personality traits, organizational influences, and entrepreneurial behavior.

Findings and Contribution

The findings reveal that personality traits play a significant role in the formation and initial strengthening of entrepreneurial intention, addressing RQ1. Traits such as self-confidence, need for achievement, autonomy, and risk tolerance were consistently associated with higher levels of entrepreneurial intention. However, the influence of these traits was found to be dynamic rather than stable, as changes in self-perceived competence, confidence, and risk perception over time affected the persistence of entrepreneurial intention.

Addressing RQ2, the findings demonstrate that organizational and educational contexts are decisive in shaping whether entrepreneurial intentions translate into entrepreneurial action. While entrepreneurship education initially enhances intention, its effects often weaken after formal program completion. The absence of sustained organizational support, limited access to resources, and lack of structured follow-up mechanisms were found to inhibit entrepreneurial action. Conversely, supportive environments, exposure to role models, and experiential learning opportunities facilitated sustained engagement.

With respect to RQ3, the study shows that the intention–action gap emerges from the interaction between individual and organizational factors rather than from a lack of entrepreneurial motivation. Participants with strong entrepreneurial traits frequently disengaged from entrepreneurial activity due to heightened uncertainty, competing

career priorities, perceived institutional barriers, and declining confidence. These findings underscore that entrepreneurial action is a context-dependent behavioral process in which organizational constraints can override individual predispositions.

The study offers original contributions to entrepreneurship and organizational behavior research by shifting the analytical focus from entrepreneurial intention to entrepreneurial action. It refines intention–action models by demonstrating that personality traits primarily influence intention formation, while organizational and contextual reinforcement is critical for action. The longitudinal qualitative design provides rare insight into behavioral turning points that explain why entrepreneurial intentions weaken, persist, or transform into action.

Originality and Value

The study offers original contributions to entrepreneurship and organizational behavior research by shifting the analytical focus from entrepreneurial intention to entrepreneurial action. It refines intention–action models by demonstrating that personality traits primarily influence intention formation, while organizational and contextual reinforcement is critical for action. The longitudinal qualitative design provides rare insight into behavioral turning points that explain why entrepreneurial intentions weaken, persist, or transform into action.

Research Limitations

The findings should be interpreted in light of certain limitations. The study is situated within a specific educational and organizational context, which may limit generalizability to other populations or settings. The reliance on self-reported qualitative data may also introduce subjectivity, although diary methods mitigate retrospective bias. Finally, the observation period remains limited relative to the longer time horizons over which entrepreneurial action may unfold. These limitations point to avenues for future research, including longer-term longitudinal studies and mixed-method designs across diverse organizational and cultural contexts.

Theoretical and Practical Applications and Implications

From a practical perspective, the findings highlight the limitations of entrepreneurship education and organizational interventions that focus predominantly on intention formation. Without sustained support, mentoring, and experiential opportunities, increases in entrepreneurial intention are unlikely to lead to action. The study suggests that fostering entrepreneurial action requires coordinated efforts that align individual

capabilities with supportive organizational and institutional environments.

Overall, the study contributes empirical and conceptual insights by demonstrating that entrepreneurial action is not a direct extension of entrepreneurial intention, but a dynamic, context-dependent outcome shaped by the ongoing interplay between personality traits and organizational behavior.

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GREEN TRANSITION IN EMERGING METROPOLITAN ECONOMIES: DIRECT AND INDIRECT PATHWAYS OF GOVERNMENT REGULATION ON SUSTAINABLE PERFORMANCE

Nguyen, Van Phuong[1]; Nguyen, Ton Thi Tuong Van[1,2]; Vrontis, Demetris[3]

[1] Center for Public Administration, International University,
Vietnam National University-Ho Chi Minh City, Ho Chi Minh, Vietnam

[2] Ho Chi Minh City Cadre Academy, Vietnam

[3] Gnosis: Mediterranean Institute for Management Science,
School of Business, University of Nicosia, 2417, Nicosia, Cyprus

Keywords: Government regulation, Green technology adoption, Sustainable performance, Emerging metropolitan economies, Vietnam.

Introduction

Emerging metropolitan economies must reconcile rapid industrial growth with environmental degradation and trade barriers such as the European Union's Carbon Border Adjustment Mechanism, which strains firms lacking green-innovation capabilities. Ho Chi Minh City, a manufacturing-intensive metropolis under a special environmental-policy regime, is a revealing setting for this tension.

Purpose, Aim and Objectives

The study clarifies how government regulation (GR) is converted into substantive results, with the objective of testing green technology adoption (GTA) as the capability that mediates the link between regulation and sustainable performance (SP). Four hypotheses are tested: GR positively affects SP (H1) and GTA (H2); adoption positively affects performance (H3); and adoption mediates the relationship (H4).

Literature Review and Theoretical Framework

Institutional theory explains why firms converge on similar practices, as coercive, mimetic and normative pressures make green action a condition of legitimacy (DiMaggio and Powell, 1983), while the resource-based view (RBV) and its natural RBV extension explain why firms under identical rules differ, since only inimitable capabilities sustain advantage (Barney, 1991; Hart,

1995). Prior emerging-economy evidence links net-zero regulation to GTA (Singh, 2025), supporting adoption as the mediating capability.

Methodology and Methods

Government regulation was a second-order construct of coercive, incentive and guidance instruments (Wu et al., 2024); GTA used items from Afum et al. (2023); and SP combined economic, environmental and social dimensions (Cancela et al., 2024). Convenience and snowball sampling via business associations gave 398 of 600 responses (66.3%) and 364 valid manufacturing cases. The measurement model met reliability, convergent validity (alpha and CR 0.76 to 0.89; AVE above 0.50) and discriminant validity (HTMT); common method bias was controlled and the standardised root mean square residual met its threshold. Direct and indirect effects were estimated in SmartPLS 4 with 5,000-resample bootstrapping.

Main Findings and Contribution

All four hypotheses were supported: GR affected SP directly ($\beta = 0.215$) and, more strongly, GTA ($\beta = 0.445$), while adoption was the strongest predictor of performance ($\beta = 0.574$). The indirect effect ($\beta = 0.255$) had a bootstrap confidence interval excluding zero and exceeded the direct effect; adoption accounted for 54.2% of the total policy impact, indicating complementary mediation: regulation raises performance mainly by inducing technological change, not administrative compliance.

Originality and Value

The originality lies in a Vietnamese metropolitan setting and in disaggregating regulation into coercive, incentive and guidance instruments. The indirect path's dominance supports technological leapfrogging, as in China's electric-vehicle sector (Zhu et al., 2026); Vietnam's strong but unevenly enforced regime pushes export firms to treat adoption as strategic investment while resource-constrained firms fall back on symbolic compliance.

Research Limitations

The cross-sectional, single-city design limits causal inference and generalisability, inviting longitudinal, multi-city research using objective performance data.

Theoretical and Practical Implications

Theoretically, it enriches institutional theory and the RBV in a transitional economy. Practically, incentive and guidance instruments outperform coercion alone; policymakers should prioritise innovation-led incentives and managers should treat green technology as strategic investment.

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THE STRATEGIC LINK BETWEEN GOVERNMENT REGULATION, GREEN INTELLECTUAL CAPITAL AND GREEN INNOVATION IN PROMOTING SUSTAINABLE PERFORMANCE

Nguyen, Van Phuong [1]; Nguyen, Thi My Huyen[1]; Vrontis, Demetris[2]

[1]Center for Public Administration, International University,
Vietnam National University-Ho Chi Minh City, Ho Chi Minh, Vietnam

[2]Gnosis: Mediterranean Institute for Management Science,
School of Business, University of Nicosia, 2417, Nicosia, Cyprus

Keywords: Government regulation, Green intellectual capital, Green innovation, Sustainable performance, Institutional theory, Emerging markets

Introduction

Under escalating environmental mandates, corporate sustainable transition has shifted from voluntary engagement to a strategic imperative (Singh *et al.*, 2020). Government regulation (GR) represents a vital exogenous force driving structural realignments. However, conventional literature often treats regulation as a monolithic force, overlooking how its multi-dimensional forms trigger strategic reconfigurations (Wu *et al.*, 2024). Furthermore, how internal knowledge and capabilities mediate this transition in emerging markets remains underexplored (Zahid *et al.*, 2024).

Purpose, Aim and Objectives

This study investigates the structural pathways through which multi-dimensional government regulation drives corporate sustainable performance across economic, environmental, and social pillars. Specifically, the objectives are: (1) to evaluate the impact of regulatory dimensions on green intellectual capital (GIC) and green innovation (GI); and (2) to examine the dual-mediating roles of GIC and GI as operational execution buffers translating institutional pressures into superior sustainable performance (SP).

Literature Review and Theoretical Framework

Integrating Institutional Theory and the Natural Resource-Based View (NRBV), this study models a holistic macro-to-micro transmission mechanism. Institutional Theory posits that coercive pressures drive organizational legitimacy (Zahid *et al.*, 2024). Concurrently, NRBV explains how external demands stimulate valuable internal resources specifically GIC and GI

to achieve competitive advantage and sustainable performance (Li *et al.*, 2024). Six hypotheses were developed.

Methodology and Methods

Empirical data were gathered from 487 enterprise managers in an emerging market (N = 487) using 7-point Likert scales. Constructs were operationalized from prior literature: GR from Wu et al. (2024), GIC from Gong and Ribiere (2025), sustainable performance from Lopes Cancela et al. (2024), and GI from Zhang et al. (2025). PLS-SEM was conducted via SmartPLS 4 using a 5,000-resample bootstrapping procedure. Full collinearity VIFs (< 2.09) and measurement metrics confirmed robust reliability and validity without common method bias.

Main Findings and Contribution

PLS-SEM results empirically supported all hypothesized paths. GR positively influences sustainable performance (β = 0.488, p < 0.001), GIC (β = 0.548, p < 0.001), and GI (β = 0.317, p < 0.001). GIC significantly drives GI (β = 0.511, p < 0.001) and sustainable performance (β = 0.207, p < 0.001), while GI directly enhances sustainable performance (β = 0.191, p < 0.001). Mediation analysis confirmed that GI partially mediates the GR sustainable performance link (β = 0.061, p = 0.003) and acts as an operational pipeline unlocking GIC's latent value (β = 0.098, p = 0.002).

Originality and Value

This research reframes government regulation from an administrative burden into a foundational strategic catalyst. By bridging Institutional Theory and NRBV within a unified structural framework, the study explicates the exact operational mechanisms through which macro institutional pressures mobilize intangible green assets and operational technological upgrades to bridge the governance-execution gap and build sustained competitive advantage

Research Limitations

The study relies on a cross-sectional dataset from an emerging market context. Future investigations should employ longitudinal designs and examine boundary conditions, such as digital transformation maturity or market turbulence, as potential moderating factors.

Theoretical and Practical Implications

Theoretically, the findings validate the Porter Hypothesis and demonstrate how regulatory signals stimulate internal resource reconfiguration. Practically, corporate managers should establish regulatory intelligence units to leverage policy incentives, invest in employee ESG upskilling, and prioritize eco-innovations. Policymakers should balance punitive constraint

rules with robust incentive and guiding mechanisms to facilitate collaborative public-private sustainable transitions.

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THE FINANCIALIZATION OF CLIMATE RISK: INSIGHTS FROM A BIBLIOMETRIC ANALYSIS OF THE ACADEMIC LITERATURE

Hyz, Alina[1], Gkikas, Apostolis[2], Gikas, Grigorios[3]

[1]Department of Accounting and Finance, University of West Attica, UniWA, Athens, Greece

[2]Department of Business Administration, University of West Attica, UniWA, Athens, Greece

[3]Department of Business Administration, University of West Attica, UniWA, Athens, Greece

Keywords: Climate risk; Financialization; Financial markets; Bibliometric analysis; ESG; Asset pricing; Financial stability; Systemic risk

Introduction

Climate change is increasingly recognised not only as an environmental externality but also as a financially material source of risk affecting asset prices, market volatility and systemic stability. Over the past decade, climate-related risks have moved to the centre of financial debates, driven by the growing frequency of extreme weather events, the acceleration of climate policies and the expanding role of sustainability considerations in investment and regulatory frameworks (Carney, 2015; Bolton et al., 2020). As a result, climate risk has progressively become an object of financial analysis, pricing and risk management, reflecting a broader process that can be described as the financialization of climate risk (Battiston et al., 2017; BIS, 2021). Rather than treating climate change merely as an environmental issue, the literature increasingly conceptualises climate risk as a financially priced and systemically relevant category embedded in market dynamics.

Purpose, Aim and Objectives

Despite the rapid expansion of research at the intersection of climate change and finance, the literature remains fragmented across disciplines, methodologies and analytical perspectives (Battiston et al., 2021; Campiglio et al., 2023). This study investigates the structural transformation of climate-related research within finance through a bibliometric analysis of publications indexed in the Scopus database.

Methodology and Methods

The analysis employs Bibliometrix (R package) and VOSviewer, including publication

trend analysis, keyword co-occurrence networks, thematic mapping, centrality measures and collaboration network analysis (Aria & Cuccurullo, 2017). The dataset comprises 208 English-language publications published between 2005 and January 2026, including journal articles, books and book chapters.

Findings and Contribution

The findings reveal a pronounced acceleration of scientific production after 2020. Until 2018, publication activity remained sporadic and limited to isolated contributions, whereas the period 2021–2025 exhibits rapid and systematic growth. The highest number of publications was recorded in 2025, with 91 documents, compared to only marginal publication activity during the earlier years of the sample period. This acceleration coincides with heightened regulatory attention, the diffusion of ESG-related disclosures and the growing recognition of climate risk as a potential source of financial instability (FSB, 2017; Bolton et al., 2020). The literature is concentrated within a relatively small group of journals operating at the intersection of finance, energy economics and environmental management. Energy Economics emerges as the leading publication outlet with 14 publications, followed by the Journal of Environmental Management (10 publications), Finance Research Letters (9 publications), Research in International Business and Finance (7 publications) and the International Review of Financial Analysis (6 publications). This distribution reflects both the interdisciplinary character of the field and its growing consolidation within finance-oriented research outlets.

The geographical distribution of scientific production is highly concentrated. China represents the dominant contributor with 149 publications, followed by the United Kingdom (41 publications), the United States (37 publications), France (27 publications) and Italy (22 publications). These countries also occupy central positions in international collaboration networks, functioning as major hubs of knowledge production and dissemination. In contrast, developing economies and climate-vulnerable regions remain underrepresented despite their significant exposure to physical and transition climate risks.

Keyword co-occurrence and thematic analyses reveal a significant conceptual evolution within the literature. Earlier studies primarily framed climate change as a broad environmental and macroeconomic issue, whereas recent research increasingly conceptualises climate risk as an operational, finance-specific construct associated with risk measurement, asset pricing, volatility transmission and systemic stability. Core concepts such as climate change (79 occurrences), climate risk (72 occurrences) and financial markets

(64 occurrences) occupy the most central positions within the keyword network, functioning as integrative nodes connecting different research streams.

Thematic trend analysis demonstrates a transition from event-driven topics, such as COVID-19 and financial crises, toward operational themes related to climate risk assessment, risk management, investments and financial market stability. More recent studies increasingly focus on spillover effects, volatility transmission, portfolio allocation, transition risk and systemic risk, indicating a deeper integration of climate-related considerations into financial decision-making frameworks. At the same time, behavioural and informational dimensions - including investor perception, climate sentiment and climate-related disclosures - are gaining prominence, suggesting that financial markets respond not only to objective climate exposures but also to how climate risk is interpreted and communicated.

From a practical perspective, the findings indicate that climate risk is increasingly treated as a core component of financial risk management and macroprudential supervision. The growing concentration of research around systemic risk, stress testing and climate risk assessment reflects a broader shift toward integrated approaches to portfolio risk evaluation and financial stability monitoring. At the same time, the identified geographical concentration of the literature highlights the need for more empirical evidence from emerging and climate-vulnerable economies, where financial systems may face disproportionate exposure to physical and transition risks.

Overall, the findings illustrate how climate risk has evolved from a peripheral environmental concern into a financially material risk category embedded in asset pricing, volatility transmission and financial stability debates. The analysis demonstrates a clear paradigm shift from traditional environmental economics toward integrated analyses of climate risk within the financial system. These findings confirm the growing integration of climate risk into mainstream financial research and highlight the need for more geographically diversified and theoretically integrated future studies focusing on cross-market transmission mechanisms, climate risk pricing and macro-financial stability.

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WHY GREEN HRM STRUGGLES: BARRIERS, BEHAVIOURAL MECHANISMS AND INSTITUTIONAL DRIVERS IN GREECE

Gkikas, Apostolis[1]; Salmon, Ioannis[2]

[1] Department of Business Administration, University of West Attica, Athens, Greece

[2] Department of Business Administration, University of West Attica, Athens, Greece

Keywords: Green HRM, environmental consciousness, green behaviour, organisational barriers, regulatory pressure, institutional drivers, environmental performance, CSR.

Abstract

Human Resource Management (HRM) is widely recognised as a core organisational function shaping employee attitudes, behaviour and firm performance. Within the sustainability agenda, Green Human Resource Management (GHRM) extends traditional HR practices, such as recruitment, training, performance appraisal, rewards and employee involvement, by embedding environmental criteria and pro-environmental values into the employee lifecycle. Through this integration, GHRM aims to align human capital management with environmental strategy and enhance organisational environmental performance by fostering employees' green behaviour. Despite its growing prominence in academic and policy debates, empirical evidence suggests that GHRM adoption remains uneven, fragmented and frequently symbolic across countries and sectors. This challenge appears particularly pronounced in contexts such as Greece, where environmental initiatives often lack strategic coherence and depth.

The present study addresses this issue by examining the perceived level of GHRM implementation in Greek organisations, the behavioural mechanisms through which GHRM translates into employees' green behaviour, and the role of internal organisational barriers and external institutional drivers in shaping GHRM adoption. The aim of this study is to explain how GHRM influences employee green behaviour and environmental performance, and to identify the organisational and institutional factors that constrain its effective and systematic implementation.

Drawing on the Green HRM literature, the study conceptualises GHRM as a set of HR practices that signal environmental priorities and foster pro-environmental behaviour at work. Prior research suggests that these practices influence employee outcomes mainly through psychological mechanisms, particularly environmental consciousness, which acts as a key behavioural mechanism linking HR practices with employee behaviour. From an institutional perspective, in contexts characterised by regulatory fragmentation and weak market pressure,

such as Greece, GHRM is often adopted in response to external drivers, leading to symbolic rather than substantively integrated implementation.

Empirically, the study is based on a quantitative survey conducted among employees working in Greek organisations across the public and private sectors (N = 604). Data were collected using a structured questionnaire with validated multi-item scales measured on seven-point Likert scales. The survey captured employees' perceptions of GHRM practices, environmental consciousness, in-role and extra-role green behaviour, organisational barriers to GHRM implementation, and external institutional factors, including regulatory pressure, state incentives, customer/social pressure and competitive pressure, as well as perceived CSR and environmental performance. The data were analysed using descriptive statistics, confirmatory factor analysis, structural equation modelling and moderation analysis.

The findings indicate that GHRM practices in Greece are perceived at a moderate-to-low level, pointing to limited institutionalisation and fragmented implementation. At the same time, employees report relatively high levels of environmental consciousness and green behaviour, suggesting a gap between individual environmental orientation and the systematic integration of green HRM practices within organisations.

Importantly, GHRM influences employee outcomes both directly and indirectly. GHRM has a positive and statistically significant effect on environmental consciousness ($\beta = 0.301$, $p < 0.01$), which in turn strongly predicts in-role green behaviour ($\beta = 0.471$, $p < 0.01$) and, to a lesser extent, extra-role behaviour ($\beta = 0.258$, $p < 0.01$). In addition, GHRM exerts a strong direct effect on environmental performance ($\beta = 0.641$, $p < 0.01$), confirming its central role in shaping sustainability outcomes.

The analysis also explains why GHRM remains constrained in practice. Organisational barriers, such as weak strategic planning, limited financial and human resources and insufficient managerial support, are negatively associated with environmental performance ($b = -0.08$, $p < 0.05$), although they do not significantly moderate the relationship between GHRM and environmental performance. In contrast, external institutional drivers play a more decisive role. Regulatory pressure not only acts as a direct driver but also significantly strengthens the relationship between GHRM and environmental performance (interaction effect: $b = 0.10$, $p < 0.001$). Regulatory pressure and state-provided incentives emerge as stronger drivers than market- or customer-based pressures, suggesting that GHRM in Greece is often externally driven rather than deeply embedded within organisational systems.

Furthermore, GHRM is positively associated with perceived CSR and environmental performance, indicating that even uneven implementation may contribute to organisational

legitimacy and sustainability signalling. Overall, the study contributes to the Green HRM literature by explaining how GHRM translates into employee behaviour and why this process remains constrained in practice. It highlights the central role of environmental consciousness and underscores the importance of moving beyond compliance-driven approaches towards more strategically integrated GHRM systems.

The cross-sectional nature of the data represents a limitation, indicating that future research could employ longitudinal and multi-source designs to further explore the dynamic interaction between institutional drivers, organisational practices and employee behaviour.

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AIRPORT PLATFORMISATION AND THE STRATEGIC TENSION OVER AIRLINE CUSTOMER INTERFACE OWNERSHIP

Raggi, Carlo Riccardo[1]; Remondino, Marco[1]

[1]Department of Economics and Business Studies, University of Genoa, Genoa, Italy

Keywords: Airport 5.0; Airport platformisation; Aviation ecosystems; Customer interface ownership; Platform dependency; Platform governance; Service-Dominant Logic; Strategic tension.

Purpose: This paper investigates the strategic implications of airport digital platformisation for airlines within the aviation ecosystem. It examines how Airport 5.0 infrastructures and airport-managed digital platforms reshape control over passenger relationships and value co-creation processes, shifting competitive dynamics from customer ownership to control over access and interaction.

Literature review and theoretical framework: The study integrates three distinct research streams: airport digitalisation, airline modern retailing, and service ecosystem theory. Grounded in Service-Dominant Logic (SDL) and Platform Ecosystem Theory, the analysis conceptualises the passenger journey as a platform-mediated environment and highlights the emerging tension between airline transactional ownership and airport contextual control.

Methodology: A conceptual research design is adopted, following a theory synthesis approach. The study employs abductive reasoning, combining established management theories with recent industry evidence from 2022 to 2026. The synthesis is based on a bounded selection of academic and industry sources across airport digitalisation, airline modern retailing and platform/service ecosystem theory.

Main findings and contribution: The paper develops five theoretical propositions explaining how airport platformisation redistributes power within the aviation ecosystem. It introduces the concept of platform-mediated customer interface ownership and argues that airlines may face increasing platform dependency as airports capture real-time contextual data through biometric and proximity-based touchpoints. The study further suggests that competitive advantage is increasingly shaped by the governance of access to customer interactions, rather than by ownership of customer data alone.

Originality and value: This research bridges airport management and airline retailing literature by offering an ecosystem-level perspective on digital transformation. It contributes to platform governance theory by reframing customer ownership as a function of access control within spatially bounded digital environments and provides managerial insights for navigating the structural tensions of platformised aviation ecosystems.

Introduction

The aviation industry is undergoing a phase in which digital transformation is no longer only associated with operational efficiency, but also with changing relationships among actors in the aviation ecosystem. While the last decade was characterised by the adoption of discrete technologies, ranging from big data analytics to biometric identification, the current phase is increasingly shaped by integrated digital platforms that mediate multiple stages of the passenger journey. This shift does not simply automate existing processes. It also changes the organisational and economic conditions under which airports, airlines and passengers interact, giving rise to a contest over the ownership of the passenger relationship.

Historically, the distribution of roles was relatively clear: airports acted as asset-heavy infrastructure providers, while airlines were the primary owners of the customer relationship, controlling the transactional flow from ticket sale to loyalty management. However, the emergence of the Airport 5.0 paradigm (Šváb & Čikovský, 2025) challenges this equilibrium. Modern airports are evolving into data-driven service environments, in which technologies such as Internet of Things (IoT) sensors, digital twins and artificial intelligence support operational coordination, passenger-flow management and increasingly personalised interactions (Halpern et al., 2021; Sepasgozar, 2021).

In parallel, airlines are undergoing their own transformation toward a modern retailing model (IATA, 2025). Facing demand volatility and intense competition, carriers are shifting from transportation providers to digitally enabled retail organisations. Strategic investments in direct distribution, such as New Distribution Capability (NDC), and customer-centric platforms aim to consolidate their relationship with passengers through personalised offers and dynamic pricing (Lufthansa Group, 2024). Yet, this ambition for direct customer ownership is increasingly constrained by the physical and digital reality of the airport environment. As passengers move through the terminal, they are embedded in an integrated digital layer, managed by the airport, that mediates access to information, navigation and, increasingly, commercial services (Kontogiannis, 2024).

This convergence of digital strategies creates a strategic paradox. While airlines aim to strengthen their direct relationship with the traveller, airports are increasingly deploying Customer Relationship Management (CRM) systems and digital touchpoints that allow them to extend their influence over the end-to-end passenger journey (Rubinstein, 2025). The airport is no longer only a physical node, but also a platformised service environment where visibility and customer access are governed through digital infrastructures. As a result, the airline's strategic autonomy may become conditioned by the airport's platform layer, a condition associated with platform dependency (Cutolo & Kenney, 2021).

Similar dynamics have been observed in other platform-based industries, where control over customer access has shifted from traditional service providers to digital intermediaries. However, the aviation industry presents a distinctive case, as digital intermediation is embedded within a physical and spatially constrained environment. This makes the redistribution of customer control particularly complex and theoretically relevant.

From a theoretical perspective, these shifts can be examined through Service-Dominant Logic (SDL) and Service Ecosystem Theory. In an SDL framework, value is not delivered by a single firm, but co-created through the integration of resources among multiple actors, including airports, airlines and passengers (Vargo & Lusch, 2008). In this context, digital platforms operate as institutional arrangements that may facilitate, mediate or constrain resource integration. However, current literature remains fragmented. Research on airport digitalisation has primarily privileged the operator's perspective on operational excellence (Šváb & Čikovský, 2025), while airline research has focused on distribution transformation. Limited attention has been paid to the ecosystem-level implications of platformisation, particularly regarding control over the customer interface.

The analysis moves beyond a descriptive account of smart airports to theorise the strategic tension between airport-led platform mediation and airline-driven customer ownership. This is particularly relevant in the post-pandemic era, where the push for seamless and contactless travel has accelerated the development of contactless and biometric passenger-processing systems, increasing the importance of data generated within airport-controlled environments (Miyamoto, 2022).

Accordingly, the study addresses the following research question:

How do airport-managed digital platforms reshape airlines' control over passenger relationships and value creation within aviation ecosystems?

The scope of this paper is primarily concerned with digitally advanced international airports and major hub environments, where airport-managed platforms, biometric infrastructures, passenger-facing applications, real-time data systems and integrated commercial touchpoints are sufficiently developed to mediate the passenger journey. The framework is particularly relevant for full-service and network airlines pursuing modern retailing, direct distribution, loyalty integration and customer personalisation strategies. It is less directly applicable to small regional airports, low-digitalisation airport environments or ultra-low-cost carrier models where customer interaction is intentionally reduced, standardised or disintermediated.

By addressing this question, the paper makes three contributions. First, it connects the previously siloed streams of airport digitalisation and airline modern retailing through an ecosystem-level

perspective on passenger experience governance, while also offering implications for holistic customer experience management in aviation contexts. Second, it extends platform governance theory by introducing the distinction between contextual and transactional ownership, explaining how power is redistributed in spatially bounded digital environments. Third, it offers managerial insights for aviation executives by showing that competitive advantage increasingly depends not only on owning the passenger relationship, but also on governing access to platform-mediated customer interactions.

Literature Review

The evolution toward Airport 5.0 and digital sovereignty

The digital transformation of aviation has moved beyond the adoption of isolated information systems toward a broader reconfiguration of airport infrastructure and service processes. The transition from the automation-oriented Airport 4.0 model to the Airport 5.0 paradigm is associated with the integration of self-service technologies, biometric identification and Internet of Things (IoT) applications into more connected operational environments (Šváb & Čikovský, 2025). This transition is also supported by the deployment of digital twins, understood as dynamic representations of physical assets that enable monitoring, simulation and more predictive forms of infrastructure management (Sepasgozar, 2021).

Recent studies indicate that these technologies can affect how airports manage operations, passenger flows and service quality. For instance, pilot-scale evidence from Athens International Airport shows how AI-powered service robots, 5G connectivity and thermal imaging can support passenger-flow management and operational responsiveness (Giannopoulou et al., 2026). While such evidence should not be generalised to all airport contexts, it illustrates how digitally advanced airports are developing a new informational layer around the passenger journey. In this context, airports are not only physical infrastructure providers, but increasingly platform actors that govern data, interfaces and passenger-facing interactions.

Modern airline retailing and the quest for direct ownership

In parallel, airlines are rethinking their retail approach in response to commoditisation, demand volatility and pressure on margins. The transition toward Modern Airline Retailing (MAR) seeks to move beyond legacy fulfilment processes and records, such as Passenger Name Records (PNRs) and electronic tickets, towards a more integrated model based on offers and orders (BCG and IATA, 2022; IATA, 2025).

This shift reflects airlines' effort to develop real-time, customised product bundling and more direct customer engagement.

The Lufthansa Group (2024) exemplifies this direction through initiatives such as the Digital Hangar and Lufthansa Group Travel ID, which seek to strengthen data-driven personalisation and customer relationship continuity. By investing in direct distribution channels and customer-centric platforms, airlines aim to reduce dependence on traditional intermediaries such as Global Distribution Systems (GDS). However, the airport terminal is becoming a further site of digital intermediation. As airlines seek to consolidate the direct relationship with the passenger, airports increasingly shape the physical and digital environment in which many customer interactions occur.

Airport platformisation: the new intermediary

As airports adopt digital passenger experience platforms, they are increasingly able to mediate interactions among airlines, retailers and travellers. From a platform ecosystem perspective, this does not necessarily mean that airports become platforms in the same way as purely digital firms. Rather, airports increasingly perform platform-like functions by structuring access, visibility and interaction within a spatially bounded service environment (Gawer, 2014; Jacobides et al., 2018).

These platforms may integrate information, navigation, security-related processes and commercial services into more unified passenger-facing interfaces. Biometric recognition and contactless processing further reinforce this development by embedding passenger identification and movement within airport-managed digital systems (Miyamoto, 2022). In this setting, airports can influence parts of the passenger relationship that were historically more closely associated with airlines, especially during dwell time and terminal-based interactions.

The integration of airport-managed CRM systems also supports this shift. Rubinstein (2025) argues that CRM can help airports enhance passenger engagement, support revenue generation and strengthen the airport-customer relationship. This development may create a condition of platform dependency for airlines, particularly when carriers rely on airport-controlled interfaces, data flows or commercial touchpoints to reach passengers during key moments of the journey (Cutolo & Kenney, 2021). In such cases, airlines do not lose the customer relationship altogether, but their ability to activate it becomes partly conditioned by the airport's platform layer.

Service ecosystems and the paradox of value co-creation

Service-Dominant Logic shifts the analytical focus from the exchange of products or services to the way actors integrate resources to co-create value within a broader ecosystem. This perspective is particularly useful for aviation because the passenger experience is not produced by one actor alone,

but emerges from the coordinated interaction of airlines, airports, retailers, technology providers and passengers.

Viewed through the lens of Service-Dominant Logic (SDL), the aviation industry can be understood as a service ecosystem in which value is co-created through the integration of resources among multiple actors (Vargo & Lusch, 2004, 2008). In this setting, digital platforms operate as institutional arrangements that may facilitate, mediate or constrain service-for-service exchanges (Gawer, 2014). They can improve coordination, but they can also generate tensions when airport platform goals and airline retailing objectives are not aligned.

Misalignment between actors may degrade the passenger experience and generate forms of value co-destruction, particularly when digital responsibilities, customer-facing interfaces and data flows are not coordinated. Recent customer experience frameworks further emphasise the managerial importance of breaking down operational silos through cross-functional governance and closed-loop feedback. However, in this paper, the core theoretical basis of value co-creation and potential value co-destruction remains grounded in Service-Dominant Logic and platform ecosystem theory, while holistic customer experience management is used only as a complementary managerial lens.

Taken together, existing studies provide valuable insights into digital transformation in aviation, but remain fragmented across domains. Airport research has largely focused on operational and experiential improvements, while airline research has emphasised retailing and distribution. Less attention has been paid to the interaction between airport platformisation and airline customer strategies, particularly in relation to control over customer interfaces.

Research Approach

Research design: conceptual synthesis

This study adopts a conceptual research design based on theory synthesis (Jaakkola, 2020). This approach is suitable for the present topic because empirical evidence on airport platformisation remains fragmented and relevant explanations are dispersed across different research streams. Rather than offering a descriptive review of a single literature, theory synthesis connects previously separate bodies of knowledge in order to develop new conceptual relationships.

In this paper, airport digitalisation, airline modern retailing and platform/service ecosystem theory are recombined to explain how control over the passenger interface is redistributed in platformised aviation ecosystems. The design differs from a standard narrative literature review because the purpose is not simply to summarise existing knowledge, but to use selected literatures to build an integrative explanation of a specific strategic tension in aviation.

Theoretical foundations

The analysis is constructed around two theoretical perspectives: Service-Dominant Logic and Platform Ecosystem Theory.

- Service-Dominant Logic: Drawing on Vargo and Lusch (2004, 2008), value is conceptualised as value-in-use, co-created through the integration of resources among multiple actors. This perspective is useful for analysing how digital touchpoints may facilitate or constrain value formation within the terminal environment.
- Platform Ecosystem Theory: Following Gawer (2014) and Jacobides et al. (2018), airports are interpreted as platform-like actors that structure interactions among airlines, retailers, passengers and other ecosystem participants. This perspective supports the analysis of power redistribution, as airlines' strategic autonomy may become conditioned by the digital and physical infrastructure managed by the airport.

Literature selection and integration strategy

To support the conceptual synthesis, the study relied on a purposive and iterative selection of academic and industry sources rather than a systematic literature review protocol. The objective was not to map exhaustively all publications on airport digitalisation or airline retailing, but to identify theoretically relevant contributions capable of explaining customer-interface control in platformised aviation ecosystems.

The selection was organised around three domains central to the research question: airport digitalisation and smart airport studies; airline modern retailing and distribution transformation; and platform/service ecosystem theory. It focused mainly on publications and industry evidence produced between 2018 and 2026, while earlier seminal contributions were retained when they provided foundational concepts, particularly in Service-Dominant Logic and platform ecosystem theory.

Academic sources were included when they addressed digital transformation in airports, airline customer relationship strategies, platform governance, platform dependency, Service-Dominant Logic or service ecosystem perspectives. Industry and corporate sources were included when they provided recent evidence of strategic developments in airline retailing, biometric passenger processing, customer platforms or airport-managed digital infrastructures. Sources were excluded when they focused exclusively on technical engineering performance without managerial relevance, general transport digitalisation without airport or airline implications, or passenger satisfaction without addressing digital mediation, governance or customer-interface control.

Overall, the synthesis draws on a focused set of core academic, conceptual and industry sources. Industry sources, including IATA, BCG and Lufthansa Group, are used as contextual evidence of

strategic direction rather than as neutral empirical validation. Their commercial and institutional nature is acknowledged, and their claims are interpreted in conjunction with peer-reviewed theoretical literature.

Scope and boundary conditions

The framework is bounded in three respects. First, it primarily applies to digitally advanced international airports and major hubs where passenger-facing digital platforms, biometric systems, real-time data infrastructures and commercial touchpoints are sufficiently developed to mediate the passenger journey. Second, it is most relevant for full-service and network airlines pursuing modern retailing, direct distribution, loyalty integration and personalised customer engagement. Third, it is temporally situated in the 2022–2026 period, during which post-pandemic digital acceleration, biometric processing and modern airline retailing became increasingly prominent in aviation strategy. The framework is not intended to explain all airport-airline relationships, but the specific tension that emerges when both airports and airlines seek to govern the same passenger interface through digital platforms.

Conceptual Framework and Propositions

From physical infrastructure to platform mediation

The digital transformation of aviation is altering the position of the airport within the industry value chain. The transition towards the Airport 5.0 paradigm reflects a shift from the provision of physical space toward the ability to design and govern the digital conditions under which passenger interactions occur. Through digital twins and predictive simulation, airports can move from reactive operational handling toward more anticipatory forms of passenger-flow management. Evidence from recent technological trials illustrates how digitally advanced airports may use AI-enabled systems, connectivity and sensing technologies to support passenger-flow management and operational responsiveness (Giannopoulou et al., 2026). This transition does not remove the infrastructural role of the airport, but adds a platform-mediated layer through which passenger visibility, movement and interaction can be shaped.

Customer interface ownership as a strategic resource

Customer interface ownership refers to the capacity to control the primary touchpoints through which passengers interact with a brand or service provider. For airlines, this has traditionally been linked to ticket ownership, loyalty programmes, direct channels and retailing platforms. However, this form of

transactional control is increasingly challenged by the spatial and digital reality of the terminal. While airlines seek to maintain a direct relationship through initiatives such as digital travel identities and modern retailing platforms, passengers are also embedded in an airport-managed digital environment during dwell time. A tension emerges between the airline's transactional control, derived from ticketing and retailing systems, and the airport's contextual control, rooted in the management of physical and digital interactions during the journey.

Platform mediation and the redistribution of power

Airport-managed digital platforms introduce a layer of mediation between airlines, retailers and passengers. This mediation is important because influence is increasingly linked to the control of contextual, proximity-based and behavioural data. While airlines have historically held customer data through booking systems and loyalty programmes, airports can generate contextual data through biometric, location-based and passenger-facing touchpoints (Miyamoto, 2022). Combined with airport-managed CRM systems, these data flows may allow airports to influence passenger engagement and commercial interaction within the terminal. This reconfiguration suggests a condition of platform dependency for airlines: the carrier remains responsible for the transportation service, but its ability to reach the passenger during high-value moments of the journey may be partly conditioned by the airport's platform layer (Cutolo & Kenney, 2021).

Reconfiguring value co-creation through digital platforms

In platformised aviation ecosystems, co-creation is increasingly mediated by digital infrastructure. Drawing on platform ecosystem theory, the airport platform can be understood as an architecture that structures interactions between airlines, retailers and travellers. This mediation alters the process of value formation because actors that govern the platform and its data pipelines are positioned to influence how resources are integrated. Passengers also contribute to this process by generating data through movement, identification and interaction within the airport environment (Vargo & Lusch, 2016; Kontogiannis, 2024). The effectiveness of this co-creation depends on institutional alignment. Misalignment between actors can degrade the passenger experience and generate forms of value co-destruction, particularly when digital responsibilities, customer-facing interfaces and data flows are not coordinated.

The strategic tension: platform mediation versus ownership

The relationship between airport platformisation and airline retail transformation generates a structural tension. Airports seek to expand their role in governing passenger-facing interfaces, while airlines aim to protect their direct channels and maintain a distinctive brand relationship with the passenger (BCG and IATA, 2022). Both actors may benefit from improved data accuracy and more integrated processes, but they may also compete over control of the customer interface. Without integrated governance, overlapping digital signals, fragmented responsibilities and competing interface logics may diminish passenger trust and satisfaction.

Conceptual model and propositions

The proposed conceptual model identifies a shifting equilibrium between airport contextual control and airline transactional ownership. The following five propositions summarise the theoretical relationships developed in the paper:

Proposition 1: In digitally advanced hub airports, airport platformisation expands the scope of managed passenger touchpoints, shifting the airport's role from physical infrastructure provider to a platform actor capable of governing passenger-facing interactions.

Proposition 2: The more airlines rely on airport-controlled digital and physical touchpoints during the passenger journey, the more their modern retailing strategies are constrained by the airport's platform architecture.

Proposition 3: Platform dependency is likely to be stronger when airlines lack direct access to real-time contextual data or when data-sharing arrangements between airports and airlines are weak, asymmetric or commercially contested.

Proposition 4: The greater the airport's ability to capture and recombine contextual, biometric, location-based and behavioural data, the greater its capacity to mediate customer-interface ownership and influence value capture.

Proposition 5: The risk of value co-destruction increases when airport and airline digital strategies are not supported by shared governance rules, interoperable systems or Digital Service Level Agreements.

The theoretical relationships outlined in these propositions are synthesised in Figure 1, which illustrates the shifting equilibrium between transactional and contextual control within the aviation service ecosystem.

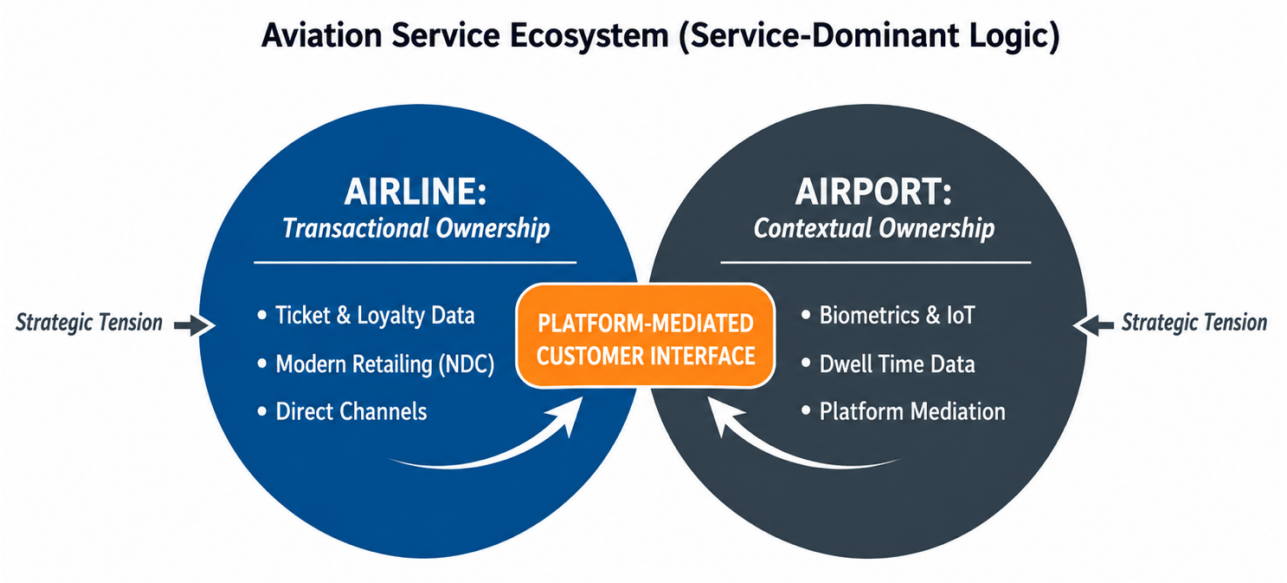


Figure 1: Conceptual Framework of Platform-Mediated Customer Interface Ownership in Aviation Ecosystems. (Source: Authors' own elaboration)

The following section discusses how this reconfiguration affects the competitive strategies of airlines and airports.

Discussion and Implications

The conceptual framework synthesised in Figure 1 shows how the boundaries of customer ownership in aviation are being redefined. While the literature on airline retailing has mainly focused on direct customer engagement through digital channels, this study suggests that such strategies are increasingly mediated by the airport's digital infrastructure. The model highlights a shift from transactional sovereignty, anchored in the flight contract and loyalty data, to contextual sovereignty, derived from the management of the physical-digital journey within the terminal. As airports transition toward the Airport 5.0 paradigm, the platform-mediated customer interface becomes a central site of airline-airport competition, moving the industry toward a triadic relationship in which the airport operator gains increasing influence over the digital conditions of passenger interaction.

Theoretical Implications

This study advances existing literature by shifting attention from technology adoption to the governance of interactional architectures within the aviation ecosystem. The contribution should be understood as an extension and recombination of existing theoretical perspectives, rather than as the introduction of an entirely new theory. Its value lies in connecting Service-Dominant Logic, platform

ecosystem theory and airline retailing debates to explain how customer ownership is reconfigured when passenger interactions are mediated by airport-controlled digital infrastructures.

By introducing the concept of platform-mediated customer interface ownership, the study contributes to Service-Dominant Logic by showing that digital infrastructures are not neutral enablers, but strategic mediators of value formation. These platforms may introduce informational asymmetries, as the actor controlling the platform layer captures granular, real-time contextual data that may remain partly inaccessible to the primary service provider. The framework also identifies a structural tension: technologies designed to support ecosystem coordination, such as digital twins and biometric systems, may also enable forms of competitive gatekeeping. In this sense, ecosystem influence is increasingly exercised through the governance of data standards, platform access and digital touchpoints.

Managerial Implications for Airlines

For airline executives, the framework indicates that direct-to-consumer ambitions are increasingly bounded by the airport's platform layer. To maintain relationship continuity, airlines need to ensure that their digital presence is not only parallel to, but also interoperable with, the terminal's platform environment. Investments in modern retailing may lose part of their strategic value if carriers remain dependent on airport-managed interfaces for the contextual delivery of personalised offers. Beyond control over the customer interface, this shift has direct revenue implications: as airports increasingly mediate high-value touchpoints during dwell time, airlines risk losing visibility over ancillary revenue opportunities and personalised upselling, potentially weakening their ability to capture customer lifetime value.

This issue is particularly relevant for ancillary revenue strategies. If the airport controls the digital layer through which passengers receive real-time information, navigation support, retail recommendations and service prompts during dwell time, it can influence not only what passengers see, but also when and through which interface they see it. This may weaken the airline's ability to monetise upgrades, lounge access, fast-track services, baggage options, seat selection, insurance products or bundled offers at the moment when passengers are most receptive to contextual purchasing decisions. The strategic risk for airlines is not limited to data access, but extends to the loss of commercial visibility during high-value moments of the passenger journey.

To mitigate the risk of becoming commoditised capacity providers, airlines should pursue collaborative data-sharing arrangements and stronger institutional alignment with airports. Such cooperation is needed to reduce the risk of value co-destruction and to ensure that overlapping or conflicting digital signals do not degrade the passenger experience.

Implications for Governance and Regulation

As airports deploy increasingly advanced AI-powered systems to prioritise passenger interactions, the transparency of algorithmic prioritisation becomes a relevant governance concern. The findings suggest that future airport-airline agreements may evolve beyond traditional physical access rights toward Digital Service Level Agreements (DSLAs). These agreements would extend airport-airline governance beyond physical access, operational slots and service standards, incorporating the governance of digital interaction rights.

DSLAs could define which actor has access to real-time passenger data, under what conditions contextual information can be shared, how biometric and location-based data are governed, and how competing customer-facing messages are prioritised across airport and airline interfaces. They could also establish interoperability standards, API access rules, responsibilities for data accuracy, procedures for resolving conflicting digital communications, and principles for revenue-sharing when airport-controlled interfaces contribute to airline ancillary sales or vice versa. At the same time, DSLAs would raise complex governance challenges, including data protection compliance, commercial confidentiality, algorithmic transparency and the possibility that airports with strong platform control may impose asymmetric conditions on airline partners. Ultimately, the sustainability of the aviation ecosystem will depend on whether these digital interfaces are managed as exclusive competitive assets or as shared infrastructures for collective value co-creation.

Conclusion

Synthesis of Contribution

This research has theorised a significant shift in the aviation power structure: the movement from transactional to contextual sovereignty. While airlines have historically anchored their customer relationship to the flight contract, the rise of the platformised airport allows the infrastructure operator to extend its influence over the passenger journey through digital interfaces that operate before, during and after terminal dwell time.

The core contribution of this study lies in the conceptualisation of platform-mediated customer interface ownership. Rather than proposing an entirely new theory, the paper extends and recombines existing perspectives on Service-Dominant Logic, platform ecosystems and airline retailing to explain a specific aviation management problem: the redistribution of customer-interface control within digitally mediated airport environments.

It argues that, in the Airport 5.0 era, the traditional airline-passenger dyad is increasingly complemented by a triadic relationship in which the airport becomes an influential actor in governing the passenger interface. This evolution presents airlines with a strategic paradox: their investments in

Modern Retailing and NDC may be physically and digitally bounded by the infrastructure within which key passenger interactions occur. The sustainability of the aviation ecosystem will depend on moving beyond competitive gatekeeping toward coordinated governance models capable of limiting value co-destruction and supporting shared value creation.

Limitations, Future Research Directions and Closing Remarks

The conceptual nature of this study requires further empirical validation. Future research should develop case studies of major international hubs that have integrated biometric platforms, passenger-facing applications and airport-managed digital infrastructures, examining how these systems affect airlines' ability to engage passengers and generate ancillary revenue.

Further research should also investigate how airport digital mediation influences airline brand loyalty over time. In particular, future studies could examine whether a seamless journey managed primarily through airport interfaces contributes to the progressive commoditisation of the flight service, or whether airline brands can retain distinctiveness through integrated digital strategies. Finally, the evolution of data architectures calls for further analysis of how real-time information flows are governed, monetised and shared among actors within the aviation ecosystem.

The future of competition in aviation will not be determined solely by which actor owns the customer record, the ticket or the loyalty account, but by which actor governs the interfaces through which passengers access, interpret and act upon travel-related services. In platformised aviation ecosystems, customer ownership is increasingly a question of governed access rather than formal possession.

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THE BRAND OF CORFU UNDER THE LENS OF OVERTOURISM: ECONOMIC PRESSURES AND STRATEGIES FOR SUSTAINABLE RESTRUCTURING

Ioannidi, Maria[1]; Tsoukatos, Evagelos[2]; Epaminonda, Nondas[3]; Repousis, Spyros[4]

[1]School of Business, University of Nicosia, Nicosia, Cyprus

[2]School of Business, University of Nicosia, Nicosia, Cyprus

[3]School of Business, University of Nicosia, Nicosia, Cyprus

[4]School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Overtourism, Place Branding, Authenticity, Resident Perceptions, Sustainable Tourism, Corfu, Destination Image

Introduction

Overtourism has become a major challenge for mature island destinations where visitor numbers exceed social and environmental carrying capacity. While tourism generates substantial economic benefits, it may also create congestion, infrastructure pressure and declining resident satisfaction. Because destination brands are shaped by local experiences and stakeholder perceptions, understanding the effects of overtourism on destination image is increasingly important. This study focuses on Corfu, a leading Greek tourism destination.

Purpose, Aim and Objectives

The study investigates the relationship between perceived overtourism, authenticity and destination branding in Corfu. It assesses how overtourism influences resident and stakeholder perceptions, examines the impact of authenticity on destination image and explores whether economic dependence on tourism affects support for sustainable tourism policies.

Literature Review and Theoretical Framework

The research integrates overtourism, resident perception and place-branding literature. Overtourism refers to tourism activity exceeding a destination's social and environmental capacity (Koens et al., 2018; Milano et al., 2019). Resident perception theories explain changing attitudes towards tourism growth, while place-branding studies emphasise authenticity and stakeholder participation as key determinants of destination identity (Melewar & Skinner, 2020). Limited research has combined these perspectives within Mediterranean island destinations.

Methodology and Methods

A quantitative design was adopted. Data were collected through a structured questionnaire from 208 participants, comprising 104 residents and 104 local stakeholders in Corfu. Variables included perceived overtourism, authenticity, economic perceptions, destination image and support for sustainability policies. Descriptive statistics, correlation analysis and linear regression were employed.

Main Findings and Contribution

The findings reveal a significant relationship between perceived overtourism and negative evaluations of Corfu's destination brand. Higher perceptions of congestion and infrastructure pressure are associated with less favourable assessments of destination image. Residents reported more critical views than stakeholders, highlighting the importance of lived experience. Authenticity emerged as the strongest predictor of destination image. The study contributes by empirically linking overtourism, social perceptions and place branding.

Originality and Value

The study proposes an integrative framework connecting overtourism and destination branding through local perceptions. By demonstrating how social experiences influence destination image, it extends current knowledge and provides a foundation for future comparative research.

Research Limitations

The findings are constrained by the cross-sectional design, self-reported measures and focus on a single destination, which may limit generalisability.

Theoretical and Practical Applications and Implications

The research advances place-branding theory by incorporating social sustainability and resident perspectives. Practically, destination managers should align branding strategies with local experiences, preserve authenticity and strengthen stakeholder engagement to support long-term destination resilience.

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HUMAN RESOURCE MATURITY AND THE TWIN TRANSITION IN PUBLIC SERVICES. EMPIRICAL EVIDENCE FROM GREECE

Liaskopoulou, Aikaterini[1]; Papadopoulos, Ioannis[1]; Vrontis, Demetris[2]

[1]Department of Forestry, Wood Sciences and Design, School of Technology, University of Thessaly, Karditsa, Greece

[2]School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Green Transition, Digital Transformation, Human Resource Maturity, Green Human Resource Management, Public Services, Organisational Change

Introduction

The twin green and digital transition is reshaping public services by combining environmental requirements with new technologies, data practices and organisational processes. Yet transformation cannot be achieved through technology and regulation alone. Its success depends on employees' ability to learn, remain committed and sustain performance under overlapping reform demands. Digital transformation involves strategy, processes, capabilities and culture (Vial, 2019; Verhoef et al., 2021), while Green Human Resource Management (Green HRM) can support participation, learning and environmentally responsible behaviour (Renwick et al., 2013).

Purpose, Aim and Objectives

This study examines human resource maturity as an integrative adaptive capability in the twin transition of public services. It investigates whether Green HRM, perceived digital maturity, organisational barriers and managerial support shape human resource maturity and whether maturity differs across employee groups.

Literature Review and Theoretical Framework

Human resource maturity is conceptualised as a broader capability than readiness alone, combining commitment to change, learning capacity, behavioural adaptation and sustained performance. Organisational readiness for change theory emphasises shared commitment and confidence in implementation capacity (Weiner, 2009), while the Job Demands-Resources (JD-R) framework explains adaptation through the balance between demands and organisational resources (Bakker and Demerouti, 2017). Green HRM and digital maturity are therefore treated as organisational resources, whereas resource shortages and administrative constraints intensify transformation demands.

Methodology and Methods

A quantitative cross-sectional survey was conducted among 232 employees of environmentally oriented public services in Greece. Data were collected through an anonymous questionnaire using five-point Likert scales. Human resource maturity was measured as a composite capability incorporating commitment, acceptance of change, learning and the ability to maintain performance under intensified green and digital demands. Cronbach's alpha values were 0.79-0.86 for the individual dimensions and 0.88 for the composite maturity index. Analysis included descriptive statistics, Pearson correlations, group-difference tests and multiple linear regression.

Findings and Contribution

Organisational barriers recorded the highest mean ($M = 3.98$), while human resource maturity reached $M = 3.29$. Green HRM ($r = 0.56$, $p < 0.01$) and digital maturity ($r = 0.61$, $p < 0.01$) were positively associated with maturity, whereas organisational barriers were negatively associated ($r = -0.48$, $p < 0.01$). In the regression model, digital maturity was the strongest positive predictor ($b = 0.34$), followed by Green HRM ($b = 0.29$) and managerial support ($b = 0.26$), while organisational barriers had a negative effect ($b = -0.21$); all effects were significant at $p < 0.001$. The model explained 52% of the variance in human resource maturity. Significant differences were also observed by gender, age and education.

Originality and Value

The study positions human resource maturity as a human-centred mechanism linking twin-transition pressures with sustainable organisational adaptation. It extends readiness-based perspectives by emphasising the continuing capacity to learn, adapt and perform under simultaneous green and digital demands.

Research Limitations

The cross-sectional and self-reported design limits causal interpretation and generalisability. Future research should use longitudinal and multi-source designs and further validate the dimensional structure of human resource maturity.

Theoretical and Practical Applications and Implications

The findings suggest that public organisations should manage the twin transition as an organisational maturation process. Digital investment should be accompanied by Green HRM, employee development, participation and visible managerial support, while capability-building should be differentiated according to workforce needs.

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HUMANE BUT VIRTUAL?

PERCEPTIONS OF VIRTUAL INFLUENCERS PROMOTING HEALTHY EATING AND FITNESS

Kaya, Ece[1]

Kaufmann, Hans Rüdiger[2]

[1]University of Applied Management Studies Mannheim, Mannheim, Germany

[2]University of Applied Management Studies Mannheim, Mannheim, Germany

Keywords: Virtual Influencer, Authenticity, Trust, Credibility, Fitness, Healthy Eating

INTRODUCTION

Virtual influencers (VIs) are AI-generated social media entities increasingly used in branding and social issue communication, such as pro-environmental causes (Gerrath et al., 2024). They often resemble humans but do not physically exist.

PURPOSE, AIM, AND OBJECTIVES

As highlighted by Gerrath et al. (2024), there is a need to examine whether VIs can be effective in human-centered issues. This study explores how VIs are perceived in the healthy eating and fitness context. The objectives focus on perceptions of VIs, relational engagement, and the role of message style and tone in shaping acceptance.

LITERATURE REVIEW

Existing studies show mixed views on VIs: while human-like appearance may increase attention and perceived trust, it may also trigger discomfort and uncanny feelings. Credibility and authenticity are debated, as the artificial nature of VIs challenges perceptions of trust and

lived experience. The framework is mainly informed by Gerrath et al. (2024), who link message cues such as warmth to social-psychological distance and engagement, and supported by Wan, Lee and Ng (2024), Khalfallah and Keller (2025), Quach, Cheah and Thaichon (2024), and Kim et al. (2024), who respectively address anthropomorphism, transparency and culture, engagement mechanisms, and message style and credibility.

METHODOLOGY

Using a qualitative research design with exploratory purposes, this study adopts a case study method. Using purposive sampling, sixteen semi-structured interviews were conducted with participants aged between 18 and 35 from different cultural backgrounds. A photo-elicitation technique was used because VIs are still a relatively new concept, and visual examples supported discussion. The interview questions were pretested with a field expert.

Qualitative content analysis with 'MAXQDA' software was used to systematically analyze the interview data by combining inductive and deductive coding within a transparent and methodologically controlled process (Mayring, 2000).

MAIN FINDINGS AND CONTRIBUTION

Participants were generally more open to human-like VIs because they were easier to relate to, but this did not lead to direct acceptance. Many expressed skepticism and discomfort, especially when VIs appeared highly realistic. VIs were perceived as lacking authenticity, credibility, and trustworthiness due to the absence of real bodies and lived experience.

Participants also raised concerns about unrealistic beauty standards, body dysmorphia, and eating disorders, particularly with idealized AI-generated bodies. These findings show that appearance is not only aesthetic but also an ethical and psychological issue.

Trust depended strongly on who was behind the VI. Acceptance increased when credible experts or organizations were involved and when communication was transparent, consistent, and awareness-oriented rather than commercial.

ORIGINALITY AND VALUE

This study shows that VIs are more critically evaluated in healthy eating and fitness, a domain shaped by credibility, bodily experience and emotional relatability. It suggests that in human-centered contexts, authenticity and credibility may operate as boundary conditions for acceptance, extending virtual influencer theory by showing how perceived attributes shift when influencers lack lived experience.

LIMITATIONS

This study is based on a small, purposive sample of active social media users, limiting generalizability. Future research could include larger and more diverse samples, examine followers of fitness-related VIs, explore psychological concerns related to appearance, conduct cross-cultural comparisons, and compare perspectives of experts and users.

THEORETICAL AND PRACTICAL IMPLICATIONS

The study shows that authenticity, trust and credibility operate differently in human-centered domains. Because participants associated unsupported health messaging and idealized bodies with psychological risks, findings suggest practitioners should avoid overly idealized virtual bodies, disclose AI identity, involve credible experts, and prioritize awareness-oriented, informative, and warm communication over commercial messaging.

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THE RELEVANCE OF HUMAN-AI COLLABORATION AS A DRIVER OF INNOVATION PERFORMANCE AND AGILITY UNDER UNCERTAINTY CONDITIONS FOR SMES

Gabelaia, Ioseb[1]; Hendieh, Jacques[2]

[1]Business Faculty, Kauno Kolegija Higher Education Institution, Kaunas, Lithuania

[2]Business Faculty, INSEEC Business School, Paris, France

Abstract

These days, small and medium-sized enterprises (SMEs) use artificial intelligence to support large-scale innovations. Existing research on innovation and technology adoption emphasizes AI adoption or usage intensity which offers limited information into how human judgement and AI systems can together support innovation performance and agility for SMEs. Moreover, there is limited evidence on human-AI collaboration under uncertainty conditions. Hence, the purpose of this research was to explore the relevance of human-AI collaboration as a driver of innovation performance and agility in SMEs performing under environmental uncertainty. The author used quantitative research methodology. A survey study was designed using Quartics. The authors developed three hypotheses regarding human-AI collaboration under uncertainty. Data was collected from 221 SME managers and professionals across nine European countries. Extensive Pearson's correlation and regressions analysis were performance. Moreover, the research was grounded in the Technology Acceptance Model (TAM) focusing on individual adoption outcomes rather than strategic innovation capabilities. TAM offered a robust theoretical foundation to explain individuals perform under uncertainty. The results revealed that human-AI mechanisms play a significant role for innovation outcomes and adaptive capabilities. Lastly, this research results contribute to the theory by explaining innovation performance and agility through TAM. To practice, it offers condition under which AI improves, rather than constrains, SME innovation outcomes.

Keywords: Artificial Intelligence, Innovation, Management, Communication, Uncertainty, SMEs, Digital Transformation

Introduction

Innovation has always been accepted as a fundamental driver of competitiveness and long-term competitive advantage for SMEs. Lately, artificial intelligence mechanisms have emerged as powerful tools for enabling innovation by supporting decision-making, accelerating knowledge processing, and enabling data-driven experiments. However, there is limited evidence on how AI contributes to innovation outcomes in SMEs, especially under uncertain conditions. Furthermore, this limitation is especially salient in SMEs, where innovation decisions often rely heavily on managerial judgment. As a result, understanding innovation performance and agility demands redirecting the analytical focus from AI adoption to Human–AI collaboration mechanisms.

AI has quickly developed from a peripheral technological tool into a major component of organizational innovation processes. Businesses increasingly use AI systems in research and development, product design, and strategic decision-making, driven by expectations of improved creativity, efficiency, and innovation performance (Brynjolfsson & McAfee, 2017; Cockburn et a., 2018). Early empirical research has predominantly examined AI adoption, focusing on whether and to what extent organizations implement AI technologies and how such adoption correlates with firm-level performance outcomes (Bughin et al., 2018). While this stream of research has generated valuable insights, it offers an incomplete and potentially misleading account of AI's role in innovation.

In practice, AI does not innovate autonomously. Innovation emerges from interactions between human actors and algorithmic systems. Moreover, innovation increasingly develops under environmental uncertainty, illustrated by rapid technological change, shifting customer demands, and aggressive competition. These have a two-fold impact on SMEs. Nevertheless, empirical research exploring how human–AI collaboration drives innovation performance *under uncertainty* is scarce, specifically in the SME context. Further, it is argued that uncertainty, whether environmental, technological, task-related, or data-driven, plays a critical moderating role in determining when and how human–AI collaboration enhances innovation performance. Conversely, in more stable and well-structured contexts, greater reliance on AI may yield efficiency gains but risk constraining exploratory innovation (Raisch & Krakowski, 2021).

To address this research gap, the authors grounded this research in the Technology Acceptance Model (TAM). TAM has often been applied to explore technology adoption through perceived

usefulness, perceived ease of use, and trust-related beliefs. In this research, the authors conceptualize Human–AI collaboration through multiple mechanisms: perceived usefulness with task complementarity and decision-support quality; perceived ease of use with AI literacy and human oversight; and trust in AI systems. Moreover, Innovation performance and agility are examined as key outcome variables, while environmental uncertainty serves as a moderating condition that shapes the effectiveness of human–AI collaboration.

The purpose of this research was to explore the relevance of human-AI collaboration as a driver of innovation performance and agility in SMEs performing under environmental uncertainty. Three hypotheses were developed, a) Human–AI collaboration is positively associated with innovation performance in SMEs, b) Human–AI collaboration is positively associated with innovation agility in SMEs, and c) Environmental uncertainty positively moderates the relationship between Human–AI collaboration and innovation outcomes. Data from 221 SME professionals across nine countries were collected using Qualtrics software. Moreover, descriptive and inferential statistics were performed using SPSS 30. The results contribute to theory by explaining innovation performance under uncertainty, and to practice by offering evidence-based guidance on how SMEs can strategically use Human–AI collaboration rather than simply use AI technologies.

Literature Review

Unlike earlier generations of technology that primarily automated routine or well-structured tasks, contemporary AI systems increasingly perform cognitive and quasi-creative functions, including idea generation, prediction, evaluation, and optimization (Rammer et al., 2022; Agrawal et al., 2019; Cockburn et al., 2018). This shift blurs traditional boundaries between human and machine cognition and calls for human–AI collaboration (Bahoo et al.,2023; Kuzior et al., 2022). Moreover, AI systems are not neutral tools but are imbued with assumptions, biases in training data, and optimization objectives that shape and are shaped by organizational norms and power relations (Faraj et al., 2018; Orlikowski, 2007). Consequently, innovation outcomes depend not only on the technical capabilities of AI, but also on how these systems are embedded in organizational workflows, how authority and accountability are distributed between human and algorithmic actors, and how organizational members interpret, trust, or contest algorithmic outputs (Lebovitz et al., 2021; Raisch & Krakowski, 2021). AI-enabled innovation is therefore best

understood as a socio-technical accomplishment rather than a purely technological one (von Krogh, 2023).

Contemporary research emphasizes the importance of examining AI-enabled innovation performance across multiple levels of analysis, reflecting the distributed and emergent nature of human–AI collaboration (Bailey et al., 2022). Moreover, recent scholarship increasingly conceptualizes innovation performance as a multidimensional and contingent construct, particularly in contexts shaped by artificial intelligence and advanced analytics (Bahoo et al.,2023; Li et al., 2023). Rather than treating innovation performance as a unidimensional outcome, contemporary studies emphasize that AI-enabled innovation affects different performance dimensions in distinct and sometimes opposing ways (Bailey et al., 2022; Belhadi et al., 2024; von Krogh, 2018).

At the individual level, innovation performance is associated with changes in creativity, productivity, and learning among knowledge workers interacting with AI systems (Gama & Magistretti, 2025). Recent studies show that individual outcomes depend on how AI systems are framed as supportive partners or controlling mechanisms, and on the extent to which individuals retain agency in decision-making and sensemaking processes (Dellermann et al., 2019; Kuzior et al., 2022). At the team level, innovation performance reflects collective outcomes such as coordination quality, shared understanding, and team learning (Grashof & Kopka, 2023). AI systems increasingly mediate collaboration by structuring task interdependencies, prioritizing information, or generating shared representations, thereby influencing how teams explore and evaluate ideas (Haefner et al., 2021). And at the organizational level, innovation performance is commonly assessed through indicators such as innovation output, speed of new product development, and strategic renewal (Bahoo et al., 2023). At this level, human–AI collaboration becomes embedded in routines, governance structures, and decision architectures, shaping the organization's dynamic innovation capabilities rather than isolated project outcomes (Dwivedi et al., 2023; Kuzior et al., 2022).

Prior research suggests that human–AI collaboration displays through several recurring modes, reflecting different distributions of cognitive labor, authority, and control between human actors and AI systems (Raisch & Krakowski, 2021; Amabile, 2020; Cockburn et al., 2018; Lebovitz et al., 2021; Raisch & Krakowski, 2021). To address these, we advance a process-oriented conceptualization of human–AI collaboration (Dellermann et al., 2017; Cockburn et al., 2018).

Human–AI collaboration refers to a configuration of interdependent activities in which human actors and AI systems jointly contribute to problem formulation, solution generation, evaluation, and implementation throughout the innovation process (Tekic & Füller, 2023; Dougherty & Dunne, 2011). This definition shifts analytical attention away from AI as a static technological input toward the dynamic interaction and coordination between human and algorithmic agents (Belhadi et al., 2024). Consistent with socio-technical systems theory, this perspective emphasizes complementarity, interdependence, and evolving roles rather than mere tool usage (Orlikowski, 2007).

The value of human–AI collaboration is fundamentally contingent on the level and type of uncertainty characterizing the innovation context (Jarrahi et al., 2020). Under conditions of high uncertainty, purely algorithmic approaches often struggle due to unstable data-generating processes, shifting problem definitions, and limited opportunities for reliable feedback (Agrawal et al., 2019). In such settings, human sensemaking becomes critical for framing problems, interpreting ambiguous signals, and revising assumptions (Bahoo et al.,2023; Orlikowski, 2007).
At the same time, AI systems can complement human judgment by expanding the search space, generating diverse alternatives, and identifying patterns that may escape human cognition (Cockburn et al., 2018). Rather than substituting for human decision-making, AI provides computational capabilities that support exploration and experimentation (Gama & Magistretti, 2025). The interaction between these complementary capabilities, human interpretive judgment and algorithmic analytical power, determines whether collaboration enhances or undermines innovation performance (Truong & Papagiannidis, 2022; Bailey et al., 2022).
When collaboration is poorly designed, uncertainty may amplify coordination failures, reinforce cognitive biases, or encourage overreliance on unreliable algorithmic outputs (Gama & Magistretti, 2025; Belhadi et al., 2024). Conversely, when collaboration aligns human and AI strengths with the demands of uncertain tasks, it can improve adaptability, learning, and innovation outcomes (Johnson et al., 2022; Mariani et al., 2023; Wang et al., 2023).

Research Methodology

To explore the relevance of Human–AI collaboration as a driver of innovation performance and agility in SMEs operating under environmental uncertainty, the authors used a quantitative research method. A survey study comprising 33 questions was designed in Qualtrics.

The survey allowed measurement of human–AI collaboration through multiple constructs within the Technology Acceptance Model (TAM). Accordingly, innovation performance (INNOP) and innovation agility (INNOA) were outcome variables that addressed innovation outcomes and adaptive ability. Besides, environmental uncertainty (UNC) was measured as a moderator reflecting perceived volatility in markets, technologies, and competitive conditions. All variables were measured using Likert scales.

Data collection was administered using Qualtrics. The authors used convenience and snowball sampling. The survey link with consent forms was shared on professional networks for SME managers and professionals with direct involvement in innovation and digital transformation. The consent form specifically asked about practical experience with AI tools and systems in the context of innovation.

Data from 221 cases were analyzed using SPSS 30. The authors conducted tests of normality, descriptive analyses, ANOVA, Pearson's correlation, and regression analyses to examine the role of Human–AI collaboration in shaping innovation outcomes under uncertainty.

Research Findings

The research was conducted between March 22nd – November 27th, 2025. The data was obtained from SME managers and professionals from nine European countries. Overall, 278 responses were collected. The authors performed a systematic cleaning and screening process for data quality and reliability. The cases with large missing data, 15% missing values, straight-lining and inconsistent answers were detected and removed. After these multi-stage cleaning, 57 cases were removed, and leaving 221 cases for further analysis. The cleaned dataset was sufficient and met recommended sample size thresholds for further statistical analysis.

The authors performed the descriptive statistics to summarize the central tendency and dispersion of variables for hypothesis testing. The results are illustrated in Table 1. The results show that overall, the mean values demonstrate moderately high levels of Human-AI collaboration across SMEs. Between collaboration-related constructs DSQ (M = 3.92, SD = 0.68) and COMP (M = 3.87, SD = 0.71) showed the highest mean scores. This indicates that respondents mostly perceived AI systems as valuable mechanisms that complement human judgment and improve decision-making in innovation-related activities. Moreover, employee focused constructs, AILIT (M = 3.61, SD = 0.74) and TRUST (M = 3.66, SD = 0.72), revealed moderate mean values. Hence this suggests variation in employee's capability to interpret AI outputs and their willingness to trust

on AI-supported recommendations. Additionally, OVERS (M = 3.78, SD = 0.69), and LEARN (M = 3.75, SD = 0.70), also demonstrated relatively high mean scores. Yet again supporting the continued relevance of judgment and learning-oriented practices in AI-supported innovation for SMEs. Lastly, regarding outcome variables, INNOP (M = 3.89, SD = 0.65), and INNOA (M = 3.81, SD = 0.69), showed moderately high-level means. Moreover, UNC (M = 3.94, SD = 0.73), revealed a comparatively high mean and notable variability, which is consistent with the dynamic and uncertain environments that SMEs face across different European and global markets.

Variable	M	SD	Min	Max
Human-AI Task Complementarity (COMP)	3.87	0.71	1.8	5.0
AI Decision Support Quality (DSQ)	3.92	0.68	2.0	5.0
Employee AI Literacy (AILIT)	3.61	0.74	1.6	5.0
Human Oversight and Control of AI (OVERS)	3.78	0.69	2.1	5.0
Trust in AI Systems (TRUST)	3.66	0.72	1.9	5.0
Data Quality and Availability (DATAQ)	3.83	0.67	2.0	5.0
Organizational Learning Orientation (AI) (LEARN)	3.75	0.70	2.0	5.0
Innovation Performance (INNOP)	3.89	0.65	2.2	5.0
Innovation Agility (INNOA)	3.81	0.69	2.0	5.0
Environmental Uncertainty (UNC)	3.94	0.73	2.1	5.0

Table 1: Descriptive Statistics (N = 221) Developed by the Authors

The authors conducted ANOVA to examine difference in innovation performance and agility across education levels, work experiences and age groups. Table 2 shows that the results demonstrated a statistically significant effect of education level on INNOP, $F(3,217) = 3.87$, $p = .010$, suggesting that innovation performance differs across education groups. Regarding INNOA, the results showed a statistically significant effect across education levels $F(3,217) = 3.52$, $p = .016$, suggesting that INNOA varies based on education levels. Hence, these results propose that educational background may play significant role in SMEs capabilities to use Human-AI collaboration for innovation outcomes.

Source	SS	df	MS	F	p
Between Groups	4.26	3	1.42	3.87	.010
Within Groups	79.59	217	0.37		
Total	83.85	220			

Table 2: One-Way ANOVA for Innovation Performance by Education Level (N = 221) Developed by the Authors

Moreover, years of professional experience for INNOP was statistically significant, $F(4,216) = 4.92$, $p = .001$, illustrated in Table 3. This result demonstrates that experience levels differ across experience levels. The similar results were observed for INNOA. The results showed a statistically significant effect, $F(4,216) = 4.69$, $p = .001$. Thus, these results suggest that more experienced

individuals are, they might be better positioned to use AI-based insights to make innovation decisions for SMEs.

Source	SS	df	MS	F	p
Between Groups	6.14	4	1.54	4.92	.001
Within Groups	67.91	216	0.31		
Total	74.05	220			

Table 3: One-Way ANOVA for Innovation Performance by Work Experience (N = 221) Developed by the Authosr

Lastly, ANOVA was conducted to access differences for INNOP across age groups. Table 4 shows that age was not statistically significant $F(3,217) = 1.98$, $p = .118$. Moreover, for innovation agility, the results were also no statistically significant $F(3,217) = 1.84$, $p = .140$. Hence, these results suggest that age alone does not substantially differentiate innovation performance and agility among SME professionals. This reinforces the relevance of collaborative factors over demographic characteristics.

Source	SS	df	MS	F	p
Between Groups	2.18	3	0.73	1.98	.118
Within Groups	80.07	217	0.37		
Total	82.25	220			

Table 4: One-Way ANOVA for Innovation Performance by Age Group (N = 221) Developed by the Author

Moreover, the authors conducted the Pearson's correlation analysis. Table 5 illustrates the results. The results demonstrated that all Human-AI collaboration constructs showed positive and statistically significant correlations with innovation performance and agility. Notably, DSQ revealed a strong association with INNOP ($r = .62$, $p < .01$) and INNOA ($r = .58$, $p < .01$). This suggests that high-quality AI generated insights are significant in supporting SME innovation outcomes. Additionally, COMP was also strongly correlated with INNOP ($r = .59$, $p < .01$) and INNOA ($r = .56$, $p < .01$), emphasizing the value of human judgment and AI capabilities.

On the contrary, employee-centric constructs, AILIT and LEARN, showed moderate to strong positive correlations with innovation outcomes. These results suggest that learning proficiency support effective Human-AI collaboration. Moreover, TRUST was positively associated to INNOP ($r = .55$, $p < .01$) and INNOA ($r = .53$, $p < .01$), hence reinforcing the relevance of trust-based acceptance mechanisms developed from TAM. UNC was positively correlated with INNOP ($r = .27$, $p < .01$) and INNOA ($r = .29$, $p < .01$) suggesting that SMEs which operate in high volatile environments might faster adapt to AI-supported innovation practices.

Variable	1	2	3	4	5	6	7	8	9	10
Human-AI Task Complementarity (COMP)	-									

AI Decision Support Quality (DSQ)	.54**	-								
Employee AI Literacy (AILIT)	.46**	.49**	-							
Human Oversight and Control of AI (OVERS)	.42**	.45**	.38**	-						
Trust in AI Systems (TRUST)	.51**	.58**	.44**	.47**	-					
Data Quality and Availability (DATAQ)	.48**	.56**	.41**	.39**	.52**	-				
Organizational Learning Orientation (LEARN)	.50**	.47**	.53**	.44**	.49**	.46**	-			
Innovation Performance (INNOP)	.59**	.62**	.48**	.46**	.55**	.57**	.54**	-		
Innovation Agility (INNOA)	.56**	.58**	.52**	.49**	.53**	.55**	.57**	.66**	-	
Environmental Uncertainty (UNC)	.21**	.24**	.18*	.20**	.22**	.23**	.25**	.27**	.29**	-

Table 5: Pearsons Correlation Matrix (N = 221) Developed by the Authors

Furthermore, the authors conducted the regressions analysis. Table 6, and Table 7 illustrate the results. First, Table 6 shows the hierarchical regression results predicting innovation performance (INNOP). In this table, there are three models. In Model 1, which only contained control variables, education ($\beta = .14, p < .05$) and experience ($\beta = .18, p < .01$) were positively related with innovation performance, accounting 9% of the variance.

In the model 2, the human-AI collaboration mechanisms were introduced. This resulted in significant increase in explained variance ($\Delta R^{2} = .39, p < .01$). COMP ($\beta = .21, p < .01$), DSQ ($\beta = .26, p < .01$), AILIT ($\beta = .13, p < .05$), TRUST ($\beta = .17, p < .01$), DATAQ ($\beta = .19, p < .01$) and LEARN ($\beta = .22, p < .01$) all demonstrated significant positive effects on innovation performance. Moreover, these results offer a significant support for H_1.

In the model 3, the authors tested the moderating role of environmental uncertainty. Environmental uncertainly had a significant positive effect on innovation performance ($\beta = .15, p < .05$). Additionally, COMP×UNC ($\beta = .12, p < .05$), DSQ×UNC ($\beta = .16, p < .01$) and TRUST×UNC ($\beta = .14, p < .05$) were significant. Notably, the inclusion of interaction terms explained an additional 6% variance ($\Delta R^{2} = .06, p < .01$), revealing that the positive effects of Human-AI collaboration on innovation performance are improved under heightened uncertainty, therefore supporting H_3.

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	Predictor	B	Std. Error	β		
1	(Constant)	2.11	.18	-	11.72	.000
	Age	.04	.03	.06	1.32	.188

	Education	.11	.05	.14	2.21	.028
	Experience	.15	.04	.18	3.68	.000
2	(Constant)	1.24	.21	-	5.90	.000
	Age	.03	.02	.04	1.09	.276
	Education	.07	.04	.09	1.78	.076
	Experience	.09	.04	.11	2.34	.020
	COMP	.18	.04	.21	4.51	.000
	DSQ	.21	.04	.26	5.82	.000
	AILIT	.10	.04	.13	2.44	.015
	OVERS	.08	.04	.10	2.07	.039
	TRUST	.14	.04	.17	3.69	.000
	DATAQ	.16	.04	.19	4.05	.000
	LEARN	.19	.04	.22	4.98	.000
3	(Constant)	1.19	.22	-	5.41	.000
	Age	.02	.02	.03	.87	.387
	Education	.06	.04	.08	1.56	.120
	Experience	.08	.04	.10	2.05	.041
	COMP	.15	.04	.18	3.86	.000
	DSQ	.19	.04	.23	4.99	.000
	AILIT	.09	.04	.11	2.21	.028
	OVERS	.07	.04	.09	1.89	.060
	TRUST	.12	.04	.14	2.98	.003
	DATAQ	.14	.04	.16	3.51	.001
	LEARN	.17	.04	.20	4.22	.000
	UNC	.11	.05	.15	2.33	.021
	COMP×UNC	.07	.03	.12	2.18	.030
	DSQ×UNC	.09	.03	.16	3.01	.003
	TRUST×UNC	.08	.03	.14	2.56	.011

Table 6: Hierarchical Regression Analysis Predicting Innovation Performance (N = 221)

Table 7 shows the hierarchical regression results predicting innovation agility (INNOA). In this table, there are also three models. In Model 1, education ($\beta = .11$, $p < .05$) and experience ($\beta = .16$, $p < .01$) were positively associated with innovation agility, explaining 8% of the variance.

Furthermore, In the model 2, the human-AI collaboration variables were introduced which significantly increased explained variance ($\Delta R^2 = .42$, $p < .01$). Accordingly, COMP ($\beta = .19$, $p < .01$), DSQ ($\beta = .22$, $p < .01$), AILIT ($\beta = .18$, $p < .01$), OVERS ($\beta = .14$, $p < .05$), TRUST ($\beta = .16$, $p < .01$), DATAQ ($\beta = .17$, $p < .01$) and LEARN ($\beta = .25$, $p < .01$) all revealed significant positive effects on innovation agility. Additionally, these results support H_2.

In the model 3, the moderation effects were tested by environmental uncertainty showing a significant positive effect ($\beta = .18$, $p < .01$). Moreover, AILIT×UNC ($\beta = .15$, $p < .01$), LEARN×UNC ($\beta = .19$, $p < .01$) and COMP×UNC ($\beta = .11$, $p < .05$) were significant. Besides, this explained an additional 7% variance ($\Delta R^2 = .07$, $p < .01$), suggesting that Human-AI mechanisms impact innovation agility under heightened uncertainty, supporting H_3.

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model	Predictor	B	Std. Error	β		
1	(Constant)	2.06	.17	-	12.12	.000
	Age	.03	.03	.05	1.10	.273
	Education	.09	.05	.11	2.02	.045
	Experience	.13	.04	.16	3.41	.001
2	(Constant)	1.12	.21	-	5.33	.000
	Age	.02	.02	.03	.83	.409
	Education	.05	.04	.07	1.42	.157
	Experience	.08	.04	.10	2.17	.031
	COMP	.16	.04	.19	4.07	.000
	DSQ	.18	.04	.22	4.91	.000
	AILIT	.15	.04	.18	4.03	.000
	OVERS	.12	.04	.14	2.88	.004
	TRUST	.13	.04	.16	3.42	.001
	DATAQ	.14	.04	.17	3.77	.000
	LEARN	.21	.04	.25	5.58	.000
3	(Constant)	1.05	.22	-	4.77	.000
	Age	.01	.02	.02	.54	.592
	Education	.04	.04	.06	1.09	.278
	Experience	.07	.04	.09	1.96	.051
	COMP	.14	.04	.17	3.69	.000
	DSQ	.16	.04	.20	4.36	.000
	AILIT	.13	.04	.16	3.58	.000
	OVERS	.10	.04	.12	2.41	.017
	TRUST	.11	.04	.14	2.97	.003
	DATAQ	.12	.04	.15	3.18	.002
	LEARN	.19	.04	.22	4.72	.000
	UNC	.14	.05	.18	2.87	.005
	AILIT×UNC	.08	.03	.15	2.89	.004
	LEARN×UNC	.10	.03	.19	3.64	.002
	COMP×UNC	.06	.03	.11	2.05	.042

7: Hierarchical Regression Analysis Predicting Innovation Agility (N = 221)

Discussions

This research explored the relevance of Human-AI collaboration as a driver of innovation performance and agility in SMEs operating in uncertain environments, grounded in the TAM framework. The statistical results provide empirical evidence that Human-AI collaboration is a strategic capability rather than simply a technological input.

The regression results revealed that Human-AI collaboration mechanisms significantly improve innovation performance. Notably, AI decision-support quality, human–AI task complementarity, organizational learning orientation toward AI, and data quality were the strongest predictors. These results support the TAM framework, demonstrating that perceived usefulness and trust-related mechanisms not only impact technology adoption but also yield tangible innovations. Thus, for SMEs where innovation decisions are centralized and limited by

resources, human-AI collaboration becomes significant. On the other hand, similar results were observed for innovation agility. The results demonstrated that SMEs that use AI in a complementary, learning-oriented, and trust-based way are better positioned to adapt the innovative processes. Moreover, employee AI literacy and organizational learning orientation were more significant, signaling that adaptive innovation under uncertainty relies less on automation and more on human interpretive and learning capabilities. These results reinforce the argument that ease of use and competence are fundamental for dynamic innovation capabilities, whereas system acceptance is less important.

Furthermore, environmental uncertainty strengthened the impact of Human-AI collaboration on innovation performance and agility. The results revealed that this type of collaboration becomes more valuable as uncertainty increases. Hence, in volatile markets and technological conditions, SMEs that effectively use AI alongside human expertise or oversight reach greater innovation benefits. These results align with contingency-capabilities perspectives, which suggest that AI-supported collaboration is context-dependent rather than universally beneficial. For example, in stable conditions, AI might improve efficiency, however, under uncertainty, it could become a strategic enabler of innovation and adaptability.

The results revealed that rather than treating AI as an external driver of performance, this research shows that innovation increases through accepted, trusted, and well governed Human–AI collaboration mechanisms, especially in uncertain environments. Therefore, these results challenge technology-deterministic accounts and emphasize the importance of human capabilities, a learning orientation, and trust in recognizing AI-driven innovation.

Table 8 summarizes hypothesis testing results.

- H_1. Human–AI collaboration mechanisms are positively associated with innovation performance in SMEs - was supported. SMEs that show higher levels of effective Human–AI collaboration characterized by COMP, DSQ and OVERS, are likely to reach superior innovation performance.
- H_2. Human–AI collaboration mechanisms are positively associated with innovation agility in SMEs - was supported. The results show that effective Human–AI collaboration improves SMEs' ability to adapt, and pivot innovation activities in response to changing environmental conditions.

- H_3a and H_3b. Environmental uncertainty moderates the relationship between Human–AI collaboration and innovation outcomes - was supported. The results show that the positive impacts of Human–AI collaboration on innovation performance and agility are stronger under high environmental uncertainty than under low environmental uncertainty.

Hypothesis	Statement	DV	Key Results	Supported
H_1	Human-AI collaboration mechanisms are positively associated with innovation performance in SMEs	INNOP	Significant positive main effects of COMP, DSQ, AILIT, TRUST, DATAQ and LEARN	Yes
H_2	Human-Ai collaboration mechanisms are positively associated with innovation agility in SMEs	INNOA	Significant positive main effects of COMP, DSQ, AILIT, OVERS, TRUST, DATAQ and LEARN	Yes
H_3a	Environmental uncertainty moderates the relationship between Human-AI collaboration and innovation performance	INNOP	Significant interaction effects for COMP×UNC, DSQ×UNC, TRUST×UNC	Yes
H_3b	Environmental uncertainty moderates the relationship between Human-AI collaboration and innovation agility	INNOA	Significant Interaction effects for AILIT×UNC, LEARN×UNC, COMP×UNC	Yes

8: Summary of Hypothesis Testing Results

Conclusion

This research explored the relevance of human–AI collaboration as a driver of innovation performance and agility in SMEs performing under environmental uncertainty. Moreover, the research process was grounded in the Technology Acceptance Model (TAM). Data was extracted and analyzed from 221 SME professionals from nine European countries.

The results revealed that human–AI collaboration mechanisms, such as task complementarity, AI decision support quality, employee AI literacy, trust in AI systems, data quality, and organizational learning orientation, are significant in developing and accepting innovation capabilities. Moreover, the results suggested that AI is a significant contributor to SMEs when it is accepted, trusted, and integrated with human judgment. Moreover, supporting TAM conditions. The results also revealed that environmental uncertainty was a critical factor in exploring the value of human-AI collaboration. Accordingly, the results emphasized that when volatile and unpredictable conditions exist, SMEs have a high success rate in adopting AI mechanisms for innovation performance and agility.

From a theoretical perspective, this research offers several contributions to the existing literature and knowledge on human-AI collaboration and technology acceptance in SMEs. First, continued support for TAM beyond its traditional focus by demonstrating its explanatory power for innovation. Second, develops a human-AI collaboration theory by empirically distinguishing

collaboration mechanisms from simple AI usage. The results indicated that innovation growth not from automation but from structured complementarities between human judgment and AI systems, which was supported by data quality, learning orientation, and trust. Third, this research extends knowledge on innovation under uncertainty by positioning it as a significant condition. As the results revealed, Human–AI collaboration mechanisms are more significant when SMEs function in volatile environments.

From a managerial perspective, the results offer guidance for SME leaders who intend to use AI for innovation. First, management must accept AI not only as technology but also use it to design human-AI architecture. Second, focus on explainable, reliable, and contextually relevant AI systems. Poor quality undermines trust and limits innovation. Third, invest in AI literacy and organizational learning. The results showed that the encouraging experiments will strengthen innovation performance, agility, and resilience. Lastly, incorporate environmental uncertainty into the AI strategy. SMEs must actively strengthen human-AI collaboration and governance to fully exploit the power of AI for innovation.

Despite its contributions, this research has several limitations. First, even though the work is grounded in the TAM framework and the empirical data are robust, it would be beneficial to observe causal inference. Second, this research relies on self-reported data, which may introduce common method bias. Third, while the multi-country European sample enhances generalizability within the SME context, cultural and institutional differences were not explicitly modeled.

At last, future research could integrate objective performance indicators, archival data, or experimental designs to triangulate results and improve measurement rigor. Also, testing alternative theoretical lenses, including dynamic capabilities theory, design thinking frameworks, and more. Such additional research would further enrich the understanding of how human–AI collaboration contributes to innovation in SMEs.

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USEFUL BUT ETHICAL? UNDERSTANDING STUDENTS' ADOPTION OF GENERATIVE AI IN HIGHER EDUCATION

Mauro Rodríguez-Marin[1] and Miguel Ángel Montoya Bayardo[2]

[1] Department of Marketing and Analysis, Business School,
Tecnologico de Monterrey, Monterrey, Mexico.
[2] Institute for the Future of Education, Tecnologico de Monterrey, Monterrey, Mexico.

Keywords: Generative AI, Higher Education, Technology Adoption, Ethical Concerns, Academic Integrity, AI Literacy, Student Perceptions.

Abstract

Generative artificial intelligence (GenAI) is rapidly becoming embedded in higher education, yet its adoption creates a tension between educational utility and ethical concerns. This study examines the factors shaping university students' intention to use GenAI, integrating technology acceptance perspectives with considerations of academic integrity and responsible use. A quantitative, cross-sectional survey was conducted among 219 undergraduate students from public and private universities in Mexico. Covariance-based structural equation modelling (CB-SEM) was employed to assess the relationships among perceived usefulness, learning support, trust, ethical concerns, and intention to use GenAI. Results show that perceived usefulness ($\beta = .48$) and learning support ($\beta = .36$) positively influence intention to use, whereas ethical concerns exert a significant negative effect ($\beta = -.29$). Trust does not significantly predict adoption intention. The model explains 62% of the variance in intention to use. The study reveals a utility–ethics tension in GenAI adoption and contributes evidence from an emerging-economy context, highlighting the need for AI literacy, responsible-use policies, and assessment redesign.

Introduction

Generative artificial intelligence (GenAI) is reshaping how students learn and produce academic work (Adalı & Bilgili, 2025). Large language models provide writing, explanation, and problem-solving support (Maity & Deroy, 2024), while raising concerns about integrity, reliability, and autonomy (Francis et al., 2025). Student adoption is accelerating for writing, summarization, and analytical problem solving (Johri et al., 2024; Kim et al., 2025), with perceived value and ethical acceptability varying across contexts (Almassaad et al., 2024; Kim et al., 2025). Students and academics recognize learning and efficiency benefits alongside concerns about assessment and responsible use (Haroud, 2025; Sabbaghan & Eaton, 2025).

GenAI integration creates a tension between efficiency and concerns about critical thinking, originality, privacy, and over-reliance (Sutedjo et al., 2025). Frequent use does not necessarily produce deeper learning (Jordan et al., 2025), while institutions face challenges involving plagiarism, authorship, assessment redesign, and misconduct (Bittle, 2025). Unreflective use may weaken deeper reasoning (Haroud, 2025), prompting calls for ethical governance and responsible implementation (Møgelvang et al., 2025; Nicola-Richmond et al., 2025) based on human-centered safeguards, transparency, data protection, and equity (Chan & Colloton, 2024). Evidence from emerging economies remains limited (Okoye et al., 2022). In Mexico, institutional heterogeneity shapes GenAI adoption and perceptions of educational and ethical value (Chan & Hu, 2023). This study therefore examines educational benefits and ethical concerns among students in Mexican public and private universities during 2024–2025. It contributes context-sensitive evidence, integrates benefits and ethics in one framework, and informs guidelines, AI literacy, and assessment redesign (Jiao et al., 2024). RQ1 asks how students perceive GenAI benefits for productivity, learning support, and time efficiency; RQ2 examines academic integrity, trust, and over-reliance in Mexican higher education.

Literature Review

Students recognize GenAI's potential for writing, personalized learning, and research support while reporting concerns about misinformation, plagiarism, and AI-driven inequalities (Plata et al., 2023; Saúde et al., 2024). These risks may undermine assessment validity and critical thinking, strengthening the case for clear institutional guidelines (Lyu et al., 2025; Sánchez et al., 2025).

Disciplinary background shapes GenAI perceptions: technical students tend to be more optimistic (Kayadibi, 2025), reflecting differences in how disciplines view algorithmic tools, originality, and intellectual work (Chan & Hu, 2023; Wang et al., 2025). Across disciplines, however, students remain concerned that over-reliance may erode critical thinking and the value of higher education (Chan & Hu, 2023; Siraj et al., 2025).

Academic integrity is central to GenAI assessment: AI-assisted work may increase plagiarism and weaken evaluation reliability (Khlaif et al., 2024). Institutions are responding through learning-environment and regulatory adjustments (Heil et al., 2025; Singh & Ngai, 2024). Educators are generally more skeptical than students, who emphasize productivity gains while acknowledging possible losses in creativity and personalized feedback (Smith et al., 2024; Roe et al., 2024; Siraj et al., 2025).

GenAI may support lower-order cognitive tasks, but its contribution to analysis, evaluation, and creation remains contested because over-reliance can hinder independent reasoning (Garousi et al., 2025; Bittle & El-Gayar, 2025; Perkins et al., 2024). Research therefore calls for multidimensional integration addressing ethics, skills, disciplinary diversity, privacy, bias, and transparent governance (Perkins et al., 2023; Alshamy et al., 2025; Jensen et al., 2024; Perkins et al., 2024). Building on TAM and UTAUT, this study integrates performance-related and ethical dimensions in a unified framework: perceived usefulness and learning support are expected to increase intention to use GenAI, whereas ethical concerns are expected to reduce it.

tools. Conversely, ethical concerns related to academic integrity and over-reliance are expected to negatively affect behavioral intention. Accordingly, the following hypotheses are proposed:

- H1: Perceived usefulness and perceived learning support positively influence intention to use

GenAI.

- H2: Ethical concerns negatively influence intention to use GenAI.

Materials and Methods

Research design

This quantitative, cross-sectional survey examined student perceptions of GenAI in higher education using a perception-based approach consistent with AI in Education research (Roe et al., 2024; Wu & Carroll, 2025). Conducted in 2024–2025 among undergraduates from Mexican public and private universities, the design captures current patterns of use and ethical concerns rather than causal effects (Tala et al., 2024). Figure 1 summarizes respondent gender distribution.

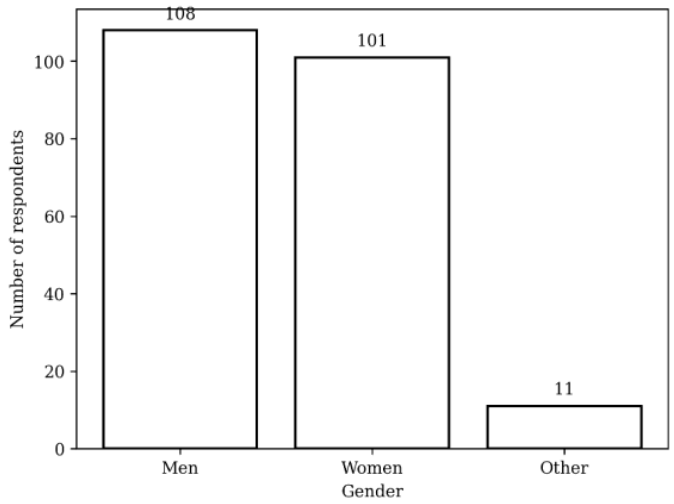


Figure 1: Gender distribution of respondents
Source: Own elaboration based on survey instrument (2024-2025)

Participants and context

Participants were undergraduates from diverse programs in Mexican public and private institutions, including ITESM, UNAM, IPN, Universidad de Guadalajara, UAEM, ANAHUAC, ITESO, IBERO, UASL, and UAA. The final sample comprised 219 valid convenience responses recruited online and in person: 113 from public and 106 from private institutions, with higher representation from business-related programs. The non-probabilistic design limits generalizability.

Instrument development

The structured online questionnaire contained four sections:

- Demographics: university type, field of study, gender, and age.
- GenAI use: frequency and academic tasks supported.
- Educational benefits: productivity, learning support, and usefulness.
- Ethical considerations: academic integrity, trust, over-reliance, and independent learning.

generated outputs, over-reliance, and long-term independent learning. Items used five-point Likert scales (1 = Strongly disagree, 5 = Strongly agree), were informed by prior GenAI studies, and were pilot-tested for clarity and face validity.

Constructs and measurement

Five theoretically grounded constructs were measured:

- Perceived Usefulness (PU): perceived improvement in academic productivity and task performance.
- Perceived Learning Support (PLS): support for understanding, autonomy, and engagement.
- Trust in Generative AI (TRUST): confidence in output accuracy and reliability.
- Ethical Concerns (EC): integrity, over-reliance, and responsible-use risks.
- Intention to Use (ITU): willingness to continue GenAI use in academic activities.

academic activities. All items used five-point Likert scales (1 = strongly disagree, 5 = strongly agree).

Construct	Items	Scale
Perceived Usefulness (PU)	PU1, PU2, PU3, PU4	Likert (1= strongly disagree, 5= strongly agree)
Perceived Learning Support (PLS)	PLS1, PLS2, PLS3	Likert (1= strongly disagree, 5= strongly agree)

Trust in Generative AI (TRUST)	TRUST1, TRUST2, TRUST3	Likert (1= strongly disagree, 5= strongly agree)
Ethical Concerns (EC)	EC1, EC2, EC3	Likert (1= strongly disagree, 5= strongly agree)
Intention to Use (ITU)	ITU1, ITU2	Likert (1= strongly disagree, 5= strongly agree)

Table 1: Measurement Constructs and Survey Items
Source: Own elaboration with R Software based on survey instrument (2024-2025)

Data collection procedure

The online survey was distributed through institutional channels and academic networks. Participants received informed-consent information on purpose, voluntariness, anonymity, and confidentiality and were told there were no right or wrong answers.

Python and R were used for descriptive statistics, reliability assessment, and structural equation modeling. Means, standard deviations, frequencies, and percentages summarized demographics and GenAI use.

Hypotheses H1–H2 were tested with covariance-based structural equation modeling (CB-SEM), selected for confirmatory theory testing, simultaneous assessment of measurement and structural models, and global goodness-of-fit estimation.

CB-SEM assumptions, including sample adequacy and data characteristics, were assessed before estimation. Internal consistency exceeded 0.70 for all constructs: Perceived Usefulness $\alpha = 0.905$, Ethical Concerns $\alpha = 0.871$, and Trust in

Generative AI $\alpha = 0.847$; Perceived Learning Support $\alpha = 0.823$ and Intention to Use $\alpha = 0.855$. CFA supported convergent validity, with standardized loadings of 0.75–0.88 (Bai & Yang, 2025; Chan & Zhou, 2023; Kanont et al., 2024); AVE supported discriminant validity (Holzmann et al., 2025).

Structural evaluation estimated standardized path coefficients (β), p-values, R^2, and model fit using CFI, RMSEA, and SRMR.

Construct	Number of Items	Cronbach's Alpha
Perceived Usefulness	4	0.905
Perceived Learning Support	3	0.823
Trust in Generative AI	3	0.847
Ethical Concerns	3	0.871
Intention to Use	2	0.855

Table 2: Reliability Analysis of Measurement Constructs
Source: Own elaboration with R Software based on survey instrument (2024-2025)

The CB-SEM structural model tested H1–H2 through standardized coefficients, significance tests, and global fit indices.

Ethical considerations

Participation was voluntary, informed consent was obtained, no personally identifiable information was collected, and data were anonymized, securely stored, and reported in

aggregate. The study followed institutional ethical guidelines and emphasized transparency in data handling and interpretation.

Methodological limitations

Limitations include self-reported perceptions, possible response bias, a cross-sectional design that precludes causal inference, and limited generalizability beyond the sampled Mexican public and private universities. Cultural and regulatory conditions may also shape perceptions differently elsewhere.

Results

Descriptive results

Overall, 78.4% of students reported using GenAI at least occasionally for academic purposes; mean frequency was 3.82 (SD = 1.12) on a five-point scale (Razmerita, 2024). Perceived usefulness and learning support both exceeded 4.0 (Table 3).

Construct	Mean	Std. Dev.
Perceived Usefulness (PU)	4.02	1.04
Perceived Learning Support (PLS)	4.12	1.01
Trust in Generative AI (TRUST)	3.31	0.89

Table 3: Descriptive Statistics for Key Constructs
Source: Own elaboration with R Software based on survey instrument (2024-2025)

Students viewed GenAI as useful for productivity and learning, while lower trust suggested cautious, pragmatic adoption. Public (n = 113) and private (n = 106) institutions were nearly balanced (Figure 2).

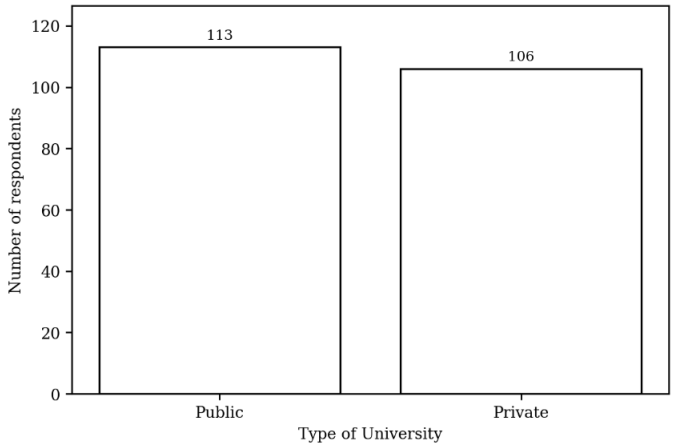


Figure 2: Distribution of respondents by type of university
Source: Own elaboration based on survey instrument (2024-2025)

Figure 3 summarizes respondents by field of study.

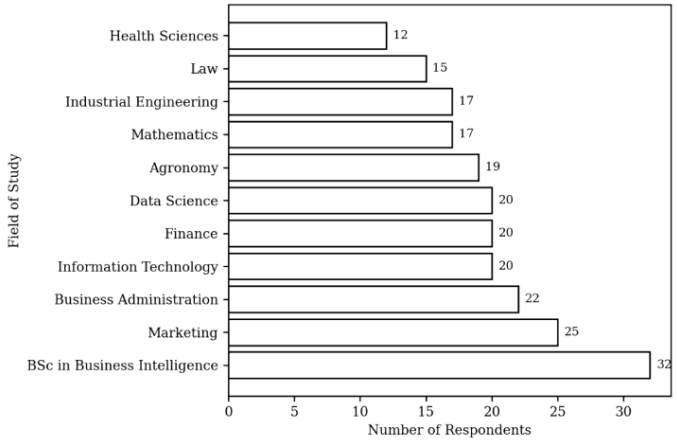


Figure 3: Distribution of respondents by field of study (Career)
Source: Own elaboration based on survey instrument (2024-2025)

Business Intelligence, Marketing, and Business Administration were more represented, contextualizing perceptions in fields where data-driven tools are common.

Figure 4 shows that most students use GenAI at least occasionally for academic purposes.

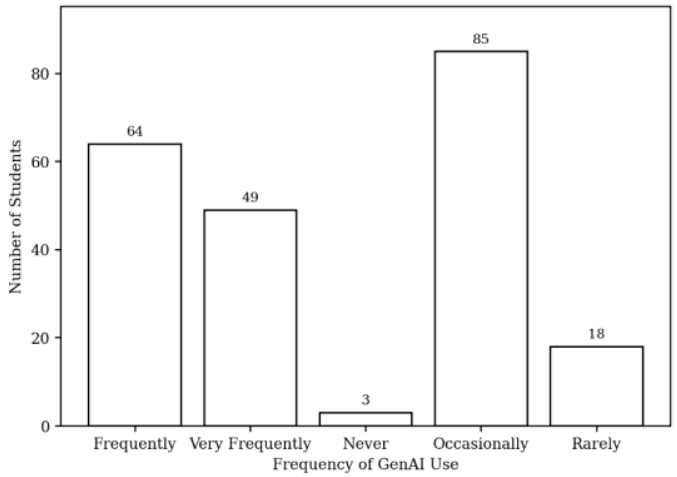


Figure 4: Frequency of Generative AI Use for Academic Tasks
Source: Own elaboration based on survey instrument (2024-2025)

Figure 5 presents the conceptual model: PU and PLS positively predict ITU, EC negatively predicts ITU, and TRUST is included but is non-significant in the structural results.

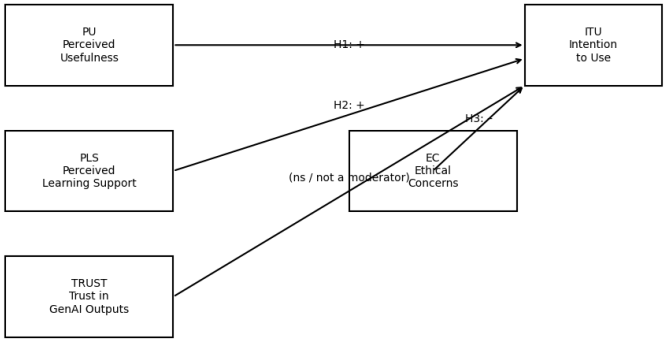


Figure 5: Structural Equation Model (SEM)- Conceptual Model
Source: Own elaboration

Measurement model

The measurement model assessed reliability and validity before structural testing across PU, PLS, EC, TRUST, and ITU.

PU and PLS means were high, indicating perceived productivity and learning benefits (Deng et al., 2025). Lower trust and ethical-concern scores reflected caution about accuracy and integrity (Deng et al., 2025); EC averaged 2.45 (Holzmann et al., 2025). Thus, pragmatic adoption coexists with ethical reservations (Calderwood, 2024; Johri et al., 2024), consistent with concerns about plagiarism, intellectual property, and critical thinking (Alshamy et al., 2025; Johri et al., 2024).

Structural model

CB-SEM supported the proposed relationships. PU ($\beta = 0.48$, $p < 0.001$) and PLS ($\beta = 0.36$, $p < 0.001$) positively predicted ITU (Bamasoud et al., 2025; Chan & Zhou, 2023), whereas EC negatively affected ITU ($\beta = -0.29$, $p < 0.01$) (Bamasoud et al., 2025; Holzmann et al., 2025). TRUST was non-significant ($\beta = 0.08$, $p > 0.05$), suggesting functional benefits outweigh reliability considerations in adoption intentions (Holzmann et al., 2025; Zhao et al., 2025). Overall, utility drives adoption while ethics constrains it (Abbas et al., 2024; Bai & Yang, 2025).

The model explained 62% of ITU variance ($R^2 = 0.62$) and showed good fit: CFI = 0.95, RMSEA = 0.052, and SRMR = 0.041 (Table 4).

Indicator	Value	Recommended Threshold	Interpretation
R^2 (ITU)	0.62	≥ 0.50	Substantial explanatory power
CFI	0.95	≥ 0.90	Good fit
RMSEA	0.052	≤ 0.08	Good fit
SRMR	0.041	≤ 0.08	Good fit

Table 4: Model Fit and Explanatory Power

Source: Own elaboration with R Software based on survey instrument (2024-2025)

Overall, high usefulness and learning support coexist with ethical constraints, while the measurement and structural results support the proposed framework.

Discussion

PU and PLS are the main drivers of GenAI adoption, consistent with TAM and UTAUT and supporting H1 (Holzmann et al., 2025). In Mexico, this reflects pragmatic adoption centered on efficiency, task completion, and productivity rather than cognitive transformation.

Students appear to use GenAI instrumentally to structure ideas, clarify concepts, and save time, while remaining uncertain about long-term effects on independent learning; this suggests a possible gap between use and learning depth.

H2 is also supported: ethical concerns influence behavioral intention and reveal tension between efficiency and educational values. Rather than simple barriers, these concerns may indicate ethical awareness and self-regulation, consistent with students' caution about originality, critical thinking, and intellectual autonomy (Alshamy et al., 2025; Calderwood, 2024; Chan & Hu, 2023).

TRUST does not directly influence behavioral intention, suggesting instrumental benefits dominate perceived reliability. Students may use GenAI despite uncertainty through verification or selective use; TRUST may therefore be a hygiene factor in early adoption or become more salient as governance and user experience mature.

In Mexico, GenAI diffusion across public and private institutions appears faster than formal regulation. This self-regulated environment helps explain high adoption alongside ethical concerns and supports adaptive governance combining AI literacy, assessment redesign, and clear responsible-use guidelines.

Implications for Policy and Practice

As GenAI becomes embedded in academic routines, universities should replace reactive or prohibitive responses with evidence-based frameworks that protect learning quality and academic integrity.

Rather than blanket bans, institutions should define acceptable GenAI use, authorship, attribution, and AI's role as support rather than a substitute for independent thinking, communicating these rules consistently.

Assessment should also shift from vulnerable unsupervised written outputs toward authentic approaches such as oral examinations, in-class problem solving, reflection, and project-based learning.

AI literacy should train students to evaluate and verify outputs and understand model limitations. Public and private institutions should share practices and ethical standards, particularly where unequal access may deepen disparities. Mexican students value GenAI while recognizing risks to integrity and independent learning (Bittle & El-Gayar, 2025; Holzmann et al., 2025); institutions should therefore strengthen infrastructure, policy clarity, and academic integrity (Rasul et al., 2024).

Conclusion

This study shows that GenAI is embedded in Mexican students' academic practices and that productivity and learning benefits coexist with concerns about integrity, trust, and independent thinking (Plata et al., 2023; Yusuf et al., 2024). Students pursue efficiency while recognizing risks of over-reliance and reduced cognitive autonomy.

Responsible integration requires ethical use, AI literacy, and assessment redesign (Delińska & Minga, 2025; Wang et al., 2025), supported by deliberate governance and critical and ethical competencies (Smith et al., 2024) and coordinated guidelines that preserve academic rigor (Haroud & Saqri, 2025; Yusuf et al., 2024).

The Mexican context adds evidence on how institutional diversity and regulatory maturity shape adoption (Bittle & El-Gayar, 2025). The model extends technology-acceptance perspectives by showing usefulness and learning support as drivers and ethical concerns as a counterbalancing force.

Future research should examine longitudinal learning outcomes, disciplinary differences, and instructor perspectives (Jin et al., 2024) to support pedagogically sound, ethical, and socially responsible GenAI integration.

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THE FINANCIAL IMPACT OF ESG PERFORMANCE: A SYSTEMATIC LITERATURE REVIEW OF EVIDENCE FROM U.S. AND EUROPEAN MARKETS

Alexander Mezher[ab], Svetlana Sapurica[a], and Ifigenia Georgiou[a]

[a] Department of Accounting, Economics and Finance, School of Business, University of Nicosia, 46 Makedonitissas Avenue, CY-2417 Nicosia, Cyprus

[b] Corresponding author: Alexander Mezher; email: mezher.a@unic.ac.cy

Author emails: sapuric.s@unic.ac.cy (S. Sapurica); georgiou.i@unic.ac.cy (I. Georgiou)

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ABSTRACT

This systematic literature review synthesises empirical evidence on the relationship between corporate Environmental, Social, and Governance (ESG) performance and financial outcomes in U.S. and European markets. The review examines 17 peer-reviewed empirical studies published between 2014 and 2024 and analyses how ESG performance, disclosure and pillar-level dimensions relate to profitability, firm value and risk. Using a PRISMA-guided methodology, the review identifies consistent patterns, sources of heterogeneity and the mechanisms through which ESG influences financial outcomes. The findings show that ESG is generally associated with improved financial performance, although results vary across regions, sectors and measurement approaches. Governance and environmental dimensions exhibit relatively consistent positive effects, while social performance shows more mixed results. The review identifies four key mediating mechanisms - innovation, operational efficiency, risk management and reputation - and highlights moderators such as sectoral ESG materiality, regulatory context and institutional differences between the U.S. and Europe. Based on the synthesis, the paper proposes an integrative conceptual framework and outlines a future research agenda to address methodological fragmentation, measurement inconsistency and causal inference challenges. The review contributes to the ESG-finance literature by consolidating empirical findings from advanced economies, clarifying mechanisms and offering guidance for scholars, managers and policymakers seeking to understand the financial relevance of ESG in U.S. and European markets.

1. INTRODUCTION

Environmental, Social and Governance (ESG) performance has become one of the most influential themes in contemporary corporate strategy, investment decision-making, and financial research. Over the past decade, firms in advanced economies have faced increasing pressure from regulators, investors, and stakeholders to demonstrate responsible conduct, reduce environmental harm, strengthen social practices, and improve governance transparency. As ESG considerations have moved from voluntary corporate social responsibility initiatives to mainstream strategic priorities, a central question has emerged: does ESG performance enhance or hinder financial performance?

A growing body of empirical research suggests that ESG can influence firm outcomes through multiple channels, including operational efficiency, innovation, risk mitigation, and reputational benefits. Meta-analyses such as Friede et al. (2015) report that the majority of studies find a positive association between ESG and financial performance, although the magnitude and direction of effects vary across regions, sectors and methodological approaches. More recent studies highlight the importance of ESG materiality, whether ESG issues are financially relevant within a given industry, and the institutional environment in shaping the ESG performance relationship. These findings suggest that ESG is not uniformly beneficial or costly; rather, its financial relevance depends on context.

Despite the rapid expansion of ESG research, several challenges persist. First, measurement inconsistency remains a major obstacle. ESG scores differ substantially across rating agencies, disclosure frameworks and data providers, making cross-study comparisons difficult. Second, much of the literature remains correlational, leaving open questions about the mechanisms through which ESG affects financial outcomes. Third, findings often diverge between the United States and Europe, reflecting differences in regulatory environments, investor expectations, and corporate governance systems. These issues underscore the need for a systematic synthesis focused specifically on these two major markets.

This systematic literature review addresses these gaps by consolidating empirical evidence on the relationship between ESG performance and financial outcomes in U.S. and European markets. We analyse 17 peer-reviewed empirical studies published between 2014 and 2024 and examine how ESG, both as an aggregate construct and as separate environmental, social and governance pillars, relates to profitability, firm value, market performance and risk. We also identify the mediating mechanisms and moderating conditions that shape these relationships, including innovation, operational efficiency, risk management, sectoral ESG materiality and regulatory context.

This review makes three contributions. First, it provides an updated synthesis of empirical findings on ESG and financial performance in advanced economies, clarifying where results converge and where they diverge. Second, it identifies and categorises the mechanisms through which ESG influences financial outcomes, offering a more nuanced understanding of how ESG creates (or fails to create) value. Third, it proposes an integrative conceptual framework that links ESG dimensions, mediating pathways and financial outcomes while accounting for contextual moderators. This framework provides a foundation for future empirical research and offers practical insights for managers and policymakers seeking to understand the financial implications of ESG investments.

The remainder of the paper is structured as follows. Section 2 outlines the review methodology, including search strategy, inclusion and exclusion criteria and the PRISMA process. Section 3 presents the results, including descriptive characteristics of the included studies, the thematic findings and the conceptual framework derived from the synthesis. Section 4 provides a conclusion of the study discussing the implications of the findings for theory and practice.

2. METHODOLOGY

2.1 Review Protocol and Scope

This review followed a predefined protocol based on the PRISMA 2020 guidelines (Page et al., 2021), ensuring transparency, replicability and methodological rigor. The protocol established the research questions, search strategy, inclusion and exclusion criteria and data extraction procedures before the review commenced. The scope of the review was defined around empirical studies examining the relationship between ESG performance or disclosure and firm-level financial outcomes in the United States and Europe.

The decision to focus on the U.S. and European markets was grounded in both theoretical and empirical considerations. These two regions represent the most advanced ESG ecosystems globally, characterised by extensive disclosure requirements, well-developed capital markets and widespread adoption of ESG ratings. Europe has historically embraced a stakeholder-oriented governance model and has implemented mandatory sustainability reporting frameworks such as the EU Non-Financial Reporting Directive and, more recently, the Corporate Sustainability Reporting Directive (CSRD). In contrast, the United States has relied more heavily on voluntary disclosure and market-driven ESG adoption, although regulatory attention has increased in recent years through initiatives such as the SEC's proposed climate-risk disclosure rules (Christensen et al., 2021; Khan et al., 2016). These institutional differences create a natural comparative context and highlight an important gap in the literature: although many studies examine ESG in global samples, relatively few provide a focused synthesis of empirical evidence specifically comparing these two advanced economies. Concentrating on these regions therefore allows the review to address whether ESG–financial performance relationships are consistent across institutional settings or whether they vary systematically.

The review covers the period from 2014 to 2024. This timeframe was chosen because ESG measurement and reporting practices expanded substantially during this period, including the wider use of third-party ESG ratings, sustainability disclosure frameworks and sustainability-focused investment strategies. Restricting the review to this period ensures that the evidence synthesised reflects contemporary ESG practices and the data sources most widely used in current empirical research.

2.2 Search Strategy

The search strategy was designed to identify relevant empirical studies examining the relationship between ESG performance and financial outcomes in the U.S. and European markets. The research boundaries for this study were set as the following electronic database sources: (i) Scopus, (ii) Web of Science, (iii) ScienceDirect, (iv) JSTOR and (v) Google Scholar. These databases were selected because they collectively provide comprehensive coverage of management, finance, sustainability, and interdisciplinary research, and because they are widely used in systematic reviews in the ESG and corporate finance domains (Friede et al., 2015; Brooks & Oikonomou, 2018).

2.2.1 Search Terms and Query Structure

Search terms combined ESG-related expressions with financial performance terms and regional identifiers. The search strings included variations of "ESG", "environmental social governance", "sustainability performance", "financial performance", "profitability", "Tobin's Q", "stock returns", "risk", "United States", "U.S.", "Europe", "European", "United Kingdom", "Germany", "Eurostoxx" and "STOXX Europe". Searches were applied to titles, abstracts and keywords, and filters were used to restrict results to peer-reviewed journal articles published in English between 2014 and 2024.

2.2.2 Initial Search Results

The initial search across all databases identified 612 records. After removing duplicates using reference management software and manual checks, 498 unique records remained as shown in Table 1.

Table 1: Database Search Results and Duplicate Removal

Criterion applied	Records remaining
Records identified through database searching (all sources combined)	612
Records after removing duplicates	498
Records screened (title/abstract screening)	498
Records excluded after title/abstract screening	423
Full-text articles assessed for eligibility	75
Full-text articles excluded (with recorded reasons)	58
Studies included in the final synthesis (tables/figures + thematic analysis)	17

2.3 Inclusion and Exclusion Criteria

2.3.1 Inclusion Criteria

The inclusion and exclusion criteria were applied consistently during both the title and abstract screening stage and the full-text assessment stage. Studies were included if they were (1) empirical, (2) used firm-level ESG, CSR or sustainability measures, (3) reported at least one financial performance, market value or risk outcome and (4) focused on firms operating in the United States and/or Europe, or provided clearly extractable U.S. or European results within a multi-country dataset. The full list of inclusion criteria along with the operational rule is depicted in Table 2.

Table 2: Inclusion Criteria

Code	Inclusion criterion	Operational rule (what must be true to include)
INC1	Publication period	Published between 2014 and 2024 inclusive.
INC2	Language	Full text available in English.
INC3	Geographical relevance	Study focuses on firms operating in the United States and/or Europe, or reports results that are clearly extractable for U.S. and/or European firms within a multi-country dataset.
INC4	Sector scope	Study is conducted in, or provides findings relevant to, manufacturing, banking/financial services, finance/investment, logistics/supply chain, technology, or broad listed-firm samples. Multi-sector studies are eligible if U.S. or European sample information is reported or extractable.
INC5	Empirical evidence	Study is empirical and reports analyzable data/results (e.g., panel/econometric models, quasi-experiments, event analysis, machine learning, or other empirical designs).
INC6	ESG construct	ESG is measured as ESG performance, ESG score/rating, ESG disclosure, ESG reporting quality, CSR/sustainability performance, or E/S/G pillar measures.
INC7	Outcome requirement	Reports at least one outcome in scope: financial performance (e.g., ROA/ROE/EBIT), firm value/market outcomes (e.g., Tobin's Q/returns), risk/financing outcomes (e.g., volatility/cost of capital/debt risk/liquidity risk), and/or sustainability performance explicitly linked to financial outcomes.
INC8	Publication type	Peer-reviewed journal article.
INC9	Extractability	Provides sufficient methodological and results detail to code key fields (sample, measures, method, region and direction of findings).

2.3.2 Exclusion Criteria

Studies were excluded if they were (1) conceptual, (2) lacked empirical analysis, (3) focused only on countries outside the target regions without separate U.S. or European results, or (4) did not provide sufficient methodological detail to interpret the ESG-financial

performance relationship, as shown in Table 3. These criteria ensured consistency between the review title, sample selection, descriptive statistics and thematic synthesis.

Table 3: Exclusion Criteria

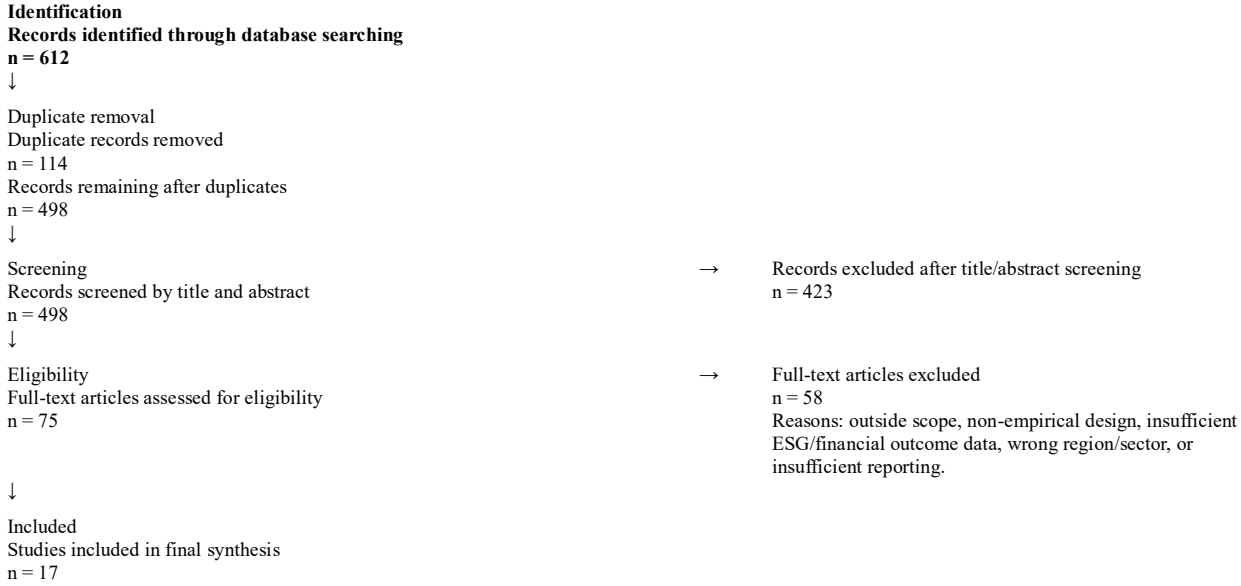
Code	Exclusion criterion	Operational rule (what triggers exclusion)
EXC1	Non-English publication	Full text is not available in English.
EXC2	Outside time window	Published before 2014 or after 2024.
EXC3	Non-empirical content	Editorials, opinion pieces, commentaries, news articles, blogs, practitioner notes, and purely conceptual papers without empirical testing.
EXC4	Topic mismatch	Does not examine ESG/CSR/sustainability performance or disclosure and does not report relevant outcomes such as financial performance, firm value, market outcomes or risk.
EXC5	Ineligible outcome/variables	ESG is mentioned only descriptively, or financial/risk outcomes are not measured/analyzed in relation to ESG.
EXC6	Insufficient reporting	Missing essential information needed for extraction, such as unclear sample, missing variable definitions, or results not reported.
EXC7	Duplicate record	Duplicate of an already retrieved study; the most complete peer-reviewed version is retained.
EXC8	Retracted/invalidated work	Retracted studies are excluded.
EXC9	Geographical mismatch	Studies are excluded if they focus only on countries or regions outside the United States and Europe, unless U.S. or European results are separately reported and extractable.

2.4 PRISMA Screening Process

The review followed the four stages of the PRISMA 2020 process: (1) identification, (2) screening, (3) eligibility and (4) inclusion. During the identification stage, 612 records were retrieved from the database searches. After duplicate removal, 498 records remained. These records were screened at the title and abstract level to assess their relevance to the research questions. Studies that did not examine ESG, did not include financial outcomes or did not focus on U.S. or European firms were excluded at this stage. This screening process resulted in the exclusion of 423 records, leaving 75 articles for full-text assessment.

Full-text screening involved a detailed evaluation of each article against the predefined inclusion and exclusion criteria. During this stage, 58 articles were excluded for reasons such as being non-empirical, lacking financial outcomes, focusing on irrelevant regions, failing to provide extractable U.S. or European results or presenting insufficient methodological clarity. The corrected final sample amounted to 17 empirical studies that met all criteria and formed the basis of the synthesis. Figure 1 presents the PRISMA-style screening process.

Figure 1. PRISMA-style screening process



2.5 Data Extraction

Data extraction was conducted using a structured form aligned with the PRISMA 2020 review logic (Page et al., 2021). For each included study, bibliographic information, regional and sectoral context, sample characteristics, ESG measurement approach, financial outcome variables, empirical methods and main findings were recorded. Particular attention was given to the type of ESG measure used, as differences in rating providers, disclosure indices and materiality indicators are known to contribute to heterogeneity in the literature (Berg et al., 2022; Gibson Brandon et al., 2021). Information on mediating mechanisms such as innovation, operational efficiency, risk management and reputation, as well as moderating factors such as sectoral ESG materiality, regulatory environment and institutional context, was also extracted.

Table 4: Summary of Data Extracted from Included Studies and Variables Recorded

Author & year	Country/region	Sector/sample	ESG measure	Financial outcome	Main finding
Eccles et al. (2014)	United States	180 U.S. companies	Sustainability policies	Stock market and accounting performance	High-sustainability firms show stronger long-term organizational and financial performance.
Flammer (2015)	United States	U.S. firms with close-call CSR shareholder proposals	CSR adoption	Announcement returns and accounting performance	Adoption of close-call CSR proposals is associated with positive announcement returns and superior accounting performance.
Khan et al. (2016)	United States	U.S. firms	Material sustainability indicators	Stock returns and accounting performance	Material sustainability issues are more strongly linked to performance than immaterial issues.

Nollet et al. (2016)	United States	S&P 500 firms	Bloomberg ESG disclosure score	ROA, ROC, excess stock returns	The ESG-financial performance relationship is nonlinear and differs across ESG dimensions.
Lins et al. (2017)	United States / North America	Non-financial firms during the financial crisis	CSR/social capital	Stock returns, profitability and growth	High-CSR firms performed better during the 2008-2009 crisis.
Velte (2017)	Germany / Europe	German listed firms	ESG performance and ESG pillars	ROA and Tobin's Q	ESG performance has a positive impact on ROA, with governance showing strong pillar-level effects.
Albuquerque et al. (2019)	United States	U.S. firms	CSR	Systematic risk and firm value	CSR is associated with lower systematic risk and higher firm value.
Buallay (2019)	Europe	European banking sector	ESG/sustainability reporting	ROA, ROE and Tobin's Q	ESG reporting is associated with banking performance, but effects differ by outcome measure.
Alareeni & Hamdan (2020)	United States	S&P 500 firms	ESG disclosure	ROA, ROE and Tobin's Q	Overall ESG disclosure positively affects performance, while sub-pillar effects are mixed.
Di Tommaso & Thornton (2020)	Europe	European banks	ESG scores	Bank risk and bank value	Higher ESG scores are associated with reduced bank risk-taking, but effects on value are mixed.
La Torre et al. (2020)	Europe	Eurostoxx50 firms	ESG index/components	Stock returns	ESG components are tested against stock return performance, with mixed market effects.
Ahmad et al. (2021)	United Kingdom / Europe	FTSE350 UK firms	ESG and ESG dimensions	Financial performance	ESG effects on UK firm performance are tested using static and dynamic panel methods.
Agoraki et al. (2023)	Europe	European listed firms	ESG reputational risk	Financial performance	Lower ESG reputational risk is linked to better performance and lower financial constraints.
D'Amato et al. (2024)	Europe	EuroStoxx-600 firms	Refinitiv ESG score	EBIT/profitability	ESG score has a significant relationship with firm profitability using machine-learning models.
Candio (2024)	Europe	STOXX Europe 600 firms	Refinitiv ESG score	Multiple financial performance measures	ESG effects are inconsistent across financial outcomes and model specifications.
Lee & Koh (2024)	United States	U.S. financial firms	ESG performance and pillars	Total, idiosyncratic and systematic risk	Composite ESG performance is negatively associated with firm risk.
Peliu (2024)	United States	NYSE-listed firms	ESG-related indicators	Debt risk and liquidity risk	ESG factors significantly influence corporate risk among NYSE-listed firms.

2.6 Coding and Analytical Approach

To support systematic comparison, the extracted data were coded into analytical categories. These categories included region, sector, ESG dimension (overall ESG or individual E, S, and G pillars), financial outcome type (profitability, firm value, or risk), direction of the ESG–financial relationship and the presence of mediators or moderators. Coding was conducted by one author and independently checked by the other two authors to ensure consistency and accuracy. Any discrepancies were resolved through discussion.

The synthesis of findings followed a two-stage approach. The first stage involved a descriptive synthesis summarizing the characteristics of the included studies, such as publication trends, regional distribution, sectoral focus, ESG measurement approaches and financial outcomes examined. The second stage involved a thematic synthesis aimed at identifying patterns in the ESG - financial relationship, the mechanisms through which ESG influences financial outcomes and the contextual factors that shape these relationships. This approach allowed the review to integrate diverse empirical findings while preserving the contextual nuances that are essential for understanding the heterogeneity observed in the literature.

3. RESULTS AND DISCUSSION

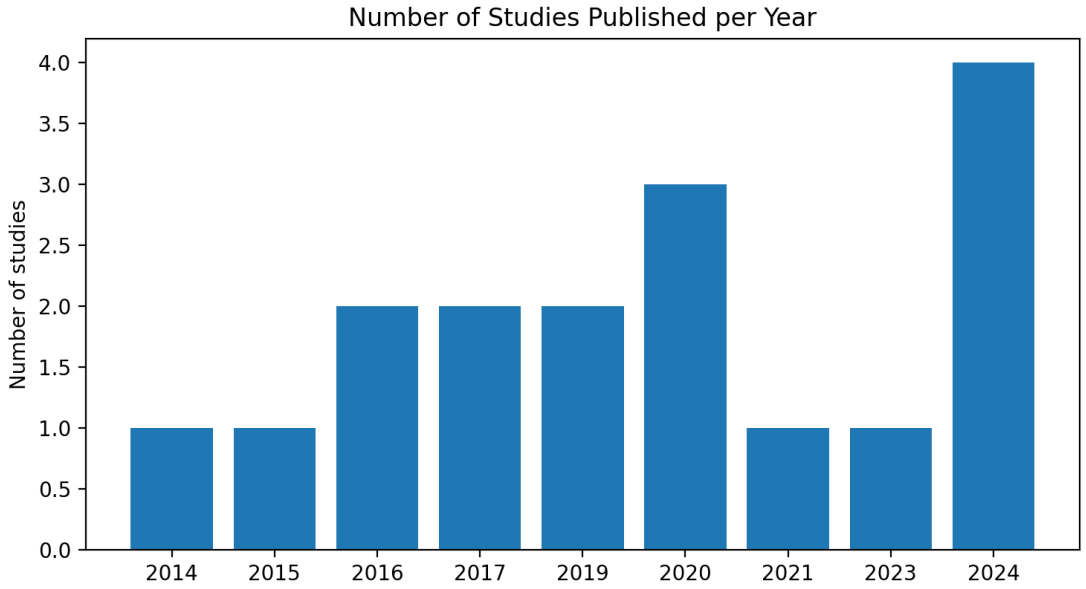
3.1 Descriptive Analysis

The descriptive analysis provides an overview of the 17 empirical studies included in the review and highlights the main characteristics of the existing literature on ESG and financial performance in U.S. and European markets. This analysis is essential for understanding the structure of the evidence base and identifying gaps that motivate the thematic synthesis presented later. The descriptive patterns observed in the literature reflect broader developments in ESG research, including the rapid expansion of sustainability reporting, the increasing availability of ESG ratings and the growing interest among investors and regulators in the financial implications of ESG performance.

3.1.1 Publication Trends Over Time

The distribution of studies across the 2014-2024 period reveals a clear upward trajectory in ESG-finance research. As shown in Figure 2, the number of empirical studies increased after 2016, with a visible concentration of studies from 2019 onward. This trend aligns with the broader surge in ESG scholarship documented by recent reviews (Berg et al., 2022; Brooks & Oikonomou, 2018), which attribute the increase to the expansion of ESG data providers, the mainstreaming of sustainable investing and the introduction of stronger sustainability disclosure initiatives in Europe and the United States. The concentration of studies in recent years indicates that ESG-finance research is a rapidly expanding field, although the evidence remains fragmented in terms of measurement consistency, causal mechanisms and cross-market comparability.

Figure 2: Number of Studies Published per Year



3.1.2 Regional Distribution of Studies

The regional distribution of the included studies reflects the geographical scope of this review, which focuses on ESG-financial performance evidence from U.S. and European markets. Studies were retained only if they examined firms operating in the United States and/or Europe, or if multi-country studies reported results that were clearly extractable for these regions. As shown in Figure 3, the corrected final sample includes eight U.S.-focused studies and nine Europe- or UK-focused studies. Studies focused solely on countries or regions outside the U.S. and Europe were excluded from the final synthesis. This correction ensures consistency between the review title, inclusion criteria, PRISMA process, descriptive statistics and thematic analysis.

Figure 3: Regional Sample Distribution of Included Studies

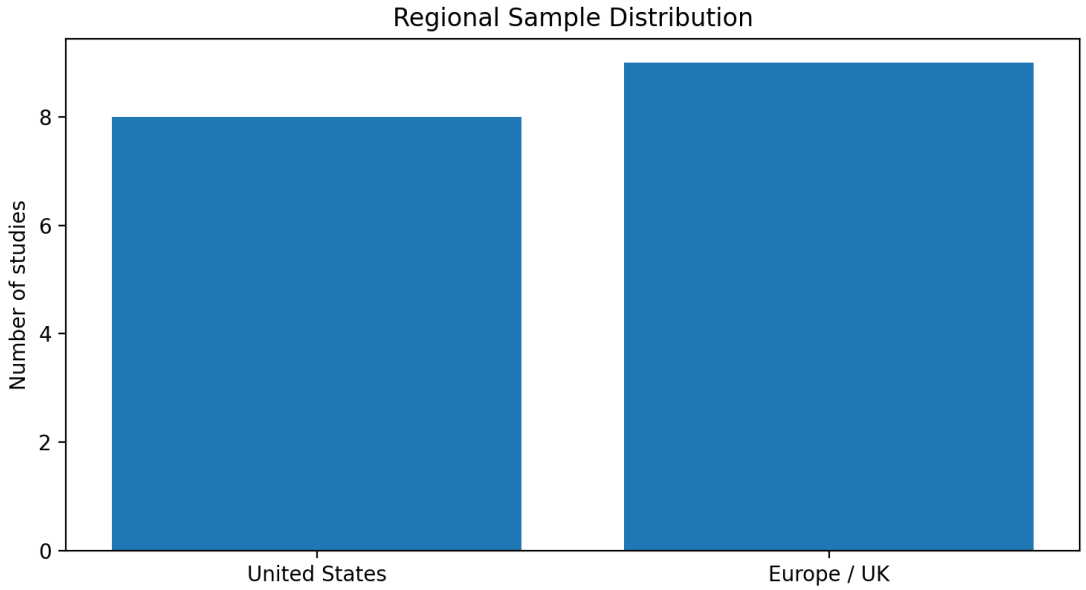
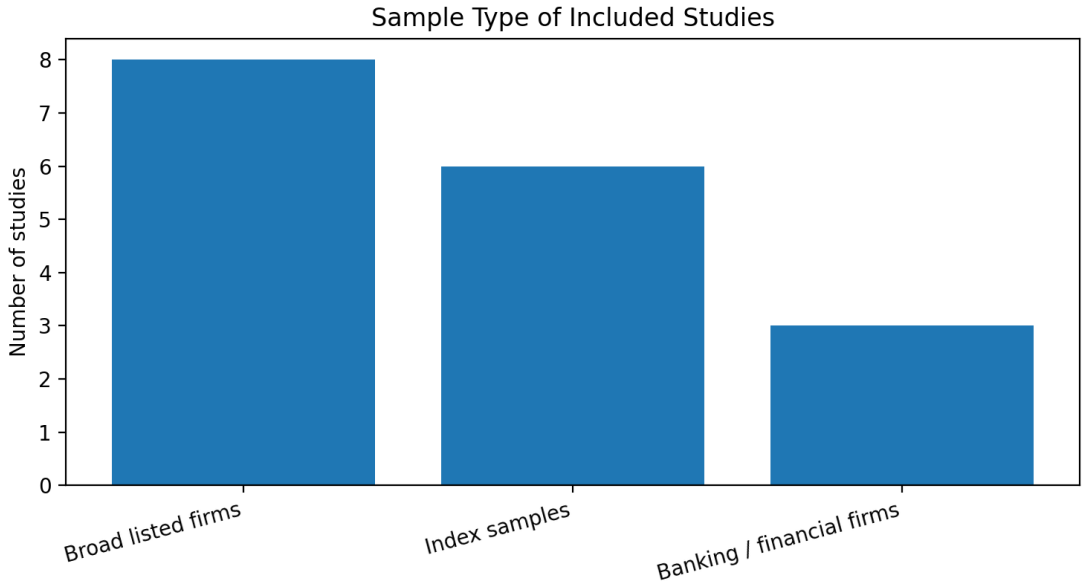


Figure 4 further classifies the included studies by sample type. The sample contains broad listed-firm studies, index-based samples such as S&P 500, FTSE350, Eurostoxx50 and STOXX Europe 600, and studies focusing specifically on banking or financial firms. This distribution is appropriate for the research question because it captures both general corporate evidence and sector-specific financial-market evidence in the two target regions.

Figure 4: Sample Type of Included Studies

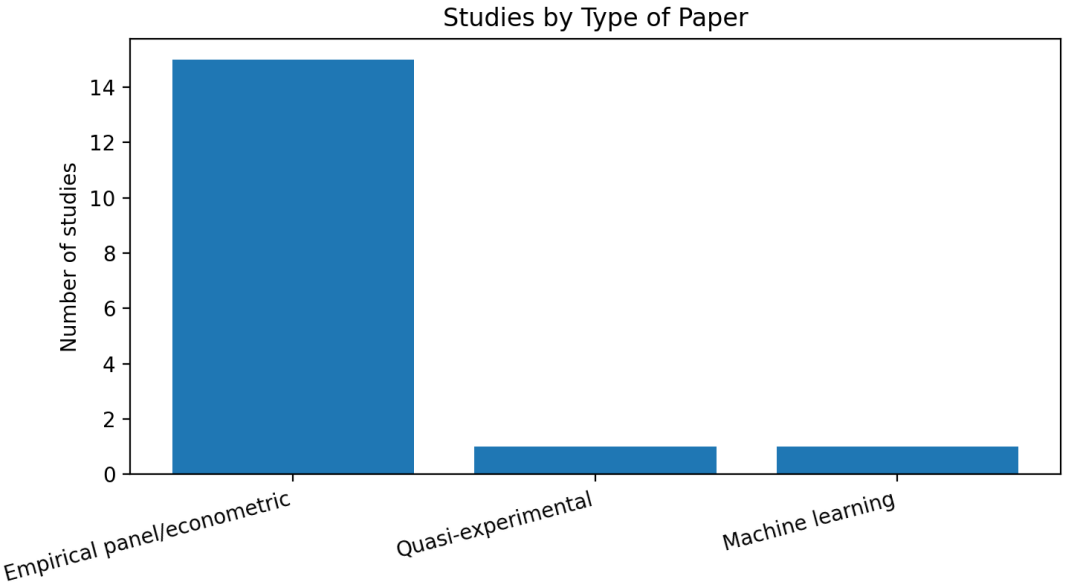


Overall, the regional and sample-type distribution confirms that the corrected evidence base is aligned with the stated U.S. and European scope of the review. This makes the subsequent synthesis more directly relevant to the institutional and regulatory contexts discussed in the introduction.

3.1.3 Study Types and Methodological Approaches

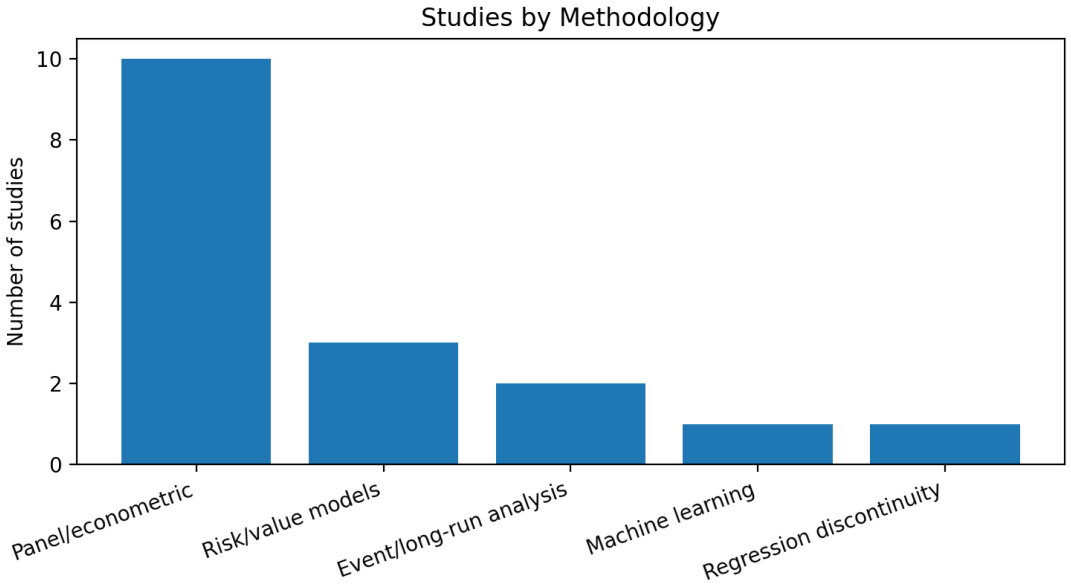
The composition of the included studies reflects the methodological diversity and evolving nature of ESG-finance research. As shown in Figure 5, most of the 17 studies use empirical panel or econometric designs, while one study uses a quasi-experimental regression discontinuity approach and one applies machine-learning techniques. This distribution indicates that the field remains predominantly driven by empirical inquiry, consistent with broader trends in ESG scholarship where researchers increasingly rely on firm-level data to examine the financial implications of sustainability performance (Berg et al., 2022; Brooks & Oikonomou, 2018).

Figure 5: Studies by Type of Paper



A closer examination of methodological approaches further illustrates the heterogeneity of the evidence base. As summarized in Figure 6, panel regression and econometric modelling are the most common approaches, appearing across studies that examine ROA, ROE, Tobin's Q, stock returns and risk-related outcomes. Other approaches include risk and value modelling in banking and financial-sector studies, long-run matched-sample analysis, regression discontinuity and machine-learning models. The presence of these approaches reflects increasing methodological sophistication as scholars seek to address endogeneity, ESG measurement error and non-linear ESG effects.

Figure 6: Studies by Methodology



Taken together, the distribution of study types and methodological approaches reveals several important gaps in the literature. The dominance of empirical studies indicates that the field has a strong quantitative base, but the variety of ESG proxies and modelling choices limits comparability across findings. In addition, although several studies use advanced or causal designs, many still rely on observational associations. Future research would benefit from more rigorous identification strategies, robustness checks across ESG data providers and clearer reporting of measurement choices.

3.1.4 Thematic Distribution of Studies

The thematic distribution of the included studies reveals the conceptual priorities that have shaped ESG research in U.S. and European markets. As shown in Figure 7, the largest thematic cluster consists of studies examining the relationship between ESG and firm performance or firm value, with seven studies falling into this category. This dominance reflects the longstanding interest in understanding whether ESG activities enhance or detract from financial outcomes, a question that continues to drive much of the empirical work in the field (Friede et al., 2015; Brooks & Oikonomou, 2018).

The second-largest thematic category focuses on ESG and risk or market outcomes. These studies examine whether ESG is associated with stock returns, systematic risk, idiosyncratic risk, bank risk-taking, debt risk or liquidity risk. This stream is particularly relevant for U.S. and European markets because ESG information increasingly affects investor decisions, cost of capital and risk management practices.

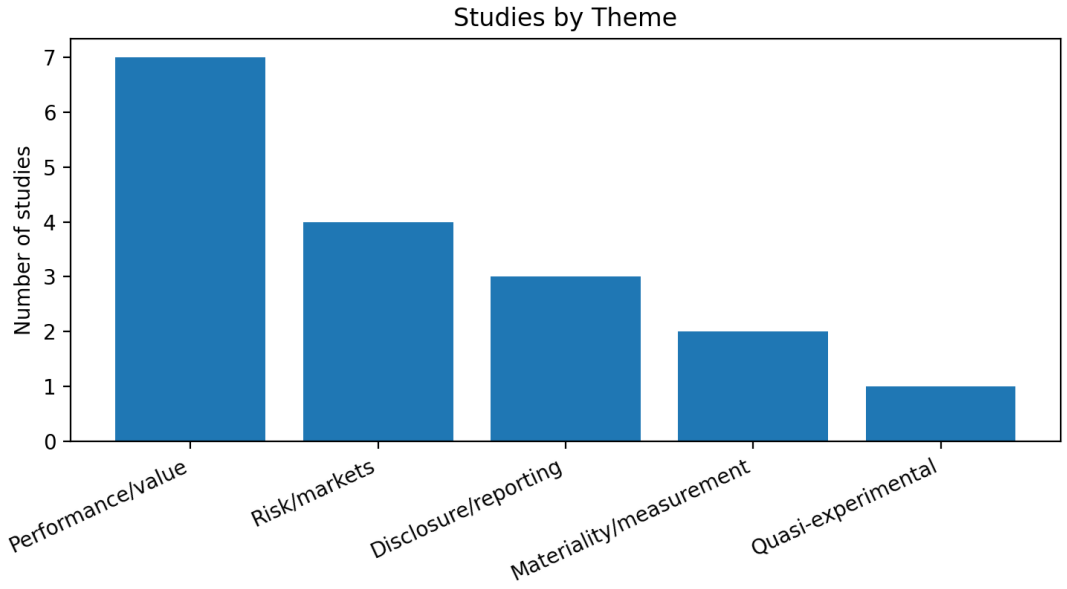
A further group of studies focuses on ESG disclosure and reporting, examining how transparency, reporting quality and sustainability communication influence firm outcomes. This theme aligns with regulatory developments such as the EU's sustainability reporting reforms and the growing attention to climate-related disclosure in U.S. capital markets (Christensen et al., 2021).

A smaller group of studies examines ESG materiality, measurement and pillar-level effects. These studies are important because they show that ESG should not be treated as a single uniform construct. Material sustainability issues, governance quality, environmental practices and social performance may influence financial outcomes differently across sectors and markets.

The remaining studies focus on long-run sustainability strategy or quasi-experimental evidence. Although smaller in number, these studies are valuable because they provide stronger insight into whether ESG-oriented policies can contribute to long-term performance rather than merely correlating with existing firm quality.

Overall, the thematic distribution reveals a literature that is heavily concentrated on the ESG-performance relationship, but increasingly attentive to risk, disclosure, materiality and causal inference. These patterns reinforce the need for a context-sensitive synthesis that distinguishes between U.S. and European institutional environments while also accounting for measurement and methodological differences.

Figure 7: Studies by Theme



3.1.5 ESG Measurement Approaches

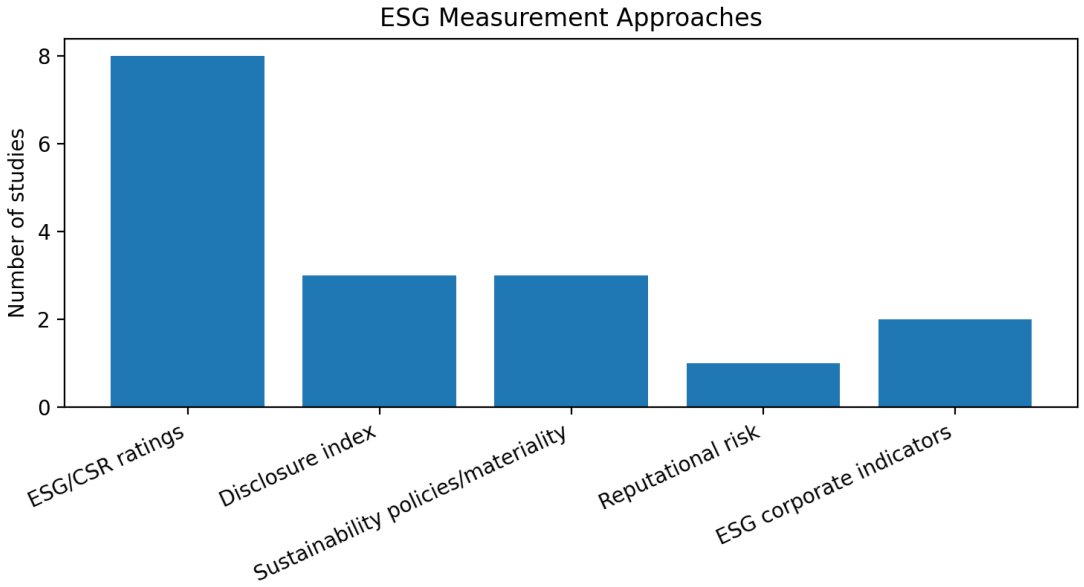
The ESG measurement practices used across the included studies reveal substantial inconsistency, reflecting one of the most widely acknowledged challenges in ESG research. As shown in Figure 8, the corrected sample includes studies using ESG or CSR ratings, disclosure indices, sustainability policy indicators, materiality-based indicators, ESG reputational risk and ESG-related corporate governance or financial indicators. This variety limits comparability across studies and contributes to the divergent findings frequently observed in the ESG-financial performance literature (Berg et al., 2022; Gibson Brandon et al., 2021).

Among the studies that specify their measurement approach, the most common method is the use of ESG or CSR ratings/scores, including rating-based measures and ESG pillar scores. Disclosure-based indices are also used, especially in studies that examine reporting quality and ESG transparency. Materiality-based indicators and sustainability-policy measures appear in studies that seek to distinguish financially relevant ESG issues from general CSR activity.

A smaller number of studies rely on reputational-risk measures or ESG-related corporate indicators such as governance, debt and liquidity variables. These approaches are useful for capturing risk channels, but they also show why ESG measurement must be interpreted carefully: different proxies may measure disclosure, actual sustainability performance, investor perception or corporate risk exposure.

Overall, the distribution of ESG measurement approaches highlights a key gap in the literature: the absence of standardized, transparent and comparable ESG metrics. This heterogeneity complicates cross-study synthesis and likely contributes to the mixed empirical results observed across U.S. and European markets.

Figure 8: ESG Measurement Approaches



3.1.6 Summary of Descriptive Findings

The descriptive analysis reveals several important patterns and gaps in the literature. First, the concentration of studies in the later years of the review period indicates that ESG-finance research has expanded rapidly, reflecting the growing availability of ESG data and the increasing importance of sustainability in corporate strategy, investment decision-making and regulatory debates. However, the reviewed literature remains fragmented across regions, themes, methodologies and measurement approaches.

The regional distribution now aligns with the stated scope of the review: the corrected final sample focuses on U.S. and European markets rather than non-target regions. Methodologically, most studies employ empirical designs, but differences in ESG data sources, model specifications and outcome measures weaken comparability across findings. This reinforces concerns about measurement inconsistency in ESG research.

Thematically, the literature remains mainly concentrated on the ESG-performance relationship, while risk, disclosure, market outcomes, materiality and measurement receive comparatively less attention. Taken together, these patterns suggest that the field is expanding but remains methodologically and conceptually fragmented. Therefore, a deeper thematic analysis is needed to clarify the mechanisms through which ESG may influence financial performance and identify the contextual factors that shape these relationships.

3.2 Thematic Analysis

The thematic analysis synthesizes the substantive findings of the 17 included studies by organizing them into six dominant themes: ESG and firm performance/value, ESG and risk/market outcomes, ESG disclosure and reporting, ESG materiality and measurement, banking and financial-sector evidence, and long-run or quasi-experimental evidence. Each theme reflects a distinct conceptual strand within the ESG literature and highlights how different research traditions contribute to understanding the financial and strategic implications of sustainability practices in U.S. and European markets.

3.2.1 Theme1: ESG and Firm Performance/Value

This theme, comprising seven studies, represents the largest body of work in the sample and reflects the longstanding academic interest in the relationship between ESG and performance. Studies in this category generally examine whether ESG activities enhance firm value, profitability or market valuation. Consistent with meta-analyses such as Friede et al. (2015) and Brooks and Oikonomou (2018), most studies in this group report a positive or conditionally positive association between ESG performance and financial outcomes, though the magnitude and significance vary across contexts.

U.S.-based studies show that sustainability practices can be associated with stronger long-term performance, superior accounting outcomes and lower systematic risk (Eccles et al., 2014; Flammer, 2015; Albuquerque et al., 2019). European studies similarly suggest that ESG performance can support profitability and firm value, although effects differ by ESG dimension, sector and modelling approach (Velte, 2017; Candio, 2024; D'Amato et al., 2024). Overall, this theme reinforces the centrality of the ESG-performance nexus but also highlights the need for more consistent measurement practices and greater attention to institutional context.

Overall, this theme reinforces the centrality of the ESG-performance nexus in the literature but also highlights the need for more consistent measurement practices and greater attention to institutional context.

3.2.2 Theme 2: ESG and Risk/Market Outcomes

The second theme includes studies examining how ESG relates to stock returns, corporate risk, bank risk-taking, debt risk and liquidity risk. In the U.S. context, ESG and CSR measures are associated with lower systematic risk and stronger crisis-period performance, suggesting that sustainability-related capabilities may operate as a risk-management mechanism (Lins et al., 2017; Albuquerque et al., 2019; Lee & Koh, 2024; Peliu, 2024).

European evidence also links ESG to risk and market outcomes, although results are sometimes mixed. Di Tommaso and Thornton (2020) find that ESG scores are associated with lower bank risk-taking, while La Torre et al. (2020) show that ESG components do not uniformly translate into stronger stock returns for Eurostoxx50 firms. These findings suggest that ESG may be more consistent as a risk-related signal than as a direct predictor of short-term market outperformance.

Overall, this theme indicates that ESG can contribute to financial stability by reducing risk exposure, improving investor confidence and lowering information asymmetry. However, the strength of this effect depends on the outcome studied, the sector, the ESG measure and the institutional environment.

3.2.3 Theme 3: ESG Disclosure and Reporting

Three studies focus on ESG disclosure and reporting, analyzing how transparency, reporting quality and sustainability communication affect firm behaviour and market responses. These studies align with regulatory developments such as the EU's sustainability reporting reforms and the growing attention to climate-related disclosure in U.S. markets (Christensen et al., 2021).

Findings generally indicate that higher-quality ESG disclosure is associated with performance benefits, although results differ by outcome measure and ESG dimension. Alareeni and Hamdan (2020), for example, find that ESG disclosure is positively associated with U.S. S&P 500 performance measures overall, while sub-pillar effects are mixed. Buallay (2019) reports that ESG disclosure is associated with European banking performance, but the direction and strength of the relationship vary across ROA, ROE and Tobin's Q. These findings show that disclosure can be financially relevant, but disclosure quality should not be treated as identical to actual ESG performance.

3.2.4 Theme 4: ESG Materiality, Measurement and Pillar-Level Effects

This theme examines whether the financial impact of ESG depends on materiality and pillar-level differences. Khan et al. (2016) provide important U.S. evidence that firms with strong performance on financially material sustainability issues outperform firms with weak performance on those issues, while immaterial sustainability performance does not show the same relationship. This finding suggests that ESG creates stronger financial effects when sustainability issues are directly relevant to the firm's business model and risk exposure.

3.2.5 Theme 5: Banking and Financial Sector Evidence

Three studies focus on banking or financial firms, providing sector-specific evidence that is highly relevant to ESG-finance debates. Buallay (2019) examines European banks and finds that ESG disclosure is associated with performance, while Di Tommaso and Thornton (2020) show that ESG scores influence European bank risk-taking and value. Lee and Koh (2024) provide U.S. evidence that ESG performance is negatively associated with total, idiosyncratic and systematic risk among financial firms. Together, these studies suggest that ESG may be especially relevant in financial sectors where risk management, reputation and regulatory scrutiny are central to firm value.

3.2.6 Theme 6: Long-run and Quasi-experimental Evidence

A smaller but important group of studies provides stronger insight into long-run or causal relationships. Eccles et al. (2014) show that high-sustainability U.S. firms exhibit stronger long-term organizational and financial performance than matched low-sustainability firms. Flammer (2015) uses a regression discontinuity approach based on close-call CSR shareholder proposals and finds that CSR adoption can lead to positive announcement returns and superior accounting performance. These studies are particularly valuable because they move beyond simple correlation and support the argument that ESG-oriented policies can contribute to financial value under certain conditions.

3.2.7 Synthesis of Thematic Patterns

Across the 17 reviewed studies, ESG is generally associated with improved financial performance, lower risk or stronger firm value, but the strength and direction of the relationship vary by region, sector, ESG dimension and measurement approach. Most studies report a positive or conditionally positive relationship between overall ESG performance and profitability indicators such as ROA, ROE or EBIT. However, the evidence is not uniform, and some studies show mixed or insignificant effects depending on the sector, model specification and ESG proxy used.

The review also shows that ESG should not be treated as a single uniform construct. Environmental practices are more directly linked to operational efficiency, cost reduction, and regulatory risk management, especially in resource-intensive sectors such as manufacturing and logistics. Social practices are more strongly connected to human capital, employee retention, stakeholder trust, and customer loyalty, particularly in service-oriented and knowledge-intensive industries. Governance practices appear especially important for risk reduction, transparency, investor confidence, and long-term financial stability.

Overall, the evidence suggests that ESG is financially material but context dependent. The ESG-financial performance relationship is stronger when ESG issues are material to the sector, when firms operate in stricter regulatory environments, and when ESG practices are linked to innovation, efficiency, reputation, or risk-management mechanisms. Therefore, the key question is not simply whether ESG improves financial performance, but how, when, and under what conditions ESG becomes financially relevant.

3.2.8 Mediators and Moderators

The studies under review employ a range of mediating and moderating variables to explain the mechanisms through which ESG influences firm outcomes, as shown in Table 5. In other words, the reviewed evidence suggests that ESG affects financial performance through several mediating mechanisms and that the strength of this relationship depends on several moderating conditions. Common mediators include innovation capability, operational efficiency, risk management, reputation and stakeholder engagement. These mediators reflect theoretical perspectives such as the resource-based view and stakeholder theory, which posit that ESG activities create value by enhancing internal capabilities or strengthening external relationships.

Moderators frequently include firm size, ownership structure, industry characteristics, materiality of ESG issues and institutional environment. For example, evidence from materiality-focused research shows that ESG effects are stronger when sustainability issues are financially relevant to the sector (Khan et al., 2016), while European banking studies suggest that regulatory and institutional context shapes ESG-risk relationships (Di Tommaso & Thornton, 2020).

These mediators and moderators clarify how and when ESG affects financial performance. ESG may improve performance indirectly by strengthening innovation, efficiency, reputation and risk management. However, the size and direction of this effect depend on the region, sector, materiality of ESG issues and regulatory environment.

Table 5: Mediators and Moderators

Type	Variable	Explanation
Mediator	Innovation	ESG can encourage firms to develop sustainable products, technologies, and processes, which may improve long-term competitiveness and financial performance.
Mediator	Operational efficiency	Environmental and governance practices can reduce waste, energy use, compliance costs, and process inefficiencies, thereby improving profitability.
Mediator	Reputation	Strong ESG performance can improve corporate reputation, stakeholder trust, and investor confidence, which may support market valuation and access to capital.
Mediator	Risk management	ESG practices can reduce regulatory, reputational, operational, and financing risks, which may improve financial stability.
Moderator	Region	The ESG–performance relationship may differ between Europe and the United States because of different regulatory systems, investor expectations, and disclosure norms.
Moderator	Sector	ESG effects vary across banking, manufacturing, logistics, technology, and other sectors because different ESG issues are financially material in different industries.
Moderator	ESG materiality	ESG has stronger financial effects when the ESG issue is directly relevant to the firm's business model and risk exposure.
Moderator	Regulatory environment	ESG effects are stronger in highly regulated contexts where disclosure, compliance, and stakeholder scrutiny are more intense.

3.3 Future Research Avenues Arising from the Reviewed Studies

Across the 17 included studies, several consistent directions for future research emerge. These avenues arise from recurring limitations, including measurement inconsistency, endogeneity, uneven sectoral coverage and limited directly comparable U.S.-Europe evidence. A central limitation in the ESG-outcomes literature is that ESG is operationalized in materially different ways, including third-party scores, disclosure indices, sustainability policy indicators, materiality indicators and risk-based measures. Future studies should therefore triangulate ESG using multiple providers where feasible, clearly justify indicator selection and weighting, and test robustness across alternative ESG proxies (Berg et al., 2022; Gibson Brandon et al., 2021).

Most empirical studies in the corrected sample identify statistically significant associations between ESG and firm performance, risk or value; however, reverse causality and omitted variables remain persistent concerns. Financially stronger firms may be more capable of adopting ESG practices, while firms with stronger governance may both disclose more ESG information and perform better. Future work should therefore use stronger identification strategies, such as instrumental variables, quasi-experimental designs, difference-in-differences models and dynamic panel specifications, to distinguish short-run associations from longer-run value creation.

Although the corrected sample now focuses on U.S. and European markets, direct comparison between the two regions remains limited. Future research should explicitly compare ESG-financial performance relationships across the U.S. and Europe, where disclosure rules, investor expectations and governance systems differ. Such work could test whether the ESG premium varies between more mandatory and more market-driven reporting environments, and whether the financial relevance of ESG differs across sectors with different material sustainability issues.

A clear future direction is to model mechanisms rather than only direct effects. Existing evidence suggests that ESG may influence outcomes indirectly by shaping operational efficiency, stakeholder trust, risk management and access to capital. Future research should test multiple mediators within integrated models and examine whether mechanisms differ by sector, for example between banking, manufacturing, technology and broad listed-firm samples.

Another important direction concerns the relationship between ESG disclosure quality, assurance and market credibility. As disclosure regulation develops, researchers should examine whether external assurance, audit quality and standardized reporting reduce greenwashing concerns and strengthen the association between ESG disclosure and financial outcomes. This is especially important in Europe, where sustainability reporting regulation is more advanced, and in the United States, where ESG disclosure remains more market-driven.

A subset of reviewed studies examines market outcomes such as volatility, risk, returns and valuation. Future research can broaden this work by testing ESG effects across different market conditions, including crisis versus stable periods, different investor types and different financial instruments such as equity, debt and ESG-linked credit products.

These avenues directly motivate the structure of the results chapters that follow. Specifically, the present review's descriptive profiling and thematic synthesis are designed to clarify how ESG is measured across U.S. and European studies, map dominant outcome types and methods, identify recurring mechanisms and boundary conditions, and translate these gaps into a coherent conceptual framework and targeted future research agenda aligned with the review objectives.

3.4 Conceptual Framework Derived from the Reviewed Studies

The synthesis of the 17 studies reveals that the relationship between ESG and firm outcomes is neither linear nor uniform. Instead, the evidence points to a multi-layered system of causal pathways, where ESG, whether measured as a composite score or as separate E, S and G pillars, affects firm performance through a set of organisational and market-based mechanisms. These mechanisms are shaped by contextual and methodological conditions, including industry structure, institutional environments and the specific ESG measurement approach employed. The conceptual framework (Figure 9) integrates these insights into a structured model comprising inputs, mediators, moderators and outcomes, reflecting the dominant patterns observed across the reviewed literature.

3.4.1 Inputs: ESG Constructs and Measurement Approaches

Across the reviewed studies, ESG is operationalised in several ways: externally produced ESG ratings, disclosure-based indices, sustainability policy indicators, materiality-based measures and ESG-related risk indicators. This distinction is not merely methodological; it materially shapes the observed ESG-outcome relationships. Studies using disclosure indices often examine transparency and information effects, while studies using ESG ratings or materiality indicators tend to examine underlying performance, risk and value implications. This aligns with broader evidence that ESG ratings diverge substantially due to differences in scope, weighting and data collection (Berg et al., 2022; Gibson Brandon et al., 2021).

The framework therefore treats ESG measurement as a foundational input rather than a technical detail. Measurement choices influence effect sizes, directionality and comparability across studies, making them a central determinant of empirical outcomes.

3.4.2 Mediators: Transmission Channels Linking ESG to Outcomes

The reviewed studies consistently identify three dominant mediating mechanisms through which ESG influences firm outcomes: (1) operational efficiency, innovation and strategic capability, (2) reputation, legitimacy and stakeholder trust and (3) governance quality, risk management and information transparency.

Innovation, Digital Transformation and Operational Efficiency

Multiple studies show that ESG-oriented firms can exhibit stronger long-term capabilities, improved operational processes and better financial outcomes (Eccles et al., 2014; Flammer, 2015; D'Amato et al., 2024). These mechanisms align with the resource-based view, suggesting that ESG practices may enhance internal capabilities that subsequently improve performance.

Reputation, Legitimacy and Stakeholder Attention

Several studies highlight the role of corporate reputation and stakeholder legitimacy as mediators. ESG performance can increase investor confidence, strengthen corporate reputation and improve access to capital, which in turn affects market valuation and risk exposure (Lins et al., 2017; Albuquerque et al., 2019; Agoraki et al., 2023). This reflects stakeholder theory, where ESG serves as a signal of responsible management.

Governance Quality and Information Transparency

Governance-related ESG mechanisms, including improved reporting quality, reduced information asymmetry and stronger internal controls, also mediate ESG effects. These mechanisms reduce risk, enhance credibility and improve investor confidence, especially in regulated sectors such as banking and financial services (Buallay, 2019; Di Tommaso & Thornton, 2020; Lee & Koh, 2024).

Together, these mediators illustrate that ESG creates value indirectly, by shaping firm capabilities and stakeholder perceptions rather than acting as a direct performance driver.

3.4.3 Moderators: Boundary Conditions Shaping ESG Effects

The reviewed studies identify two broad categories of moderators that condition the ESG–outcome relationship (1) Contextual Moderators and (2) Measurement Moderators.

Contextual Moderators

These include industry characteristics, regulatory environments, and institutional settings. For example, ESG effects tend to be stronger in regulated industries, in firms operating under stricter disclosure regimes, or in institutional contexts with high stakeholder expectations. This aligns with institutional theory, which emphasises the role of external pressures in shaping ESG outcomes.

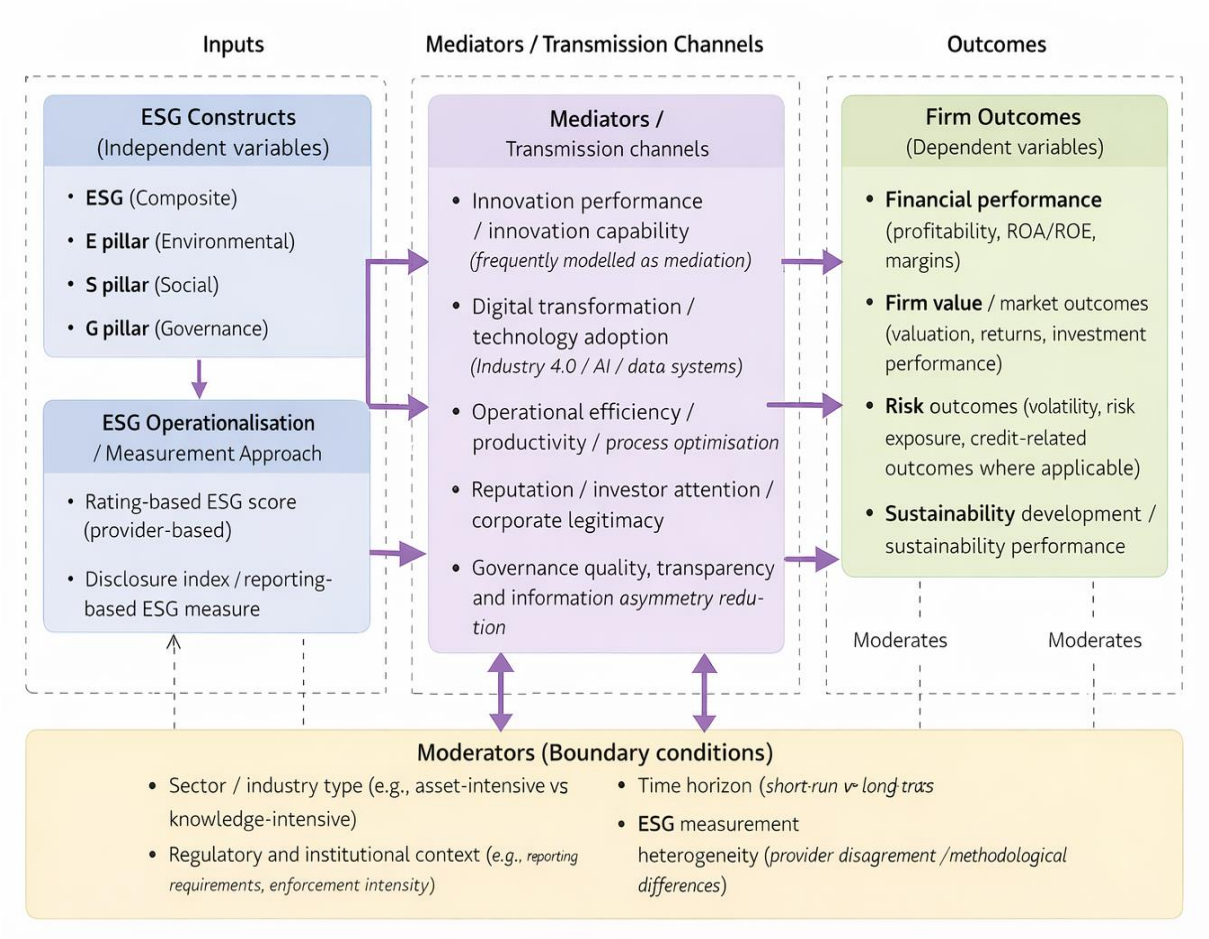
Measurement Moderators

Differences in ESG proxies, including ratings versus disclosure indices and composite versus pillar-level measures, moderate the observed relationships. Studies using different ESG providers or proxies often report divergent results, reflecting the well-documented issue of ESG rating disagreement (Berg et al., 2022; Gibson Brandon et al., 2021). This reinforces the need for robustness checks and transparent reporting of measurement choices.

These moderators highlight that ESG effects are situational, varying across sectors, institutional contexts, and measurement systems.

3.4.4 Outcomes: Financial, Market, Risk, and Sustainability Performance

The dependent variables reported across the studies fall into four main categories: (1) financial performance (ROA, ROE, profitability), (2) firm value and market outcomes (valuation, returns, investor reactions), (3) risk-related outcomes (volatility, credit risk, downside risk) and (4) sustainability development/performance. The evidence suggests that ESG effects are not uniform across these outcomes. Some studies report positive financial and market effects, while others find neutral or context-dependent results. Risk-related outcomes tend to show more consistent benefits, aligning with research suggesting that ESG reduces firm-level risk exposure (Gibson & Krueger, 2021). Sustainability outcomes are generally positive but vary depending on the ESG dimension emphasised.



4. CONCLUSION

4.1 Key Findings

This study synthesised evidence from 17 empirical studies examining the relationship between ESG and firm-level outcomes in U.S. and European markets. The findings reveal a literature that is expanding rapidly but remains fragmented across methodologies and measurement practices. The descriptive analysis showed that the corrected final sample is distributed across U.S. and European contexts, making it consistent with the title and stated scope of the review. Methodological transparency is stronger in the corrected sample than in the previous version, although ESG measurement practices still vary widely across rating-based scores, disclosure indices, materiality indicators and risk-related proxies. This reinforces concerns about measurement divergence highlighted by Berg et al. (2022) and Gibson Brandon et al. (2021).

The thematic analysis identified six dominant research streams: ESG and firm performance/value, ESG and risk/market outcomes, ESG disclosure and reporting, ESG materiality and measurement, banking and financial-sector evidence, and long-run or quasi-experimental evidence. Across these themes, the evidence suggests that ESG influences firm outcomes primarily through indirect organisational and market-based mechanisms. These include operational efficiency, innovation capability, corporate reputation, stakeholder trust, risk management and governance-driven transparency.

The conceptual framework developed from the reviewed studies integrates these insights into a structured model comprising inputs, mediators, moderators and outcomes. ESG inputs include both rating-based and disclosure-based measures, which differ in scope and methodological assumptions. Mediators capture the organisational and market channels through which ESG exerts influence, while moderators, such as industry characteristics, regulatory environments, institutional pressures and measurement heterogeneity, shape the strength and direction of ESG effects. Outcomes span financial performance, firm value, risk reduction and sustainability development. The framework demonstrates that ESG effects are situational, measurement-dependent and mechanism-driven, explaining the mixed findings observed across the literature.

4.2 Implications

The findings have several theoretical and practical implications. Theoretically, the review reinforces the relevance of stakeholder theory, showing that ESG enhances legitimacy, reputation and investor confidence, which in turn influence market valuation and access to capital. The resource-based view is also supported, as ESG practices contribute to internal capabilities, including innovation, operational efficiency and long-term strategic resilience. Institutional theory is reflected in the moderating role of regulatory and institutional environments, particularly in the differences between U.S. and European disclosure systems. Finally, the review highlights

the importance of ESG measurement as a theoretical and methodological construct, demonstrating that measurement heterogeneity is not merely a technical issue but a determinant of empirical results.

Practically, the findings suggest that firms should view ESG not only as a compliance exercise but as a strategic tool for capability development and stakeholder engagement. Managers should prioritise investments in governance quality, operational efficiency, credible disclosure and risk management, as these are the mechanisms through which ESG is most likely to create value. For investors, divergence in ESG ratings underscores the need to evaluate the underlying measurement approach rather than relying solely on composite scores. For policymakers, the inconsistency in ESG measurement highlights the need for standardized reporting frameworks and credible assurance mechanisms that improve comparability across firms and markets.

4.3 Future Research Directions

The review identifies several promising avenues for future research. First, more explicitly comparative ESG research is needed across U.S. and European markets, where regulatory environments, investor expectations and institutional pressures differ significantly. Second, future studies should address persistent measurement heterogeneity by comparing rating-based, disclosure-based and materiality-based ESG measures. Third, more research is needed to unpack the mechanisms through which ESG creates value, particularly the roles of operational efficiency, innovation, reputation, risk management and governance quality. Fourth, future studies should systematically test boundary conditions, including industry type, regulatory intensity, institutional context and time horizon. Fifth, there is a need for longitudinal and causal research designs, including quasi-experimental approaches, to identify causal pathways and address endogeneity concerns. Finally, the conceptual framework developed in this study provides a foundation for future empirical testing in U.S. and European contexts.

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SUSTAINABILITY CO-BENEFITS OF INNOVATIVE STRATEGIC PRACTICES IN AGRARIAN MSMEs: A CONCEPTUAL FRAMEWORK FOR EMERGING ECONOMIES

Oluremi Noah ILUYOMADE
Unicaf University in Malawi

Adebayo John Julius
University of East London

Keywords: Innovative strategic practices, Agrarian MSMEs, Sustainability co-benefits, Dynamic capabilities, Emerging economies, Enterprise performance.

Extended Abstract

Agrarian micro, small, and medium-sized enterprises (MSMEs) are central to food security, rural employment, and local value creation in emerging economies. However, sustainability research and policy often treat them as recipients of external sustainability requirements rather than as strategic actors capable of generating sustainability outcomes through ordinary enterprise practice. Existing innovation, dynamic capabilities, and sustainability studies show that innovation can support sustainable performance, but they give less attention to how resource-constrained agrarian MSMEs convert routine strategic adjustments into economic, social, and environmental co-benefits (Mayrhofer and Gupta, 2016). This paper is guided by the following research question: How do innovative strategic practices enable agrarian MSMEs in emerging economies to generate sustainability co-benefits under resource-constrained conditions?

The purpose of this conceptual paper is to explain how agrarian MSMEs generate sustainability co-benefits through innovative strategic practices. The paper develops a dynamic capabilities-based sustainability co-benefits framework by synthesising dynamic capabilities theory (Teece, 2007), co-benefits literature, SME green-growth research (Putri et al., 2025), and sustainable food value-chain thinking (FAO and UNIDO, 2024). It focuses on five practice areas: value-chain adaptation, input optimisation, market repositioning, organisational learning, and collaborative knowledge use across production, market, and support-system relationships. These practices are important because many agrarian MSMEs operate with limited finance, weak infrastructure,

unstable markets, and rising environmental uncertainty. Under these conditions, sustainability may not begin as a formal programme. It may emerge when firms adapt how they use resources, organise routines, connect to markets, learn from local actors, and respond to constraints.

The proposed framework explains this process through four linked components. The logic is practice-led: agrarian MSMEs need not depend on advanced technology, formal reporting systems, or large-scale research and development investments to contribute to sustainability. Instead, it examines how small adjustments in production, sourcing, learning, market access, and collaboration can accumulate into broader co-benefits when strategically organised. First, innovative strategic practices provide the practical starting point for enterprise adaptation. Second, these practices activate dynamic capability mechanisms by helping firms sense constraints, seize available opportunities, and reconfigure routines. Third, these mechanisms strengthen enterprise performance and resilience by enhancing income stability, adaptability, operational continuity, and response capacity. Fourth, sustainability co-benefits emerge through resource efficiency, local employment support, environmental adaptation, and livelihood security. The framework, therefore, differs from generic innovation-sustainability models in three ways: it begins with practice-level strategic adjustments, connects dynamic capabilities to routine agrarian MSME activities, and treats sustainability co-benefits as outcomes that emerge alongside enterprise performance rather than as separate compliance outputs.

The paper contributes to SME and sustainability scholarship by shifting the argument from whether innovation supports sustainability to how agrarian MSMEs generate co-benefits through specific practices and capabilities. Its originality lies in positioning sustainability as an outcome of enterprise adaptation and capability development in resource-constrained agrifood systems. In practice, the framework suggests that enterprise-support interventions should strengthen the practices that build capability, including resource-efficiency training, value-chain coordination, market information, peer learning, adaptive routines, appropriate finance, and local innovation platforms. These interventions can help agrarian MSMEs improve viability while contributing to wider sustainability goals, especially where public support systems are limited, and enterprises must build resilience through everyday decisions. As a conceptual paper, the framework requires empirical validation across agrarian sectors, enterprise sizes, institutional settings, market structures, and country contexts. Future studies can test which practices generate the strongest co-

benefits, where trade-offs arise, and under what institutional or market conditions the framework is most useful.

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DESIGN SCIENCE AND HUMAN-AI COMPLEMENTARITY IN HUMAN RESOURCE MANAGEMENT: A METHODOLOGICAL ARCHITECTURE FOR AUGMENTED LEARNING AND GOVERNANCE

Oluremi Noah Iluyomade
Department of Business Administration, Unicaf University, Malawi
Adebayo John Julius
School of Architecture, Computing and Engineering, University of East London, United Kingdom

Keywords: Artificial intelligence, Human-AI complementarity, Design science research, Human resource management, Governance, AI-augmented learning.

Abstract

AI-augmented human resource management (HRM) requires systems that are designed, governed, evaluated, and iteratively adapted. This paper argues that AI-HRM scholarship needs to move beyond retrospective empirical validation and engage more directly in proactive, design-oriented inquiry.

Rather than treating AI-enabled HRM systems as static technologies or exogenous variables, this paper positions them as socio-technical artefacts. It develops a Design Science Research (DSR) architecture for studying and designing human-AI complementarity in HRM, organised into four layers: problem framing, artefact design, human governance, and evaluation with iterative learning.

The contribution is both methodological and practical. It shows how HRM scholars can translate complementarity, discretion, accountability, and learning into design requirements, governance mechanisms, and evaluation criteria. The framework also supports the allocation of decision rights, the preservation of human judgement, and the development of AI-supported HRM processes that remain transparent, contestable, and human-centred.

Introduction: The Methodological Challenge of AI in HRM

The rapid diffusion of artificial intelligence (AI) across human resource management (HRM) has generated substantial research on efficiency, fairness, employee perceptions, algorithmic HRM, and adoption outcomes (Jaiswal et al., 2022; Meijerink et al., 2021; Tursunbayeva et al., 2018). This literature offers valuable descriptive and explanatory insights, but devotes less sustained attention to the methodological challenges posed by AI-enabled HRM systems (systems which are not static variables to be measured after implementation, but rather evolving socio-technical artefacts that require deliberate design, governance, evaluation, and adaptation).

The methodological gap is particularly evident in debates about human-AI complementarity. In this literature, complementarity frames AI as a mechanism for augmentation rather than as a substitute for human judgement (Raisch and Krakowski, 2021). However, complementarity does not arise automatically from adopting AI tools. It emerges through interactions among human actors, algorithmic systems, organisational rules, and feedback routines, making it dynamic, context-dependent, and difficult to capture through static research designs alone.

Current AI-HRM scholarship continues to rely heavily on backwards-looking methods that assess outcomes after adoption. These approaches can identify associations between AI use and organisational outcomes; however, they offer limited guidance on how AI-HRM systems should be designed to support learning, preserve discretion, and maintain accountability. This methodological misalignment limits both theoretical development and practical utility.

This paper responds by proposing a shift from empirical validation alone toward design-oriented inquiry. It uses Design Science Research (DSR) to develop a methodological architecture for the design, governance, and evaluation of AI-augmented HRM systems. In doing so, the paper reframes AI-HRM as a design problem and positions human-AI complementarity as a design orientation that can be translated into artefact features, governance mechanisms, and evaluation criteria.

Limits of Dominant Empirical Approaches in AI-HRM Research

Empirical research remains a methodological backbone of HRM scholarship. It provides essential tools for hypothesis testing, theory validation, and the analysis of organisational outcomes. However, its limits become more apparent when researchers need to examine the internal design orientation of algorithmic systems in AI-driven environments.

A first concern is that AI is often treated as an exogenous input, measured by adoption indicators, usage intensity, or employee attitudes (Tursunbayeva et al., 2018). This framing can obscure the design decisions embedded in AI systems, including the feedback mechanisms, interface structures, and governance arrangements that shape organisational outcomes. When technological opacity remains unexamined, the interaction between algorithmic logic and human agency is also under-specified.

Temporality introduces a second limitation. AI-enabled HRM systems are not static installations; they evolve through use, retraining, contextual adjustment, and organisational learning. Cross-sectional surveys and static datasets capture snapshots of these systems, but they offer limited insight into how specific design choices produce effects or unintended consequences over time. This matters for the automation-augmentation paradox, in which the same technology may support or undermine human capability, depending on how it is designed and governed (Raisch and Krakowski, 2021).

Prescriptive utility is another constraint. Statistical associations between AI adoption and performance may indicate a relationship, but they rarely explain how managers should structure systems to support reflective learning, preserve professional discretion, and reduce risks such as automation bias or deskilling (Jaiswal et al., 2022). The issue is not that empirical inquiry has become obsolete. Rather, these limits point to the need for a complementary methodological approach that foregrounds design, iteration, and proactive evaluation.

Design Science Research as a Methodological Response

Design Science Research (DSR) originates in information systems scholarship, where it focuses on the purposeful creation and evaluation of artefacts that address organisational problems within real-world constraints (Hevner et al., 2004). Its relevance to AI-augmented HRM stems from this design orientation. Rather than explaining phenomena only after they occur, DSR asks how systems should be designed to achieve desired outcomes in complex and evolving contexts.

AI-enabled HRM systems are inherently socio-technical. They embed assumptions about learning, discretion, control, fairness, and accountability, and they evolve through continuous interaction between human actors and algorithmic components. Traditional empirical approaches, particularly cross-sectional and variable-centred designs, often struggle to capture

these dynamics. DSR addresses this limitation by accommodating cycles of problem identification, artefact design, evaluation, and refinement (Peffers et al., 2007).

This does not mean that DSR displaces empirical methods such as surveys, interviews, experiments, or performance metrics. Instead, it repositions them within a broader design orientation, shifting their role from hypothesis testing alone to artefact refinement, governance assessment, and evaluative learning. In this way, HRM research can integrate rigour and relevance rather than treating them as competing methodological priorities.

For AI-HRM research, DSR is particularly useful because it translates abstract constructs into design requirements. Human-AI complementarity, learning augmentation, discretion, and accountability can be specified as artefact features, governance mechanisms, and evaluation criteria (Teeni et al., 2023). This enables researchers to conceptualise AI systems as designable socio-technical artefacts rather than as external technologies whose consequences are measured only after implementation.

Human-AI Complementarity as a Design Logic

Human-AI complementarity has become a central lens for discussions of artificial intelligence, work, and management. It emphasises augmentation, mutual reinforcement, and the redistribution of tasks between human and algorithmic actors (Hemmer et al., 2025; Raisch and Krakowski, 2021). In HRM, the concept challenges the view that AI should replace human judgement and instead directs attention to how AI systems can enhance human sense-making, learning, and decision quality.

When complementarity is treated merely as an aspiration or outcome, its design basis remains underdeveloped. It is not an inherent property of AI technologies; it is shaped by choices regarding algorithm training, interface design, feedback structuring, discretion allocation, and the embedding of human oversight within decision processes (Teeni et al., 2023). Treating complementarity as a design orientation, therefore, shifts attention from adoption outcomes to the architectural principles that shape human-machine interaction over time.

This orientation aligns with HRM's normative commitments to developmental learning, ethical management, and contextual judgement. Rather than assuming a fixed balance between human and machine contributions, it recognises that this balance shifts as organisational contexts change and actors learn to interpret, challenge, and repurpose AI

systems. That dynamic quality poses challenges for traditional empirical approaches, which often rely on stable constructs and static relationships.

Design-oriented inquiry addresses the problem by treating iteration, adaptation, and evaluation as central to knowledge production (Hevner et al., 2004; Peffers et al., 2007). The key methodological question is therefore not merely whether AI works in HRM, but whether a given design configuration sustains productive human-AI interaction while safeguarding human agency and organisational accountability. This reframing provides the conceptual foundation for the architecture developed below.

A Design Science Architecture for AI-Augmented HRM

This section develops a Design Science architecture for AI-augmented HRM. It provides a methodological template for designing, evaluating, and governing AI-enabled HRM systems as socio-technical artefacts, rather than treating them as black-box technologies or isolated variables.

Consistent with DSR, the architecture is organised into four interrelated layers: problem framing, artefact design, human governance, and evaluation with iterative learning (Hevner et al., 2004; Peffers et al., 2007). These layers operationalise human-AI complementarity as a methodological objective while accommodating contextual variation and system evolution.

Design layer	Core design question	HRM application example	Governance mechanism	Evaluation criterion
Problem framing	What HRM problem requires AI augmentation?	Recruitment bias, inconsistent feedback, or limited learning support	Stakeholder problem validation	Relevance, ethical fit, and problem clarity
Artefact design	What AI-supported artefact should be designed?	Screening support tool, performance dashboard, or learning recommendation system	Human-in-the-loop design	Usability, interpretability, and contextual fit
Human governance	Who retains decision rights and accountability?	HR manager override, escalation pathway, or employee appeal mechanism	Accountability matrix and discretion rules	Preservation of human judgement and contestability
Evaluation and iterative learning	How should the artefact be assessed and refined?	Hiring outcome review, appraisal calibration, or learning feedback cycle	Periodic review and redesign cycle	Learning quality, fairness, agency, and adaptive improvement

Table 1: Design Science Architecture for AI-Augmented HRM

The examples in Table 1 are illustrative rather than exhaustive; they show how the architecture can be adapted across HRM functions.

HRM practice example: In recruitment, an organisation may deploy an AI screening tool to identify candidate-job fit and highlight potential bias risks. The tool generates a ranked shortlist and diagnostic explanations, but HR managers retain final decision rights, document any override, and provide an escalation pathway when recommendations appear inconsistent or unfair. Candidates can request clarification or appeal decisions through a defined review channel. Periodic audits then compare shortlist and hiring outcomes across relevant demographic and qualification profiles, feeding back into model redesign, criteria adjustment, and HR manager training. In this configuration, AI supports pattern recognition and learning, while human actors preserve judgement, accountability, and contestability.

Problem framing and design objectives

The architecture begins with problem framing, which establishes the scope, relevance, and normative orientation of the design effort. In AI-augmented HRM, the problem to be addressed is rarely technical in isolation. It typically involves organisational and behavioural challenges such as inconsistent decision-making, limited capacity for feedback, biased recruitment practices, or constrained learning resources.

Within this layer, human-AI complementarity functions as a normative design objective. The aim is not to optimise automation for its own sake, but to enhance human sense-making, judgement, and adaptive capacity. In this way, the layer aligns methodological intent with HRM's developmental and ethical foundations (Raisch and Krakowski, 2021).

Artefact design: AI systems as socio-technical constructs

The second layer focuses on artefact design. Here, AI systems are treated as socio-technical constructs that shape how organisational actors generate, interpret, and act on information. In HRM, these artefacts may include decision-support tools for recruitment, performance dashboards for managers, and learning recommendation systems for employees.

Complementarity requires authority to be deliberately distributed between human and algorithmic actors. AI artefacts should surface patterns, generate alternatives, and support reflective judgement rather than impose unexamined decisions. For this reason, interfaces need to be intelligible and contestable, allowing users to interrogate algorithmic recommendations rather than merely comply with them (Teeni et al., 2023).

Human governance and oversight mechanisms

The third layer concerns governance. In AI-augmented HRM systems, governance defines how decision rights, accountability, and discretion are allocated. Without explicit governance, complementarity can collapse into automation bias, uncritical reliance on algorithmic outputs, or weakened professional accountability (Raisch and Krakowski, 2021).

Governance mechanisms may include manager override rights, escalation pathways, audit trails, employee appeal mechanisms, and periodic review of model outputs. These mechanisms are methodologically significant rather than ancillary, because they allow researchers to examine how design choices shape human agency, responsibility, and trust over time.

Evaluation and iterative learning

The fourth layer focuses on evaluation and iterative learning. Rather than treating evaluation as a narrow test of technical accuracy or efficiency, this layer extends assessment to learning enhancement, preservation of human agency, fairness, transparency, and alignment with organisational values (Hevner et al., 2004). Evaluation outcomes then guide subsequent design iterations, enabling artefacts and governance arrangements to be refined continuously.

This cyclical logic positions evaluation as an ongoing methodological activity rather than a terminal validation step. For instance, assessment using a recruitment support tool would consider prediction accuracy, the quality of human review, the transparency of shortlist decisions, and applicants' or HR managers' ability to challenge problematic recommendations. A learning recommendation system can be assessed comparably, with attention to its contribution to employee development rather than solely on platform engagement metrics.

Methodological outputs and contribution

The architecture produces three methodological outputs for AI-HRM research. At the design level, it translates human-AI complementarity into explicit design requirements. It also provides a governance schema for allocating decision rights, oversight responsibilities, and accountability mechanisms. Finally, the architecture establishes an iterative evaluation cycle that links artefact performance to learning, fairness, discretion, and redesign.

Together, these outputs help HRM researchers move beyond asking whether AI adoption produces positive or negative effects. They support inquiry into how AI-HRM systems should

be designed, governed, and refined so that augmentation remains aligned with human capability and organisational responsibility.

Methodological Governance and Evaluation

DSR treats evaluation and governance as integral components of methodological rigour. In AI-augmented HRM, governance is not only an ethical or managerial concern; it is also a methodological requirement that shapes whether complementarity is sustained or undermined over time.

Governance as a methodological concern

Without deliberate governance mechanisms, the redistribution of tasks and authority within AI-augmented HRM systems can lead to automation bias, diminished accountability, or an uncritical reliance on algorithmic outputs. From a design science perspective, these outcomes are design failures rather than mere implementation problems.

The proposed architecture treats governance as a designable component of the research artefact. Decision rights, escalation pathways, audit routines, transparency requirements, and contestability mechanisms should therefore be specified and evaluated. This makes it possible to examine how governance arrangements preserve human agency and responsibility, rather than assuming that these qualities will, by default, survive AI implementation (Bujold et al., 2023; Papagiannidis et al., 2025; Teeni et al., 2023).

Governance mechanisms must also remain sensitive to organisational context. Appropriate oversight varies across institutional settings, regulatory environments, and HRM functions. Design-oriented inquiry accommodates this variability by allowing governance arrangements to be adapted and re-evaluated through iterative design cycles (Hevner et al., 2004).

Evaluation beyond technical performance

Predictive accuracy, processing speed, and efficiency gains remain relevant technical performance metrics. However, their usefulness is limited when the question is whether AI systems enhance human capacity. Evaluation should therefore examine support for human sense-making, reflective judgement, meaningful discretion, fairness, and organisational learning (Tursunbayeva et al., 2018).

When evaluation is embedded within iterative design cycles, researchers can identify unintended consequences such as over-reliance on recommendations, erosion of skills,

reduced transparency, and inappropriate transfer of accountability to algorithmic systems. Qualitative feedback, observational insight, audit data, and performance metrics can then be combined to provide a richer account of system effectiveness.

Implementation challenges in organisational settings

Implementing this architecture may encounter several organisational constraints. AI-enabled HRM systems depend on data quality, explainability, managerial capability, and users' willingness to engage critically with algorithmic outputs (Lee et al., 2023). In practice, complementarity can be undermined by opaque models, weak audit trails, unclear accountability, employee resistance, or regulatory uncertainty. These challenges reinforce the need to treat governance and evaluation as recurring design activities rather than one-off implementation safeguards. Implementation risks should therefore be monitored through recurring governance reviews and evaluation cycles rather than treated as one-off deployment issues.

Iterative learning and methodological rigour

The iterative nature of DSR introduces a distinct form of methodological rigour. Rather than seeking closure through a single test, design-oriented inquiry prioritises learning through iterative refinement. This is particularly relevant to AI-augmented HRM, where systems evolve through retraining, user adaptation, and shifting organisational priorities (Peffers et al., 2007).

Each design-evaluation cycle can yield incremental insight into how specific configurations of artefacts and governance arrangements shape human-AI interaction. Through this process, DSR enables HRM researchers to remain analytically close to practice while preserving theoretical coherence.

Implications for HRM Research and Practice

The proposed architecture has implications for both HRM research and organisational practice. For HRM scholars, it broadens the methodological repertoire for studying AI-enabled work environments. Instead of treating AI as a static contextual factor, the framework supports theory-informed design inquiry, where complementarity, discretion, accountability, and learning are operationalised through design requirements and evaluation criteria.

This repositioning also reshapes the role of empirical methods. Surveys, interviews, experiments, audit data, and performance metrics retain their value, but they are embedded within design cycles that inform artefact refinement and governance evaluation. As a result, HRM research can remain empirically rigorous while becoming more responsive to the dynamic nature of AI-enabled organisational systems.

For practitioners, the architecture translates abstract debates about human-AI complementarity into concrete design choices regarding decision rights, oversight routines, feedback channels, and evaluation criteria. It encourages HR professionals and organisational leaders to move beyond efficiency-driven adoption and consider how responsible AI principles can be embedded in organisational governance practices (Papagiannidis et al., 2025).

The framework, therefore, supports a more reflective and responsible approach to AI deployment in HRM. It aligns technological innovation with HRM's normative commitments to development, fairness, and human agency. It also provides a practical basis for assessing whether AI-supported HR processes augment professional capability or merely automate existing routines.

Conclusion and Research Agenda

This paper argues that advancing AI-augmented HRM research requires a methodological shift from retrospective empirical validation to proactive, design-oriented inquiry. Framing human-AI complementarity as a design orientation enables the paper to develop a Design Science architecture to address the socio-technical dynamics of AI in organisational contexts.

The proposed architecture integrates problem framing, artefact design, human governance, and evaluation within an iterative learning process. It shows how HRM researchers can use DSR to connect theory, design, governance, and evaluation within a coherent methodological approach. The resulting contribution is analytical and prescriptive, offering guidance for designing AI-HRM systems that augment rather than displace human capability.

Future research can extend the architecture in several directions. Empirical applications can examine its use across recruitment, performance management, learning and development, and workforce planning. Comparative studies can explore how governance arrangements vary across institutional contexts, while longitudinal design studies can assess how human-AI complementarity evolves as systems are refined and users develop new capabilities.

Overall, the paper invites HRM scholars to engage more deeply with the methodological foundations of AI-HRM research. Design-oriented inquiry offers a pathway for producing knowledge that is rigorous, actionable, and responsive to the realities of AI-enabled organisational life.

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ARTIFICIAL INTELLIGENCE ADOPTION IN TAX ADMINISTRATION AND ITS EFFECT ON TAX COMPLIANCE: EVIDENCE FROM GREECE

Papapostolou, Menelaos[1]; Floros, Georgios[1]; Palaiovrysiotis, Ioannis[1]; Drogalas, Georgios[1]

[1]Department of Business Administration, University of Macedonia, Thessaloniki, Greece

Keywords: Artificial Intelligence (AI), Tax Compliance, Trust, Audit Capacity, Procedural Fairness

Abstract

We explore the framework through which artificial intelligence (AI) adoption in tax administration can be effective in improving taxpayers' compliance, taking into consideration technological, institutional and behavioural factors reflective of the current rapid technological and digital advancements of the Greek tax system. Using PLS-SEM to analyse questionnaire survey data collected from 151 taxpayers within the Greek business and labour environment, we demonstrate that AI integration into tax administrative procedures is effective in fostering tax-compliant behaviour only when supported by an environment of transparency, fairness, trust and legitimate audit capacity. Ultimately, we offer insights to tax administrations, emphasizing the necessity of considering taxpayers' practical and ethical perceptions of AI adoption in order to achieve its desired effect on tax compliance, thereby contributing to the emerging interest in tax compliance literature.

Introduction

In the contemporary context of public administration's digital transformation, recent literature indicates that artificial intelligence (AI) technologies demonstrate a strong potential for tax enforcement effectiveness, which, under certain conditions, can be reflected on tax compliance (Belahouaoui and Attak, 2024). Indeed, AI has been proven particularly effective in various tax-related tasks, such as tax fraud and evasion detection (Belahouaoui and Alm, 2025). This technological shift is also a current development in Greece, where the Independent Authority for Public Revenue (IAPR) has already integrated AI procedures such as automated data cross-checking and risk analysis algorithms in order to combat tax evasion. However, AI integration

into administrative procedures raises issues of social acceptance and legitimacy, since algorithmic decision-making is linked to perceptions of transparency, trust and procedural justice (Wang et al, 2020; Lee et al, 2019), eventually underscoring the need for further research on its effectiveness in enhancing tax compliance.

Our study aims to fill this research gap by investigating how technological interventions in tax administration, in our case AI tools, interact with institutional and behavioural factors, and how this interaction influences tax compliance. In this effort, we develop a conceptual model that incorporates AI adoption, perceived audit capacity, perceived procedural fairness, and trust in tax administration, in order to examine their direct and indirect effects on tax compliance. By implementing partial least squares structural equation modelling (PLS-SEM) on survey data collected from 151 taxpayers in Greece, we eventually address two primary research questions:

RQ1: Can AI adoption in tax administration directly impact tax compliance?

RQ2: Are there specific environmental conditions that must be fulfilled for AI adoption to be effective in enhancing tax compliance?

We find that AI procedures, in order to be effective, should be implemented with enhanced transparency, procedural justice, and sufficient audit capacity, as AI tools alone are not capable of fostering tax ethical behaviour. Ultimately, our study contributes to the ongoing discussion of the interplay between digital tax enforcement and actual tax compliance, providing empirical evidence from Greece's ongoing tax system transformation, further strengthening the practical relevancy of our findings.

The rest of this paper is organized as follows: In the next section, we develop our hypotheses. In the third section, we describe our research methodology, while in the following section we demonstrate the results of the statistical analysis. In the final section, we discuss our findings and conclude our study.

Theoretical Background and Hypothesis Development

Tax compliance is related to a number of cognitive and ethical factors, extending from sufficient tax knowledge and consistent bookkeeping, to personality traits such as honesty and ethical behaviour, which in turn result in accurate income and related tax statements, as well as timely tax

payments (Tilahun, 2019; Ademe and Simret, 2020). The main conceptual framework in the tax literature is the "Slippery Slope Framework" (Kirchler et al, 2008), which suggests that tax compliance can be enhanced through either enforced means, such as audits and penalties, which are based on the power of the tax authorities, or taxpayers' voluntary actions, fostered by trust building between them and tax administrations. However, recent literature has highlighted a number of tax compliance determinants beyond this framework, including tax knowledge, task simplicity, perceived fairness and reciprocity, informativeness and digitization (Pukeliene and Kažemekaityte, 2016; Swistak, 2016; Alm, 2019; Pamisetty, 2020; Alm, 2023; Saptono and Khozen, 2023; Usman et al, 2024), ultimately implying the need for further and more timely research.

AI adoption in tax administration

In the context of tax administration, AI can be used to identify anomalies in tax returns, perform predictive analysis for audit targeting, automate VAT reconciliation, and detect patterns of fraud and tax evasion, among others (Shah, 2025). However, as evidenced by the systematic review by Belahouaoui and Attak (2024), while technological advancements such as AI and blockchain are associated with enhanced tax compliance and operational efficiency, there are challenges regarding their adoption (Karam and Ammoury, 2025), primarily in emerging economies. These include, among others, implementation costs, inadequate technical expertise and facilitating conditions, and political constraints (Onyekachi and Ihendinihu, 2025), ultimately highlighting the importance of factors such as appropriate regulatory frameworks, essential skills development, and task simplification, especially for SMEs. Regardless, there is a significant consensus among studies about the potential of AI adoption (AIA) to shape tax compliance, through effects such as improved tax fraud detection (Belahouaoui and Alm, 2025) and tax monitoring systems (Onyekachi and Ihendinihu, 2025), and strengthened tax enforcement (Zaqeeba, 2024), leading us to the following hypothesis:

H1: AI adoption in tax administration (AIA) has a positive effect on tax compliance (TC).

Perceived audit capability

In our study, we define perceived audit capability (PAC) as the taxpayers' perceptions of the tax administration's effectiveness of non-compliance detection and the consistency in the

implementation of tax enforcement measures. It is strongly aligned with related concepts in the tax compliance literature, specifically perceived audit probability (Slemrod, 2019), tax authorities' enforcement power as outlined in the Slippery Slope Framework (Kirchler et al, 2008), tax audit aggressiveness (Blaufus et al, 2023), and taxpayers perceptions of enforcement efficiency and preceding audit experiences (Kasper and Alm, 2022; Hebous et al, 2023). Since tax behaviour is not only shaped by objective enforcement parameters but also by taxpayers' perceptions and motivational stances (Alm, 2019), audit efficiency is considered to have immediate behavioural consequences primarily through aversion, learning mechanisms, and perceptions' reassessment (Beer et al, 2020), ultimately leading to an increase in tax compliance. Therefore, we hypothesize that:

H2: Perceived audit capability (PAC) has a positive effect on TC.

Perceived procedural fairness

Perceived procedural fairness (PPF) involves the individuals' perceptions of the justice of the procedures through which decisions are made. In this regard, Martin et al. (2022) demonstrate that when a policy decision presents itself as an output of fair procedures, citizens evaluate the outcome as more legitimate, even if it remains unchanged. In the context of tax compliance, procedural fairness has long been established as one of its main determinants (Alm et al., 1993; Murphy and Tyler, 2008), with the significance of its effect also depending on factors such as the power of the authority (Van Dijke et al, 2019; Shim et al, 2024) and precedent experiences of unfair audits (Lancee et al, 2023). Indeed, Shim et al. (2024) suggest that the importance of perceived procedural fairness is more pronounced in contexts of low authority power, implying its supportive potential on tax fraud prevention. Taking into consideration the consistent evidence of the effect of perceived procedural fairness, we hypothesize that:

H3: Perceived procedural fairness (PPF) has a positive effect on TC.

Trust in tax administration

The Slippery Slope Framework distinguishes trust in tax administration (TTA) from the authority's power by mainly aligning it with voluntary tax compliance (Kogler et al, 2023). In the present study, we agree with the definition of trust in the tax administration as the taxpayers' belief that the actions of the tax authorities are fair and reliable (Ayoola et al, 2023). From a regulatory

perspective, trust can also be viewed as a concept involving reciprocity and fair contribution (Gribnau, 2017), while it is closely associated with greater decisions' acceptance and compliance (Lind and Arndt, 2016). Besides the effect of trust in tax administration on tax compliance, there is evidence in the literature of the effects of AI adoption (e.g. Aoki, 2020; Wang et al, 2024) and perceptions of audit capacity (e.g. Gangl et al, 2020) and procedural fairness (e.g. Kogler et al, 2015; Gobena and van Dijke, 2016; Rachmawan et al, 2020) on trust, also highlighting the need to examine its potential mediating role between these factors and tax compliance. Therefore, we proceed with the following hypotheses:

H4: AIA has a positive effect on trust in tax administration (TTA).

H5: PAC has a positive effect on TTA.

H6: PPF has a positive effect on TTA.

H7: TTA has a positive effect on TC.

H8a: TTA positively mediates the effect of AIA on TC.

H8b: TTA positively mediates the effect of PAC on TC.

H8c: TTA positively mediates the effect of PPF on TC.

Our formulated model is illustrated as shown in Figure 1 below. Next, we provide a brief overview of the applied research methodology.

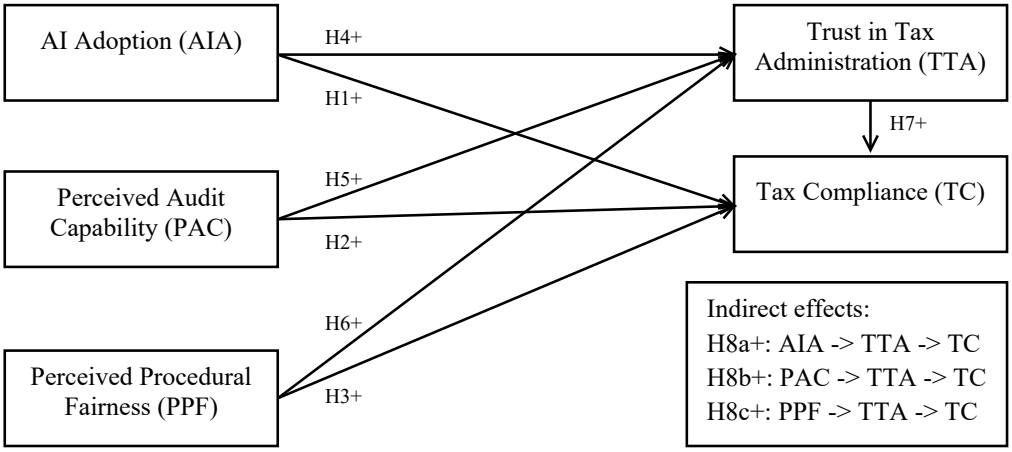


Figure 1: Proposed model

Methodology

As our research instrument, we designed a questionnaire consisting of 31 questions, of which the first 6 captured demographic information, as demonstrated in Table 1 below, and the remaining 25 applied to the five theoretical constructs of our analysis. Eventually, the responses of 151 taxpayers were collected between October 30, 2025 and December 10, 2025, and analysed using partial least squares structural equation modelling (PLS-SEM) to assess both direct and indirect effects of each latent variable. We strongly believe that PLS-SEM is suitable for our analysis, as it allows for the simultaneous estimation of both the measurement model and the structural model (Hair et al, 2019) and our conceptual model consists of constructs with many indicators (Hair et al, 2011).

Variable	Item	n	Percentage
Gender	Male	81	53.60%
	Female	70	46.40%
Age	18-24	16	10.60%
	25-34	66	43.70%
	35-44	35	23.20%
	45-54	27	17.90%
	55<	7	4.60%
Education	High school graduate	4	2.60%
	Technical school graduate	14	9.30%
	Bachelor's graduate	98	64.90%
	Master's graduate	35	23.20%
Experience	< 5 years	67	44.40%
	5-10 years	31	20.50%
	11-20 years	20	13.20%
	Over 20 years	33	21.90%
Taxpayer status	Employee	98	64.90%
	Self-employed/Freelancer	9	6.00%
	Accountant/Tax expert	22	14.60%
	Other	22	14.60%
Last three year audit	No	118	78.10%
	Yes	33	21.90%

Table 1: Sample demographics

Results

We started our statistical analysis with the assessment of the measurement model by conducting factor loading, with values above 0.707 considered ideal (Cheung et al, 2024). Only four indicators (AIA6, PPF3, TC2 and TC3) had values below 0.707, although they were ultimately retained in the model, as loadings between 0.400 and 0.707 can be considered acceptable when reliability and validity indices remain in satisfactory levels (Hair et al, 2011). Indeed, in our study, Cronbach's

alpha, composite reliability (CR) and average variance extracted (AVE) demonstrated values above 0.700, 0.708 and 0.500 respectively, indicating that our model is free of reliability issues, and that convergent validity is established (Hair et al, 2019).

Concerning the discriminant validity of our model, we employed the Fornell-Larcker criterion and the Heterotrait-monotrait ratio (HTMT) method, both of which generated satisfactory results. Specifically, the square root of the AVE of each latent variable is greater than any other correlation with another variable, and no HTMT value exceeds the value of 0.900 (Henseler et al, 2015). Finally, we applied the Variance Inflation Factor (VIF) method to assess the presence of multicollinearity issues. The VIF values in our model are in every case below 3.3, which means that there is no multicollinearity (Hair et al, 2019). An overview of the measurement model is demonstrated in Table 2.

Proceeding with the analysis of the structural model, we first assessed the explanatory power of our model. Chin (1998) suggests evaluating R^2 values as follows: >0.67 (substantial), >0.33 (moderate), >0.19 (weak), <0.19 (very weak). The explanatory power of our model in terms of TC and TTA indicates moderate to substantial explanatory power (63.6% and 69.1%, respectively). Finally, we conducted hypothesis testing with the level of significance set at 5% ($p < 0.05$), using the bootstrap procedure with 5,000 resamples to evaluate the effectiveness of the structural model. The path coefficients and significance levels are presented in Table 3, and discussed in the next section.

Discussion and Conclusions

According to our results, regarding the direct effects on TC, H2 and H3 are accepted, demonstrating statistically significant results and being in line with similar prior studies (e.g. Kasper and Alm, 2022; Hebous et al, 2023). PPF is highlighted as the strongest determinant of TC, further confirming the established position in the tax literature of procedural fairness as a critical condition for higher tax compliance (Kogler et al, 2015; Gobena and van Dijke, 2016). On the other side, H7 is rejected, with TTA showing a positive but non-significant effect on TC, contrary to the findings of previous literature (Gobena and van Dijke, 2016; Batrancea et al, 2022), and even studies taking place in the Greek context (e.g., Fotiadis and Chatzoglou, 2021). We

Panel A: Descriptive statistics, factor loadings and construct reliability and validity					
	Item	Loading factors	Cronbach's alpha	CR	AVE
AI Adoption	AIA1 AIA2 AIA3 AIA4 AIA5 AIA6	0.914 0.879 0.800 0.874 0.795 0.683	0.908	0.928	0.685
Perceived Audit Capability	PAC1 PAC2 PAC3 PAC4 PAC5	0.896 0.864 0.909 0.879 0.902	0.935	0.950	0.793
Perceived Procedural Fairness	PPF1 PPF2 PPF3 PPF4 PPF5	0.892 0.758 0.536 0.914 0.901	0.873	0.904	0.661
Trust in Tax Administration	TTA1 TTA2 TTA3 TTA4 TTA5	0.910 0.962 0.945 0.949 0.956	0.970	0.976	0.892
Tax Compliance	TC1 TC2 TC3 TC4	0.972 0.692 0.572 0.958	0.839	0.885	0.667

Panel B: Discriminant validity findings (Fornell-Larcker criterion).					
	AIA	PAC	PPF	TC	TTA
AIA	0.828				
PAC	0.732	0.890			
PPF	0.666	0.687	0.813		
TC	0.175	0.506	0.650	0.817	
TTA	0.732	0.710	0.768	0.473	0.945

Panel C: Discriminant validity findings (HTMT - Matrix).					
	AIA	PAC	PPF	TC	TTA
AIA					
PAC	0.809				
PPF	0.750	0.711			
TC	0.369	0.542	0.642		
TTA	0.741	0.728	0.775	0.482	

Panel D: Multicollinearity test with the VIF method (Inner model - Matrix).					
	AIA	PAC	PPF	TC	TTA
AIA				2.717	2.419
PAC				2.664	2.549
PPF				2.738	2.123
TC					
TTA				3.236	

Table 2: Measurement model overview

Hypothesis	Coefficient	P value	Supported
H1: AIA → TC	-0.738	0.000	No
H2: PAC → TC	0.452	0.000	Yes
H3: PPF → TC	0.731	0.000	Yes
H4: AIA → TTA	0.303	0.000	Yes
H5: PAC → TTA	0.189	0.001	Yes
H6: PPF → TTA	0.436	0.000	Yes
H7: TTA → TC	0.131	0.057	No
H8a: AIA → TTA → TC	0.040	0.056	No
H8b: PAC → TTA → TC	0.025	0.154	No
H8c: PPF → TTA → TC	0.057	0.075	No

Table 3: Hypothesis testing results

attribute this lack of statistical significance to the concurrent inclusion of other factors in our study, which eventually weaken the significance of TTA's direct effect. Rather interesting is the rejection of H1, where AIA demonstrates a statistically significant but negative effect on TC, in contrast to prior research (Belahouaoui and Attak, 2024; Zaqeeba, 2024). In our case, AIA is seemingly perceived more as a channel for audit intensification rather than as a service improvement, which, consistent with the Slippery Slope Framework, implies that the perceived power of the tax enforcement alone does not contribute to voluntary tax compliance if its not accompanied by trust and legitimacy (Kogler et al, 2015; Gangl et al, 2020).

Moreover, all hypotheses regarding the direct effects on TTA (H4, H5 and H6) are accepted. Similar to the case of TC, PPF is the strongest influencing factor of TTA, showcasing the importance of fair and transparent procedures in developing a tax environment characterized by trust and justice (Kogler et al, 2015; Gobena and van Dijke, 2016). This need is even more pronounced in contexts of AI-infused processes, as evidenced in previous literature (Decuypere and van de Vijver, 2025) and empirically confirmed by the effect of AIA on TTA. Furthermore, the positive impact of PAC on TTA implies that audit capability is not perceived as a suppressive measure, but more as indicative of administrative efficiency and of legitimate law enforcement (Gangl et al, 2020). Finally, none of the hypotheses regarding the indirect effects (H8a, H8b and H8c) are supported, in contrast with prior studies that supported the mediating role of TTA on TC (Kogler et al, 2015; Rachmawan et al, 2020), with the lack of statistical significance possibly reflecting sample size issues and contextual factors, such as the recorded crisis-induced weakening of trust in the Greek tax administration (Kaplanoglou and Rapanos, 2015; Kaplanoglou et al, 2016; Lois et al, 2019).

In conclusion, in the present study we explore how AI adoption by the tax administration can be infused into a conceptual model of traditional determinants of tax compliance. In this effort, we empirically contribute to the tax administration literature on a contemporary issue that has been scarcely addressed (e.g. Decuypere and van de Vijver, 2025), while also examining all these factors in an integrated manner, whereas previous studies usually analyse these factors individually. Our findings mainly indicate that the adoption of AI by the tax administration should be guided by a framework of enhanced transparency, procedural justice and legitimate audit capacity, in order for the AI-infused procedures to be effective and to act as a co-driver of trust and tax compliance. We argue that this is an especially relevant insight for the Greek tax environment, where the current rapid digitization and procedural automation have given rise to themes such as newly found audit capabilities and their potential impact on perceived fairness and subsequent compliance among taxpayers. Future research could employ larger samples, from various national, institutional and professional contexts, in order to explore the potential heterogeneity between the sub-groups. Finally, as taxpayers' perceptions of AI adoption are likely to evolve as the technology matures, subsequent studies could further explore its implications in more advanced phases of implementation, while also distinguishing and incorporating its various potential uses.

Ethics Declaration

The authors of this study do not retain any personal data from the survey participants. In strict accordance with Articles 17 and 18 of the Code of Ethics and Conduct for Scientific Research of the University of Macedonia, the participants have provided informed consent for their responses, which are used solely within the scope of this study.

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THE INTERNATIONALIZATION OF PLATFORM-BASED GROWTH STRATEGIES

Maria Rosaria Marcone
Department of Management, Marche Polytechnic University, Ancona, Italy

Keywords: Digital Platforms, Digital Supply Chain, Supply Chain internationalization

Abstract

This paper focus on the deployment and use of firm-specific artificial intelligence (AI) systems to support supply chain strategy creation and implementation processes. Conceptual research framework is strongly based on type 4.0 digital technology and the effects that its adoption produces on the characteristics of the strategic supply chain (SC) model, in our case not only of individual firms but of an entire and integrated (SC) or ecosystem. The aim of this research is also the analysis on the conceptual connection evolution between open and unconventional innovation forms and knowledge management (KM) strategies in non-large firms. The aim is also to investigate platformed supply chains (PSCs) defined in this study as multinational supply chains that base their 'supply business models' and international growth strategies on digital platforms. The methodology adopted in this research is based on the study of selected cases among the many under observation. We highlight how lead companies are designers-coordinators (or orchestrators) of new platform-based relationships; on the other hand, the other SC firms involved, and the multiple actors involved (think, for example, of digital technology providers, start-ups) are called upon to take deep transformation framing. This involves reimagining business models and adopting fundamentally new architectures to decouple growth from environmental degradation. This perspective is often driven by the clear inefficiencies of scaling current hardware. This transformation framing is underscored by stark data on the technology's immediate resource burden. Original are the first results which highlight how the digital platforms provide critical external resources for small and medium-sized enterprises.

Introduction

This paper focuses on the design and development of artificial intelligence (AI) systems in strategy creation and implementation processes, with a specific focus on their role in enhancing supply chain attentional control (Laamanen et al., 2025). The focus of our research paper is also on the advent and evolution of innovative processes open to new and unusual ways of innovating and, above all, open to new actors in the innovative context. That is, it seems to emerge in the processes of strategy formulation by non-large firms, an openness to broader and more unconventional forms of innovation that draw on the knowledge management within the firms and the SCs to which they belong. At the same time, this new and complex and shared KM forms a new one that evolves towards exploratory technological paths that materialize in new strategies that always seem experimental. In managerial studies, if innovation share an emphasis on novelty and usefulness, creativity is frequently seen as a first step in the innovative process. This is all the truer today, where there are disruptive innovations and different ways of doing research and innovation, such as startups, innovation communities, and OI (Nijstad et al., 2026).

The deployment and use of firm-specific artificial intelligence (AI) systems to support supply chain strategy creation and to facilitate and continually to improve the implementation processes represent a novel and largely unexplored area in the field of strategic management. Many firms have knowledge of their own capabilities and business environment that is not effectively understood and widely shared within new competitive contests.

The digital platforms appear as specific role of leading supply chains firms supporting collaborations among suppliers and other economic innovative actors and the ecosystem (Hafeez et al., 2025; Teoh et al., 2023; Soluk et al., 2023) both in which they belong and in new foreign ecosystems which develop with the internationalization of the SC: we believe that those with the driving role of leading firms (as innovative economic actors) in the PSCs could be more efficient. PSCs have rapidly become new in the sense that they are establishing themselves as new players in the global economy. Ecosystems are communities of hierarchically independent yet interdependent actors and factors collectively generating particular outputs (Thomas and Autio, 2020; Mulhuijzen and de Jong, 2025). Although developed in other fields, especially biology, it is appreciated in economics and business studies because it is considered a valid approach. Consider digital outcome performances (of suppliers, manufactures, firms and SC), ESG outcome or output, the advent of OI (Adner, 2017; Börner et al., 2023; Stam and Van de Ven, 2021).

From the resource-based theory perspective, there is a growing emphasis on platform research within open innovation as a result of digital firms becoming more involved in the crowds to leverage external resource. Supply chain digital platforms are emerging as new and unusual infrastructures that empower the digital transformation of firms belonging at the various level of supply chain attracting growing innovative actors (startupper, innovation communities, etc.) interest (Pauli et al., 2025; Su et al., 2023).

Regarding the methodology adopted, the research is based on the study of selected cases among the many under observation by my research group. These are firms belonging to supply chains that profoundly innovate the way they do business; these supply chain business models are not consolidated but are constantly evolving both because they are reshaped by digital technologies and because they are open to open innovations (OI) and projected to foreign contexts through original strategies for internationalizing the supply chains themselves. We expand the literature on firm's managerial search and learning by empirically documenting the micro-level learning processes and behaviours enabling the dynamic coupling of need and solution spaces. Finally, we contribute to the open innovation perspective by demonstrating how external knowledge critically shapes emerging technology–supply chain business model re-design.

Regarding the structure of the paper, in a first phase some preliminary systematizations of the international management literature are presented. The research presented in the paper is ongoing research and other future openings are planned. Subsequently, mention is made of the research methodology that has been preferred and chosen until now. Finally, some preliminary results and final reflections are presented as useful cognitive contributions to the international management literature.

Theoretical framework

Digital technologies, including artificial intelligence (AI), have played a significant role in transforming innovation ecosystems by enabling previously unconnected actors to converge and collaborate. Digital platforms have redesign interfirm collaboration forms within innovation ecosystems by significantly lowering the barriers to sharing resources and co-developing innovative and digitalized projects. Supply chain relationships are hybrid governance arrangements in which interdependent firms coordinate and control across organizational boundaries through information exchange, resource alignment, and reciprocal collaboration. The adoption of artificial intelligence (AI) is poised to reconfigure these arrangements by reshaping the information environment (e.g., forecastability and

transparency), lowering coordination costs (e.g., synchronizing quality and deliveries), and altering relational governance (e.g., monitoring and enforcement) (Abbasi et al., 2024).

Conceptual research framework is strongly based on type 4.0 digital technology and the effects that its adoption produces on the characteristics of the business model (BM), in our case not only of individual enterprises but of an entire and integrated supply chain or ecosystem (Benitez et al., 2022; Marcon et al., 2022; Besiroglu et al., 2024). Important changes such as crowdsourcing, open innovation, mass customization, and ecosystem integration are demanded in I4.0 BMs. Recent studies have begun to explore the applicability of traditional internationalization process theories to PSCs. Some of the most applied historically models, such as OLI model, relationships theory, transactional theory, FDI theory, and the born global perspective have provided essential insights into internationalization as a gradual or rapid, incremental or abrupt, and path-dependent process (Monaghan et al., 2020). These theories emphasize experiential learning, internal firm development, increasing resource commitments, and the capabilities of managers and entrepreneurs. However, they were originally formulated in the context of manufacturing and traditional service firms, which typically operate with high asset specificity, face significant liability of foreignness, and are constrained by limited resources (Figure 1).

Accordingly, innovation scholars have suggested different structural approaches by which firms can manage dynamic technology capabilities (DTC) such as open innovation, R&D relationships or networks (Ritala and Stefan, 2021; Jovanovic et al., 2022). Developing this type of structural approach can help managers in established firms mitigate and exploit challenges faced by DTC (Aliasghar et al., 2025). According to Teece (2019), firms have two kinds of capabilities, namely operational capabilities and dynamic capabilities. An operational capability enables firm, and we will also see the modern and digitalized supply chains, to conduct their activities efficiently and effectively daily in the development of products and services. Usually, internationalized firms have access to a lot of operational capabilities. However, operational capability consists of parts referring to firm-specific sets of skills, equipment, facilities, processes, routines, administration, and coordination developed by the firm and used for efficient and effective problem-solving or fulfilling needs. We propose the first question in our research.

RQ. 1 - How KM strategies are openness in non-large firms belonging to digitalized SC.

Several authors have theoretically suggested separating strategic business model innovation and process innovation fields, arguing that new business models can generate value through process innovation or without recourse to process innovation (Markides, 2013; Brunswickera and

Schecter, 2019). Other authors have considerate business model innovation, product and process innovation as different innovation. As well as other studies show that external search (relating to the number to the number of stakeholders with a different technological heritage and how intensively a firm resort to stakeholder innovation) is positively related to all the firm's innovative business processes types (business model, product, process) types (Snihur and Wiklund, 2019). When new technologies are introduced, firms theoretically discontinue investments in old technologies to prioritise investment in the new ones (Gustafsson et al., 2025).

There are no studies that analyse how firms in relation (to each other) to the supply chain participate in the internationalization process initiated by a multinational-guide that acts as a digital platform that guides the companies and more general the Italian economic operators up stream (agronomists, start-ups for the production-supply of digital services and new practices for managing R&D activities, suppliers of materials useful for production processes and the sourcing of services in foreign country markets), of highly connected supply chains, such as those opened by suppliers of ancillary materials, such as packaging and machinery manufacturers). For example, digitalisation drives transformation in firms and in firm's relationships management all over the world and, from a strategic perspective, presents both threats and opportunities and a strong imperative for change (Gomes et al., 2023; Ashare et al. 2024).

By contrast, PSCs research purposes function under a distinct logic. Their international growth is enabled by digital infrastructures of which are basically the promoters and driven by factors such as digital relationship effects, institutional asymmetries, and supply chain platform-specific features (Tajedin et al., 2019; Stalkamp and Schotter, 2021). Moreover, they must manage unique regulatory challenges and integrate into diverse local ecosystems (Meyer et al., 2023), further complicating their expansion. In response to these complexities, some scholars argue for entirely new models to explain the internationalization of digital firms (e.g., Birkinshaw, 2022; Monaghan et al., 2020), while others advocate for adapting and extending existing theories about transaction costs economy (Hennart, 2022). This paper aligns with the latter view. We argue for a process-based but integrative approach that reinterprets conventional theories to better account for the dynamic nature of PSCs (Monaghan et al., 2020).

PSCs are defined in this study as multinational supply chains that base their 'supply business models' and international growth strategies on digital platforms that govern digital interface that enables interactions between distinct user groups - such as manufactures, suppliers, sellers, innovation communities, start-ups and complementors - and creates value by facilitating the

structural offer and the competitive positioning both of the PSCs and of the economic operators and companies that cooperate and participate in the internationalization of the entire supply chain.

One of the most notable features of PSCs is the accelerated pace of their internationalization compared to traditional supply chain (SCs). Sometimes, given the innovativeness of this governance phenomenon for growth they can even be equated at born global innovative supply chains mostly composed of born global firms or new start up: this unconventional internationalization has led scholars to compare innovative SCs with "born global supply chains" (Brouthers et al., 2016; Banalieva and Dhanaraj, 2019; Zaheer et al., 2019; Robertson et al., 2021), often emphasizing the seemingly limited need for physical infrastructure during their international expansion.

The internationalised supply chain growth strategies seem to highlight at least two relevant aspects: (a) they spread rapidly; (b) they involve highly heterogeneous firms and supply chains (in size, location of production activities and research activities, type of sector to which they belong, etc.). From here derive two research questions as below.

RQ 2. The question arises as to whether this speed of implementation can benefit smaller companies than larger ones traditionally suited to explosive international development.

RQ 3. The aim is to investigate some types of heterogeneity and evaluate whether some of these could represent significant gaps for the international growth of both supply chains and the firms that belong to them.

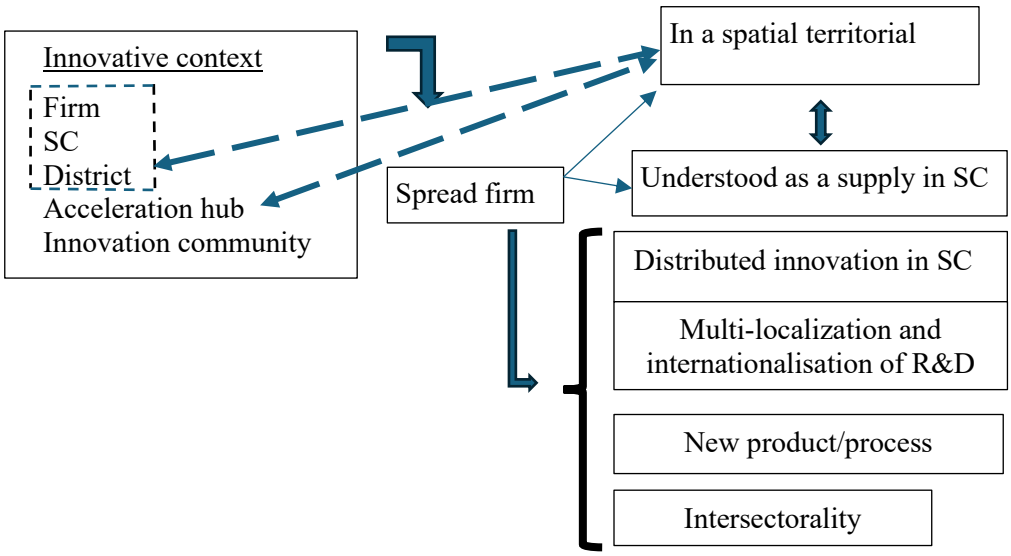


Figure 1 : Theoretical framework

Methodology

Given the scarcity of relevant research in this domain, we have adopted a grounded theory exploratory research design, leveraging in-depth, semi-structured interviews as our primary data collection method (Glaser and Strauss 2017). We used an explorative approach, conducting semi-structured interviews. We initially identified potential participants through industry reports, professional networks, and referrals within the innovation ecosystem community. Data were collected through interviews representing management and other economic and non-economic actors (innovation community, research laboratory, institutional financial operator, institutional policy maker, etc.). Additional data were collected from meetings, webinar, academic teaching, seminar, project work studies in academic classroom, company documents, field notes and observations. Subsequently, the collected data were analysed thematically. To address the research question effectively, we specifically targeted managers and innovative actors from firms embedded in innovation ecosystems that are, we think, Italian digitalized and sustainable SCs.

The main conceptual research framework is based on the adoption of type 4.0 digital technology in leading firms which redraw supply chain relationships within innovative digital supply chains and the effects that its adoption produces on the characteristics of knowledge management development processes and on the redesign of strategic business models, in our case not only of individual enterprises but of an entire and integrated supply chain or ecosystem (see table 1). This research used theoretical sampling for case selection (Eisenhardt and Graebner, 2007) since the objective is to build concepts and theory regarding the mechanisms involved in innovative strategic business models based on knowledge management that opens up to new forms of openness (towards a plurality of technological, economic and non-economic, relevant actors) when I4.0 changing factors are present. Therefore, the main criterion for sample definition was to search for cases representative of I4.0 technology provision regarding key technologies offered with leading representativeness of the technologies and firms analyzed in the manufacturing industry.

In this paper, value-offering ecosystems is useful to map the actors and factors generating value for a specific target audience offering (Mulhuijzen and de Jong, 2025). Examples within this category are business ecosystems (mapping the broader community of a focal firm) and platform ecosystems (focusing on a connectivity interface like a digital platform and the actors generating value on that interface). It is necessary to study a System of Economic Actors, an area not of micro but of meso-level in which firms and technologies are protagonists. As regards

the implications, studies of value-offering ecosystems generally provide recommendations to managers useful is Holgersson (Holgersson et al., 2022).

Ecosystem integration approach, main key lines	- Cooperation and vertical integration among players - Share capabilities and resources for collaborative manufacturing solutions - Enable new customer relationships - Co-designing solutions - Innovative partnerships - Information transparency - Value capturing processes to share knowledge - Ecosystem integration: joint decision-making, crowdsourcing, open innovation

Table 1 : Integration supply chain drivers

Several sources for data collection are available for case study research. With regard to the choice of cases, the following were selected at this stage of the research, from among the many case studies which all represent useful research laboratories (see table 2).

- Agricolture 4.0: sustainability crops; productivity of fields labour force.
- Tech4Fashion Hub (in Emilia Ecosystem).
- B. firm integrated supply chain with digital projects platform for durum wheat and soft wheat
- Internationalization of the Sassuolo tile supply chain in the USA.
- Internationalization of the dairy supply chain in Africa by G. and BF (precision farming).
- L. Project for sustainability: Italian aerospace.
- Ecoystem internationalization: (1) SK start up of Berkeley at MID- Milano; (2) I. (Italian Institutions) which 'brings' Italian start-ups and SMEs to North Beach (S.Francisco).

Table 2 : Case studies

This approach is particularly suited for the explorative nature of this research, where the data collection and the analysis that follows are iterative. Instead of testing a predefined hypothesis, the study aims to generate insights through an open-ended, iterative process for explorative data collection.

An iterative analysis, perhaps better than other approaches, we believe, can be supported by a longitudinal field survey: in fact, the aim of the work is to follow the strategic development of the cases over time (strategic and technological evolution, growth of some parameters that express digitalization and sustainability performance, etc.).

Some preliminary findings

This research that still ongoing demonstrates the need for a dynamic approach to managing the paradox of OI, which involves balancing controlling and sharing of knowledge through various mechanisms or forms for developing and diffusing both tacit and explicit knowledge.

This paper, based on the analysis about conceptual connection between open innovation (OI) and knowledge management (KM) strategies in non-large firms investigate platformed SC that is to say digitalized SC. The PSCs which are those supply that base their 'supply business models' and international growth strategies on digital SC platforms.

Following the results obtained from the analysis of the case studied, especially the deep external search is positively related to the medium sized firm's innovative business process types. Lead firms are designers-coordinators (or orchestrators) of new platform-based relationships; on the other hand, the other SC companies involved and the multiple actors involved (think, for example, of digital technology providers, start-ups, sustainable Institutions) are called upon to take on profound transformative challenges): to realizing real circularity demands systematic change. This involves reimagining business models and adopting fundamentally new architectures to decouple growth from environmental degradation. This perspective is often driven by the clear inefficiencies of scaling current hardware. This transformation framing is underscored by stark data on the technology's immediate resource burden.

Digital platforms provide critical external resources for small and medium-sized enterprises (SMEs) even for those seeking to internationalize (RQ. 2 and RQ.3).

Platforms facilitate recombination, leaving the role of the firm central (it could not be otherwise, as it increases productivity; a new relationship or combination arises between ease and productivity effects. The platform plays an important role if you think that a knowledge complexity trade-off can be identified if and when the complexity of the stock of knowledge engenders positive effects in the recombinant generation of new technological knowledge but negative ones in its exploitation in terms of productivity gains (RQ. 1). On the one hand, the complexity of the stock of knowledge increases the scope for recombination and hence the amount of knowledge that each firm is able to generate with a given budget. On the other, the complexity of the stock of knowledge has controversial effects on productivity: the indirect effects - via the larger amount of knowledge generated upstream- are positive but the direct ones can be negative if they generate difficulties in the exploitation of a highly heterogeneous stock of knowledge.

Digital platforms in digital supply chain enable firms to overcome classical information and coordination practices. Unlike traditional information technology intermediaries (such as brick-and-mortar travel agencies), digital platforms in technological supply chain enable firms to overcome classical information and coordination constraints by combining market mechanisms with elements of hierarchical control in hybrid, firm' governance-designed systems (RQ. 1). These platforms rely on semi-directed and generative search processes, which go beyond centralized mechanisms to enhance innovation and adaptability in fast-changing competitive ecosystems (Tajedin et al., 2019). In addition, platforms provide a low-cost pathway to scale-up manufacturing systems, offering superior capabilities for environmental scanning, opportunity sensing, and the integration of diverse material inputs and managerial skills (RQ. 2 and RQ. 3).

These advantages give PSCs greater agility to complete and to well positioning the internationalized SC in foreign Country-Markets (RQ. 2 and RQ. 3).

Conclusion

Our results showed that the I4.0 technologies and solutions impact the whole supply chain business model system. While the international business literature has moved beyond gradualist views of multinational expansion, existing concepts still leave important gaps. Early research on born-global firms described companies that internationalize from inception, bypassing incremental learning stages. Later, the born-again global concept captured firms that accelerate global expansion after a major strategic shift. However, neither model fully explains the trajectory of many digital platforms, which combine instant global availability with delayed and uneven market penetration.

They spread very quickly; they seem to help firms belonging to SCs not naturally suited to internationalization. Their rise has not only disrupted industries but also challenged conventional understandings of how firms internationalize.

Regarding the relevant heterogeneity, we find that this heterogeneity highlights two critical gaps in the current literature. First, PSCs are not a homogeneous category: their business models, strategic choices, and internationalization trajectories vary significantly. Second, most traditional theories of internationalization, developed in the context of manufacturing or conventional service firms, struggle to account for the specificities of digital, platform-based international expansion. As a result, there is a pressing need to revise or extend these

frameworks to capture better the distinct dynamics of PSCs (Kang et al., 2025; Li et al., 2025). In light of this theoretical gap, this study investigates the internationalization of PSCs.

We find that suppliers can leverage global value SCs to enhance innovation impact and capture value (Qin and Li Sun, 2026). We agree that innovative ecosystems are the interconnected system of economic actors, institutions, and resources that collectively contribute to the creation, diffusion, and adoption of new ideas, products, and processes (Adner and Kapoor 2016). These actors include firms, universities, research institutes, governments, investors, and customers. The concept of an innovation ecosystem highlights the fact that innovation is a collective process, and no single actor can create innovation on its own (Adner and Kapoor, 2016; Sjödin et al., 2023). We can affirm that the successful adoption of AI technology in innovative ecosystems such as platformed SC depends on a range of factors, including technical considerations, managerial practices, managerial ethical attitudes.

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AI Adoption Dynamics in Greece: A Markov Chain Analysis and Implications for Algorithmic Leadership

Tsagkanou Maria[1], Rapti Andriana[2], Polychroniou Panagiotis[3]

[1,2,3,] *Department of Business Administration, University of Patras, Patras, Greece*

Keywords: Artificial Intelligence; Algorithmic Leadership; Innovation; Productivity; Markov Chain; Greece.

Introduction

Artificial Intelligence (AI) is becoming an important component of organizational activity, influencing managerial decision-making and strategic planning. As its use expands beyond routine automation, managers are increasingly required to interpret and apply technology-generated insights in organizational decisions. This has increased interest in algorithmic leadership, which focuses on how managerial judgement interacts with algorithmic recommendations (Aziz et al., 2024; Bevilacqua et al., 2025). Despite the growing diffusion of AI across Europe, adoption in Greece remains comparatively low (Eurostat, 2025).

Purpose, Aim and Objectives

Although research on AI adoption has expanded, most studies examine adoption at a specific point in time. Less attention has been given to how adoption changes over time and how it evolves across different economic activities. Our study examines AI adoption patterns in Greece between 2018 and 2025 and explores their relationship with productivity and innovation outcomes. Drawing on the dynamic capabilities perspective, it also considers the implications of these developments for managerial capabilities associated with algorithmic leadership.

Literature Review and Theoretical Framework

Previous research links AI adoption with higher efficiency, innovation, and better performance outcomes (Chen et al., 2023; Wamba et al., 2024). These outcomes are not assured, as organizations differ in how effectively they integrate and utilize new technologies. Recent studies on algorithmic leadership also highlight the need to combine data-driven insights with managerial judgement in decision-making (Bevilacqua et al., 2025; Madanchian et al., 2024). Even though AI adoption has been widely examined, less is known about how it changes over time, especially in Greece.

Methodology and Methods

In this study, we use data from 2018–2025 on AI adoption, productivity, and innovation across Greek economic activities. We classify adoption into low, medium, and high states and apply Markov chain analysis to examine transitions over time. We further use panel regression to explore links between adoption, productivity, and innovation. Given the aggregate nature of the data, our analysis focuses on sector-level trends rather than individual firms.

Main Findings and Contribution

Our findings show a gradual shift from low to medium adoption, while transitions to high adoption remain slower. Consistent with previous research (Chen et al., 2023; Wamba et al., 2024), we found that higher adoption levels are also associated with stronger productivity and innovation outcomes. By focusing on transitions rather than static levels, we offer a more dynamic view of technological diffusion in Greece.

Originality and Value

We contribute in three ways. First, we provide evidence on AI adoption dynamics in Greece. Second, we use Markov chain modelling to examine adoption transitions over time. Third, we discuss how these dynamics relate to algorithmic leadership and emerging managerial capabilities.

Research Limitations

The study is not without limitations. Because the analysis relies on aggregate indicators, it cannot capture differences across individual firms. In addition, the Greek context may limit the broader applicability of the findings. Future research could build on firm-level data and direct measures of leadership practices.

Theoretical and Practical Implications

Our findings suggest that AI adoption alone is not enough. What really matters is how well organizations use these tools in daily work and decisions. For managers, this means stronger digital skills and better leadership. For policymakers, it points to investing in skills, innovation, and the conditions that make adoption easier.

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ANTHROPOMORPHIC AI, TRUST FORMATION, AND SUSTAINABLE PURCHASING BEHAVIOUR AMONG GENERATION Z CONSUMERS

Gilinjov, Rauf[1]; Papasolomou, Ioanna[2]; Porcu, Lucia[3]; Dionysiou, Ioanna[4]

[1]Department of Management, School of Business, University of Nicosia, Nicosia, Cyprus

[2]Department of Management, University of Nicosia, Nicosia, Cyprus

[3]Department of Marketing and Market Research, University of Granada, Granada, Spain

[4]Department of Computer Science, University of Nicosia, Nicosia, Cyprus

Keywords: Anthropomorphic AI, Consumer Trust, Sustainable Consumption, Generation Z, Slow Fashion, AI-Mediated Retail, Purchase Intention, Systematic Literature Review.

Introduction

The fashion industry remains associated with environmental pressure, while sustainable fashion consumption is constrained by the value-behaviour gap: consumers may express positive sustainability attitudes but not consistently translate them into purchasing behaviour (Wiederhold and Martinez, 2018). This is especially relevant for Generation Z, whose consumption is shaped by sustainability awareness, digital retail exposure and fast-fashion accessibility. At the same time, AI-driven retail systems, including chatbots, conversational agents and recommendation interfaces, increasingly mediate how consumers search for, evaluate and interpret fashion products.

Purpose, Aim and Objectives

This study examines how anthropomorphic AI influences trust formation and sustainable purchasing behaviour among Generation Z consumers in sustainable and slow-fashion contexts. The research question is: how do anthropomorphic AI features influence trust formation and sustainable purchasing behaviour among Generation Z consumers in AI-mediated fashion retail contexts? The objectives are to identify key anthropomorphic AI features, examine trust-related mechanisms, assess their relevance to sustainable fashion decision-making and develop a conceptual framework for future empirical investigation.

Literature Review and Theoretical Framework

The study builds on anthropomorphism theory and social responses to technology. Users may respond socially to technological agents when they display human-like cues (Nass and Moon,

2000). Anthropomorphism, understood as attributing human characteristics to non-human agents, helps explain how AI cues such as human-like language, responsiveness and emotional tone shape perceptions of social presence, warmth, competence and credibility (Epley et al., 2007). In sustainable fashion, decision-making is also influenced by price, aesthetics, authenticity, identity, social influence and perceived behavioural control. Therefore, the study integrates anthropomorphic AI, trust formation and sustainable consumption literature.

Methodology and Methods

The study adopts a systematic literature review approach informed by PRISMA principles, which support transparent identification, screening and reporting of literature-based evidence (Pahlevan-Sharif et al., 2019). Searches were conducted across Scopus, EBSCO and ProQuest using terms related to anthropomorphic AI, trust, consumer behaviour, sustainable fashion, slow fashion and Generation Z. The initial search identified 606 records. After duplicate removal, title and abstract screening, and full-text eligibility assessment using predefined inclusion and exclusion criteria, 103 studies were retained for the broader review. The final synthesis focuses on studies directly relevant to anthropomorphic AI, trust formation and sustainable fashion decision-making.

Expected Findings, Contribution and Implications

The review is expected to show that anthropomorphic AI affects sustainable consumer decision-making indirectly rather than through a simple linear effect. Human-like AI cues may strengthen trust by increasing perceived social presence, credibility, warmth and interaction quality. However, these effects are likely to depend on perceived authenticity, transparency of AI use, consumer scepticism and the credibility of sustainability claims. The study contributes theoretically by distinguishing trust in AI systems from trust in fashion brands and by explaining how trust may transfer between AI-mediated interfaces and brand evaluations. Practically, it offers guidance for designing AI-based retail communication that supports credible sustainable fashion choices.

Originality and Value

The originality of this study lies in connecting anthropomorphic AI, trust formation and Generation Z sustainable fashion consumption within one conceptual framework. While prior studies often examine AI adoption, chatbot use or sustainable consumption separately, this study addresses their intersection in slow-fashion decision-making.

Research Limitations

As a systematic literature review, the study is limited by the scope, availability and quality of existing research. Since studies combining anthropomorphic AI, Generation Z and slow fashion remain limited, future research should test the framework empirically.

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THE CONTENT OF SUSTAINABILITY DISCLOSURE IN THE RISK–RETURN PERSPECTIVE

Trequattrini, Raffaele[1]; Russo, Giuseppe[1]; Cuozzo, Benedetta[1]; Schimperna, Maria[2]; Palumbo, Emanuela[1]

[1] Department of Economics and Law, University of Cassino and Southern Lazio, Italy

[2] Faculty of Economics, La Sapienza University of Rome, Italy

Keywords: risk-return, sustainability, disclosure, ESG, signalling theory, lenders, investors, Italy

Abstract

Our aim was to assess how companies that provide more information in qualitative and quantitative terms on sustainability are perceived in terms of risk, analysing the perspective of lenders and investors, adopting the signalling theory. To achieve our research aims, we applied a qualitative-quantitative methodology. Specifically, after a sample selection, in the first step, we adopted a qualitative methodology through a content analysis approach to investigate the quality and quantity of information disclosed and to assign a score to each company. Finally, we realized a correlation analysis. The results revealed a differentiated picture across ESG pillars and score types. The positive association between environmental disclosure and profitability indicators (ROE) suggests that companies with genuine environmental commitments show better financial performance, consistently with a separating equilibrium. The normalised social and governance scores show a negative association with the cost of equity, suggesting that more balanced disclosure reduces information asymmetries with investors and lenders. This evidence is relevant from both a theoretical and practical perspective. From a theoretical perspective, it fills a gap in literature and advances research on the effect of sustainability disclosure on corporate risk and company valuation. From a practical perspective, it supports managers in understanding how adequate sustainability disclosure that goes beyond mere legislative requirements can be a tool for attracting investment.

Introduction

Sustainability has become a crucial and complex issue for companies, considering ongoing changes to European directives (Directive 2014/95/EU; Directive 2022/2464/EU) and the

numerous fragmented standards that have emerged in recent years, e.g., Global Reporting Initiative (GRI) Standards, *Gruppo di studio per il bilancio sociale* (GBS), Sustainability Accounting Standards Board standards (SASB), Task Force on Climate-related Financial Disclosures (TCFD). This fragmentation, in some cases, has also led to greenwashing and cherry-picking (Gallego-Álvarez et al., 2018; Heras-Saizarbitoria et al., 2022; Macpherson and Rimmel, 2025). In this perspective, there is a growing interest in the academic research on the topic (Hamrouni et al., 2020; Eliwa et al., 2021; Raimo et al., 2021; Arora and Sharma, 2022; Tarulli et al., 2023) and discordant results on a possible translation of benchmark sustainability disclosure practices into better access to credit and risk capital (Trequattrini et al., 2025). An empirical study was conducted, focusing on several indicators, yielding statistically significant results.

Thus, a literature gap emerges about how the content of sustainability disclosure may influence access to capital considering signalling theory, i.e., the reduction of information asymmetries. Particularly, the increased disclosure might reduce informational asymmetries in markets with elements of uncertainty (Lacchini and Trequattrini, 2024). In the light of this, the research work focuses on the relationship between credit and risk capital and sustainability disclosure.

Our article aims to assess how companies that provide more information in qualitative and quantitative terms on sustainability are perceived in terms of risk, analysing the perspective of lenders and investors and interpreting this with the signalling theory.

We applied a qualitative-quantitative method based on content and correlation analysis (Hair et al., 2003; Krippendorff, 2013). The content analysis aims to assign a score to the quantity and quality of sustainability disclosure. The correlation analysis aims to understand if, as quality and quantity increase, investors' and lenders' perception of business risks also improves, thereby improving access to credit and risk capital.

This paper addresses several calls, including the 19th Annual EuroMed Academy Conference, and has several theoretical and practical implications. From the first perspective, it fills a gap in the literature and advances research on the effect of sustainability disclosure on corporate risk and company valuation (Lacchini and Trequattrini, 2024; Lacchini et al., 2025; Trequattrini et al., 2025). From the second perspective, it is helpful for managers to understand how a good sustainability disclosure can be a tool for attracting investment.

The article's structure is as follows. After this introduction, we realized a literature review. Then, we underlined the method. Subsequently, we presented the results and their discussion and conclusions.

Literature Review

The recent studies on sustainability and its relation with the risk capital

Due to an increased interest in the sustainability indicators and disclosure, and a relevant continues changes in directive, the number of related publications indexed on Scopus is constantly growing (Loizzo and Schimperna, 2022; Fatima and Elbanna, 2023). Fatima and Elbanna (2023) carried out a systematic review of 122 empirical studies to provide a status quo of the literature on CSR implementation. Some authors provide a set of instrumental indices that capture the status and evolution of national Environmental Social and Governance (ESG) performance (Jiang et al. 2024) and claimed that there is a "club convergence" in ESG performance across countries. Some others assessed the impact that the ESG disclosure has on sustainability (Passador, 2023), focusing on the role of the risk committees, the sustainability-linked committees and the chief sustainability officer, providing insights into the companies that reshape their governance structure and make it more streamlined, according to the ESG evolution. The literature review shows discordant results on the topic. The literature indicates a negative correlation between sustainability disclosure and the cost of credit (Arora and Sharma, 2022; Tarulli et al., 2023). Another part of the literature claims that the increased disclosure should reduce risk perception by reducing informative asymmetries that characterise markets with elements of uncertainty (Lacchini and Trequattrini, 2024), as ESG disclosure provides a significant value of the firm on the market, getting the ESG proposition right links to higher value creation (Aydoğmuş et al., 2022). Paying attention to ESG concerns does not compromise returns, rather the opposite (Henisz et al., 2019). ESG links to cash flow in five important ways: facilitating top-line growth, reducing costs, minimising regulatory and legal interventions, increasing employee productivity, and optimising investment and capital expenditures. Also, Hamrouni et al. (2020) demonstrated that environmental disclosure has a negative correlation, while social disclosure has a positive correlation. On the other hand, the ESG factors combined score has a positive and significant relationship with firm profitability. While it has been stated that environmentally and socially aware organisations can attract finance at a lower cost (Goss and Roberts, 2011). Other studies also show a negative correlation between ESG disclosure and the cost of credit. Specifically, Jeon and Kim (2015) focused on corporate governance, finding that large-sized firms with dedicated investor relations exhibit a significant negative correlation with the cost of credit. If an increase in disclosure reduces the cost of capital by reducing information asymmetries (Talbi and Omri, 2014; Dunne and McBrayer, 2019; Arora and Sharma, 2022; Tarulli et al., 2023), some empirical studies

(Hamrouni et al. 2020) verified the impact of non-financial reports on the cost of credit showing that the overall CSR disclosure score has a negative correlation with the cost of credit, while only the social disclosure is positively associated. According to Raimo et al. (2021) companies that are more transparent about ESG information have better financial resources and conditions. It is interesting to note the reflection that, according to He et al. (2019), mandatory disclosure does not affect the relationship between voluntary information and the cost of capital, whereas event-driven disclosure does. Consequently, existing research yields conflicting evidence, particularly concerning the relationship between sustainability reporting and the cost of equity. Furthermore, a recent bibliometric analysis by Trequattrini et al. (2025) highlighted that, as of December 10, 2024, the Scopus database contained a mere 107 papers on this subject within the business, management, and accounting domain, but only three publications explicitly address the nexus between risk and ESG disclosure.

The signalling theory

Signalling theory is helpful in describing behaviour when two parties (individuals or organisations) have access to different information. Typically, one party, the sender, must choose whether and how to communicate (or signal) that information, and the other party, the receiver, must choose how to interpret the signal (Connelly et al., 2011). Accordingly, signalling theory holds a prominent position in a variety of management literatures, including strategic management, entrepreneurship, and human resource management. While the use of signalling theory has gained momentum in recent years, its central tenets have become blurred as it has been applied to organisational concerns. The main issue is that actors within organisations must commonly make choices with incomplete and asymmetrically distributed information (Bergh et al., 2014). Signalling theory seeks to explain how individuals do so. This theory's primary predictive mechanism is 'separating equilibrium', which occurs when a signal's expectations are confirmed through experience. Incorporating a separating equilibrium can generate novel insights. Elsewhere, the signalling theory can be integrated with other information perspectives, in which a signal becomes one stimulus that corporate actors interpret and act upon. Having observed that the signalling theory is well acknowledged, especially in some of the management research areas - corporate governance or mergers and acquisitions, for instance- von Deimling et al. (2022) provided the general conditions for application. They underlined that, while the signalling and receiving entities that exchange signals are often at the heart of signalling-related inquiries, other important features, such as opportunity sets, signalling costs, signal confirmation, feedback loops, and the signalling environment, seem to be neglected.

An empirical analysis of signalling theory has been developed by Burze et al. (2020), supporting an extension of signalling theory to account for information asymmetry. They explored immediate reactions to signals, using nearly 20 years of data for the test, and found that receivers do react to positive signals from a credible insider signaller to obviate information asymmetry. In line with previous research, the study also finds that receivers react much strongly to negative signals. Thus, considering the partial and conflicting studies, a literature gap remains about how the content of sustainability disclosure may influence access to capital in light of signalling theory, i.e., the reduction of information asymmetries.

In this perspetive, our research question (RQ) is:

RQ: "How does sustainability disclosure content influence access to equity and credit capital?"

Method

To achieve our research aims, we applied a qualitative-quantitative methodology (Blumberg et al., 2014). Following Hair et al. (2003), combining qualitative and quantitative methods strengthens research design, as each approach plays a distinct role and their integration yields more robust results than either alone. Specifically, after a sample selection, we adopted a qualitative methodology using a content analysis approach (Krippendorff, 2013) to investigate the quality and quantity of information disclosed and to assign a score to each company. Thus, we codified and quantified sustainable disclosure across a set of non-financial reports using categories derived from the Communication from the Commission (2019) and literature. In the second step, we realised a quantitative methodology through a correlation analysis between i) the score and a ratio expression of cost of equity and ii) the score and cost of debt. However, a correlation with the main performance indicators was carried out to ensure results' validity.

Sample selection

To understand the effect of the quantity and quality of sustainability disclosure on the cost of capital. The sample consists of 20 Italian companies operating in the fashion and apparel sector (NACE Rev. 2 code 14). The selection followed a systematic three-stage procedure: (i) extraction from the AIDA database of companies with available financial statements and profitability indicators for F.Y. 2024; (ii) verification of the publication of a sustainability report (DNF, integrated report, or equivalent) on the company's official website for the same reference year; (iii) random extraction of the final 20-unit sample from the eligible companies meeting both criteria. The focus on a single sector ensures sectoral homogeneity, controlling for the industry-level heterogeneity that typically confounds multi-sector ESG studies. Moreover, Italy

is an appropriate context, as the NFRD and CSRD are European directives, and Italy can be considered a synthesis of European characteristics, with urbanised and rural areas and a diversified economy that covers a variety of sectors, such as agriculture, industry, and services. Random selection is intended to avoid any influence from decision-making mechanisms on human involvement. The 20 companies are mainly concentrated in Northern Italy (16 out of 20); the remaining 4 are located in Central Italy and in Southern Italy. This distribution does not constitute a sampling bias, but rather reflects the actual geographical structure of the sector. The presence, albeit a minority, of firms in Central and Southern Italy ensures, at the same time, sufficient geographical heterogeneity to rule out the possibility that the results are systematically influenced by homogeneous territorial factors, thereby strengthening the robustness of the analysis.

Data collection and analysis

The keyword clusters for the content analysis were developed based on the ESG factors adopted by Borsa Italiana for the composition of the MIB ESG Index (Moody's V.E / Vigeo Eiris methodology). For each factor, a specific set of Italian terms was created and searched within the Italian versions of the corporate reports. Keyword clusters were constructed for each ESG pillar following the factor structure adopted by Borsa Italiana for the MIB ESG Index (Moody's V.E methodology). Six factors were covered for the Environmental dimension, eight for the Social dimension, and six for the Governance dimension. For each factor, a set of Italian-language keyword variants (Table 1) was developed to account for terminological diversity across reports (e.g., for Supply Chain Management: gestione della catena di fornitura, gestione della catena di approvvigionamento). The frequency of each keyword cluster was counted in the Italian version of each company's sustainability report, yielding a raw score per pillar (E, S, G) and a total ESG score. A normalised score was also computed for each pillar as the percentage of the pillar's raw score over the total ESG word count, to control for the effect of report length on absolute frequency counts.

Pillar E		Pillar S		Pillar G	
Borsa Italiana Keywords	Cluster	Borsa Italiana Keywords	Cluster	Borsa Italiana Keywords	Cluster
Climate Change Strategy	Cambiamento climatico, strategia climatica	Equal Opportunities	Pari opportunità, parità di genere, diversità e inclusione	Business Ethics	Etica aziendale, etica del business, codice etico
Eco-Efficiency	Eco-efficienza, efficienza operativa	Freedom of Association	Libertà di associazione, contrattazione collettiva,	Compliance	Conformità

			contratto/i collettivo/i		
Energy Management	Energia, gestione energetica, gestione dell'energia	Health and Safety	Salute e sicurezza	Independence of the Board	Indipendenza del consiglio, amministratori indipendenti, indipendenza di giudizio
Environmental Impact of Product Portfolio	Sostenibilità del/dei prodotto/i, ciclo di vita, Life Cycle Assessment (LCA), prodotto/i sostenibile/i	Human Rights	Diritti umani, diritti dell'uomo	Voting Rights	Diritto di voto
Environmental Management	Gestione ambientale	Product Responsibility	Responsabilità del prodotto, etichettatura, sicurezza dei consumatori	Shareholder Participation	Partecipazione degli azionisti, engagement degli investitori
Water Risk and Impact	Rischio idrico, stress idrico, consumo idrico, consumo di acqua	Social Impact of Product Portfolio	Impatto sociale dei prodotti	Remuneration	Remunerazione
		Supply Chain Management	Gestione della catena di fornitura, gestione della catena di approvvigionamento		
		Taxes	Tasse		

Table 1: Pillar E, S,G, cluster - *The clusters based on Italian keywords, the corporate reports were analyzed in their official Italian versions to ensure consistency with the defined keyword clusters.*

We collected information on sustainability disclosures from the company's website for the last Fiscal Year (F.Y.). We measured sustainability disclosure through keyword frequency analysis. For each cluster, we counted the total occurrences within the Italian version of each company's sustainability report, yielding a raw score per pillar (E, S, G) and a total ESG score. A normalised score was also computed for each pillar as the ratio of the pillar's raw score to the total ESG word count, to control for report length bias.

After, we exported economic-financial information through the AIDA database. Specifically, according to literature (Lacchini et al., 2025; Trequattrini et al., 2025), we used four ratios:

i.) Credit capital costs are included in the AIDA database's lending capital,

ii.) Return on equity (ROE), as an expression of the profitability and the cost of equity, in the hypothesis of the absence of arbitrage;

iii.) Return on Investment (ROI), as to evaluate the efficiency or profitability of an investment;

iv.) Return on Sales (ROS), as to measure how efficiently a company turns its sales revenue into operating profit.

The cost of debt (cost of borrowed capital from the AIDA database) is available for 11 out of 20 companies; for the remaining 9, the value is not available (n.s.) due to unconsolidated holding structures where financial expenses are allocated to subsidiaries or n.d. In the following Table 2 the company ESG scores obtained through an absolute count via content analysis is reported. The table details the keyword frequencies for each ESG pillar identified in the 2024 sustainability reports of the analyzed firms. The "Total" column is the aggregate sum of the E, S, and G pillars. Additionally, a normalized scores that reflect the relative proportion of each pillar within the total ESG word count identified per firm are reported. This control removes document length bias, correcting for the fact that larger enterprises publish more extensive reports with higher absolute occurrences.

Company	E	S	G	Total	Note	E norm (%)	S norm (%)	G norm (%)
Company 1	43	52	9	104		41.3%	50.0%	8.7%
Company 2	187	199	146	532	leader	35.2%	37.4%	27.4%
Company 3	117	64	66	247		47.4%	25.9%	26.7%
Company 4	20	28	10	58		34.5%	48.3%	17.2%
Company 5	77	65	25	167		46.1%	38.9%	15.0%
Company 6	165	166	137	468		35.3%	35.5%	29.3%
Company 7	46	80	55	181		25.4%	44.2%	30.4%
Company 8	42	65	17	124		33.9%	52.4%	13.7%
Company 9	137	186	119	442		31.0%	42.1%	26.9%
Company 10	27	34	27	88		30.7%	38.6%	30.7%
Company 11	43	100	43	186		23.1%	53.8%	23.1%
Company 12	89	37	25	151		58.9%	24.5%	16.6%
Company 13	9	6	2	17	laggard	52.9%	35.3%	11.8%
Company 14	125	354	76	555	S outlier	22.5%	63.8%	13.7%
Company 15	68	142	90	300		22.7%	47.3%	30.0%
Company 16	50	75	32	157		31.8%	47.8%	20.4%

Company 17	23	59	40	122		18.9%	48.4%	32.8%
Company 18	97	78	72	247		39.3%	31.6%	29.2%
Company 19	80	75	65	220		36.4%	34.1%	29.5%
Company 20	28	10	8	46		60.9%	21.7%	17.4%
tot	1473	1875	1064	4412				

Table 2: Company ESG Scores (Absolute Counts via Content Analysis)

The Table 3 lists the financial indicators for each company. 'n.s.': non-significant value in the AIDA database; 'n.d.': data not available.

Company	ROI (%)	ROS (%)	ROE (%)	Cost of Debt (%)	Note
Company 1	1.06	1.21	0.28	4.13	
Company 2	19.31	19.67	21.26	5.6	
Company 3	15.98	11.62	12.02	n.d.	holding
Company 4	7.32	8.19	8.38	6.75	
Company 5	3.89	1.89	-0.77	n.s.	holding
Company 6	-2.98	-4.37	0.46	10.24	
Company 7	-14.55	-42.51	-47.92	n.s.	holding
Company 8	16.57	15.42	14.29	n.s.	holding
Company 9	7.62	28.44	5.43	n.s.	holding
Company 10	6.06	4.58	4.57	n.s.	holding
Company 11	0.69	0.95	-5.88	n.s.	holding
Company 12	25.61	19.89	30.33	7.38	
Company 13	-5.4	-8.3	-10.45	5.51	
Company 14	-0.99	-49.74	0.61	8.61	
Company 15	-4.61	n.s.	0.79	n.s.	holding
Company 16	-2.91	-3.73	-13.33	2.9	
Company 17	0.3	0.1	0.17	5.19	
Company 18	n.s.	21.65	24.99	n.d.	
Company 19	-4.69	-6.19	-15.52	5.88	
Company 20	1	0.88	0.4	6.61	

Table 3: Financial Indicators (AIDA, 2024 Unconsolidated Financial Statements)

Results And Discussion

Content analysis reveals differences in sustainability disclosure practices. As the CSRD is not yet in force, there is no single standard for reporting, and each company places greater emphasis

on different aspects of ESG factors. Therefore, the quality and quantity of sustainability disclosures are indeed crucial issues that investors and financiers should pay attention to.
Table 4 shows correlation Matrix RAW ESG and norm Scores and Financial Metrics Pearson

	E raw	S raw	G raw	Total raw	E norm	S norm	G norm	n
ROE (%)	+0.352	+0.051	+0.130	+0.172	+0.324	−0.269	−0.129	20
ROI (%)	+0.328	−0.046	+0.047	+0.092	+0.377	−0.302	−0.177	19
ROS (%)	+0.158	−0.349	+0.091	−0.103	+0.345	−0.439	+0.095	19
Cost of Debt (%)	+0.508	+0.455	+0.454	+0.509	+0.028	−0.123	+0.139	11

Table 4: Correlation Matrix RAW ESG and norm Scores and Financial Metrics Pearson (r)

The quality of disclosure is a fundamental element in risk assessment by investors and lenders, as the fragmentation of standards (such as GRI, SASB, or TCFD) allows companies to engage in cherry-picking, i.e., selecting only positive indicators, or to engage in greenwashing (Gallego-Álvarez et al., 2018; Heras-Saizarbitoria et al., 2022; Macpherson and Rimmel, 2025). Given the small sample size (n=20), Spearman's rank correlation (ρ) was utilized alongside Pearson's (r), as it provides more robust and reliable estimates in the presence of small datasets and potential non-normality. Table 5 shows the correlation matrix based on Spearman.

	E raw	S raw	G raw	Total raw	E norm	S norm	G norm	n
ROE (%)	+0.339	+0.041	+0.211	+0.208	+0.177	−0.224	−0.074	20
ROI (%)	+0.191	−0.121	−0.061	−0.021	+0.267	−0.089	−0.225	19
ROS (%)	+0.234	−0.033	+0.091	+0.079	+0.232	−0.230	−0.002	19
Cost of Debt (%)	+0.418	+0.196	+0.318	+0.336	+0.127	−0.218	+0.009	11

Table 5: correlation matrix based on Spearman's (ρ) coefficients

The highest and most consistent positive correlation is found between the E pillar and financial performance metrics, namely ROE ($r = +0.35$) and ROI ($r = +0.33$). In line with previous literature, firms that communicate a higher degree of environmental engagement show better profitability indicators. This result is stable, holding true for both Pearson and Spearman correlation coefficients. The normalized Social score is negatively correlated with ROS (Pearson $r = -0.44$, $p = 0.06$), a result that approaches statistical significance ($p < 0.10$). The correlation between the total RAW ESG score and the Cost of Debt is positive ($r = +0.51$). This

counterintuitive result completely disappears when using the normalized score (r = +0.028). Thus, larger and more structured companies publish longer reports (yielding higher absolute keyword counts) and simultaneously possess more complex debt structures. This does not imply that greater disclosure leads to a higher cost of debt. The Governance dimension shows uniformly weak correlations, likely reflecting low within-sample variance in governance-related terminology (Compliance accounts for 61% of all G-pillar occurrences). Reduced variance ultimately limits the explanatory power of this variable. Results revealed that better disclosure makes companies less risky from the investors' and lenders' perspectives. Specifically, the normalised social and governance scores show a negative association with the cost of equity, suggesting that companies with more balanced disclosure are perceived as less risky, consistently with reduced information asymmetries (Lacchini and Trequattrini, 2024; Trequattrini et al., 2025). On the one hand, the lack of a single standard increases agency costs, and lenders and investors have to spend resources to interpret non-comparable data. Instead, in the light of signalling theory a robust disclosure acts as a signal of quality, reducing uncertainty (Connelly et al., 2011; Burze et al., 2020) and, consequently, the market's required risk premium. It aligns with previous studies on the role of sustainability disclosure in risk perception (Lacchini et al., 2025; Trequattrini et al., 2025).

These results can be interpreted through the lens of signalling theory (Connelly et al., 2011). The positive association between environmental disclosure and profitability indicators is consistent with a separating equilibrium: companies with genuine environmental commitments voluntarily signal this through structured and detailed reporting, thereby reducing information asymmetries with investors and lenders. Furthermore, the normalised social and governance scores show a negative association with the cost of equity (ROE), suggesting that companies with a more balanced and proportionate sustainability disclosure are perceived as less risky by investors, consistently with a separating equilibrium (Hamrouni et al., 2020). The disappearance of the cost-of-debt correlation once scores are normalised suggests that raw disclosure volume reflects firm complexity rather than ESG quality, highlighting the role of signal observability and verifiability (Bergh et al., 2014) as moderators of the signalling effect. Thus, disclosure becomes not just 'communication', but indirect evidence of a robust governance system driven by transparency. A company that monitors its emissions or supply chain is perceived as less exposed to sudden external shocks, making its credit profile more stable. These aspects appear to be in line with the new directives, which require banks to

consider them when assessing creditworthiness, as an ESG risk that is not adequately monitored could turn into a credit risk (Loizzo and Schimperna 2022; EBA/CP/2024/02).

However, if ROE, in the absence of arbitrage, can be considered equivalent to rate i, then it is also a performance indicator. This means, therefore, that being overly focused on sustainability could conflict with performance. This brings us to the debate between Trade-off Theory, which focuses on the costs of sustainability, and Value Creation Theory, which argues that sustainability creates value in the long term. This means that excessive investment in ESG activities without an immediate economic return can depress short-term profits. If the market does not immediately value these investments, a conflict of objectives arises between maximising shareholder value (shareholder primacy) and stakeholder demands.

Conclusions

This paper aimed to investigate whether companies that disclose sustainability information more thoroughly have better access to credit and risk capital. We used a qualitative-quantitative method (Hair et al., 2003; Krippendorff, 2013), which involved a content analysis in the first step and a correlation analysis in the second, on a sample of 20 Italian companies. Through a content analysis of the sustainability report downloaded from the company's website, we assigned scores for the quality and quantity of sustainability information. Then we correlated these scores with ROE, an indicator of equity capital and the cost of lending capital, as reported in the AIDA database.

First, environmental disclosure is positively associated with profitability indicators (ROE, ROI), consistent with a separating equilibrium: firms with genuine environmental commitments signal quality through structured reporting, reducing information asymmetries with investors. Second, normalised social and governance scores show a negative association with the cost of equity, suggesting that balanced, proportionate disclosure is perceived as lower risk (Hamrouni et al., 2020). Third, the positive correlation between raw ESG scores and the cost of debt disappears once scores are normalised, indicating a size effect rather than a disclosure-quality effect, highlighting the role of signal observability and verifiability (Bergh et al., 2014).

These considerations are crucial as they encourage companies to go beyond mere compliance with legal requirements. This might encourage companies to provide comprehensive and detailed sustainability disclosures rather than simply complying with regulatory requirements with minimal effort. In this perspective, high-quality disclosure acts as a positive signal for the

market, reducing information asymmetries between investors and lenders with the company (Connelly et al., 2011; Burze et al., 2020).

This evidence is relevant from both theoretical and practical perspectives. From a theoretical perspective, it fills a literature gap and advances research on the effect of sustainability disclosure on corporate risk and company valuation (Lacchini and Trequattrini, 2024; Lacchini et al., 2025; Trequattrini et al., 2025). From a practical perspective, it supports managers in understanding how adequate sustainability disclosure that goes beyond mere legislative requirements, reducing risks' perception, can be a tool for attracting investment.

This study is subject to some limitations that open up interesting avenues for future research. First, the sample is strictly limited to the fashion sector (NACE 14); while this approach effectively controls for industry heterogeneity, it inherently limits the generalizability of the findings. Second, due to the reliance on unconsolidated financial statements, data for the cost of debt was available for only 11 out of the 20 sampled firms. Future research should leverage consolidated financial statements to provide a more comprehensive overview. Additionally, we carried out the analysis under the hypothesis of the absence of arbitrage, which implies that, in the long period, the equivalence ROE = i holds only for the value of one F.Y. Future research could include comparative analyses with other countries, expanding the sample, and applying additional analytical methods.

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DIGITAL KNOWLEDGE INFRASTRUCTURES AND ACCOUNTABILITY IN GLOBAL FASHION SUPPLY CHAINS: A SYSTEMATIC LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

D'Amore Gabriella[1], Di Vaio Assunta[1], Zaffar Anum[2], Martucci Raffaella[1]

[1]Department of Law, University of Naples Parthenope, Naples, Italy

[2] Blue Shipping & Cruise Laboratory (BSCLab), Department of Law, University of Naples Parthenope, Naples, Italy

Keywords: Digital infrastructures; Supply chain accountability; Knowledge governance; Due diligence; Knowledge Accounting; Sustainability Auditing

Introduction

Recent European regulations, particularly CSRD and CSDDD, have redefined corporate accountability by extending sustainability responsibilities across increasingly fragmented and multi-tier supply chains (Karaosman et al., 2020). This challenge is especially relevant in the fashion industry, where globally dispersed production networks require firms to generate reliable sustainability evidence beyond organizational boundaries. Although digital technologies such as blockchain, AI, IoT and Digital Product Passports are increasingly recognised as enablers of traceability and transparency (Vial, 2019), recent evidence suggests that their contribution to accountability depends on organizations' ability to transform distributed information into credible and decision-relevant knowledge (Di Vaio et al., 2024).

Purpose, Aim and Research Questions

This study systematically reviews the literature to examine the relationship between digital technologies, knowledge processes and accountability in global fashion supply chains and to develop a conceptual framework of Digital Knowledge Infrastructures (DKIs). Two research questions guide the review: RQ1: How are digital technologies conceptualised as mechanisms for producing, integrating and validating sustainability evidence across multi-tier supply chains? RQ2: Under which governance conditions do digital technologies become Digital Knowledge Infrastructures capable of transforming distributed information into legitimate and auditable organizational knowledge?

Literature Review and Theoretical Framework

Research on digital technologies and supply chain accountability has expanded considerably in recent years, drawing on information systems, management and accounting perspectives (Hastig & Sodhi, 2020; Di Vaio et al., 2024). Building on accountability theory (Roberts, 1991) and the knowledge-based view of the firm (Grant, 1996), this study introduces Digital Knowledge Infrastructures (DKIs) as a conceptual framework for examining how digital technologies, organizational routines and knowledge processes interact in supporting accountability across global supply chains.

Methodology

The study adopts a Systematic Literature Review (SLR) following the PRISMA 2020 guidelines (Page et al., 2021) and established review protocols (Massaro et al., 2016). The review covers the period 1990–2025 and is based on a structured search conducted in the Scopus database (TITLE-ABS-KEY), combining four thematic domains: fashion supply chains, digital transformation, knowledge management and accountability. Bibliometric analysis using VOSviewer complements the qualitative synthesis by identifying dominant research streams.

Preliminary Findings and Contribution

Preliminary findings reveal a growing but fragmented body of research on digitalization and sustainability governance. Existing studies rarely explain how digital technologies become organizational capabilities supporting accountability. The review suggests that accountability depends not on data availability alone but on Digital Knowledge Infrastructures integrating knowledge validation and governance routines; otherwise, digitalization may result in symbolic transparency and compliance-oriented reporting.

Originality and Value

The study contributes by providing an integrative framework explaining how Digital Knowledge Infrastructures link digital transformation, Knowledge Management and accountability. While the framework remains conceptual and requires empirical validation across different institutional settings, it provides a theoretical foundation for future research and offers practical guidance for managers, auditors and policymakers implementing CSRD, CSDDD and related due diligence requirements through knowledge-based governance systems.

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LEADERSHIP, CULTURE, AND WORKFORCE RETENTION IN INDIGENOUS ORGANISATIONS: INSIGHTS FOR SUSTAINABLE MANAGEMENT PRACTICE

Atkinson, Samantha[1]; Tsoukatos, Evangelos[2]

[1]Unicaf University, Lilongwe, Malawi
[2]School of Business, University of Nicosia, Nicosia, Cyprus

Keywords: Indigenous organisations, Organisational culture, Leadership, Workforce retention, Recruitment, Sustainable management, Organisational stability, Relational accountability.

Introduction

Workforce retention and organisational stability remain pressing challenges across Canada (C.D. Howe Institute, 2025; Immigration, Refugees and Citizenship Canada, 2024). These challenges are amplified in Indigenous educational contexts, where cultural expectations, relational dynamics, and structural constraints intersect in ways that uniquely shape staff experiences (Government of British Columbia, 2023; Tessaro et al., 2021). High turnover in Indigenous schools disrupts student learning, erodes organisational stability, and places sustained demands on leadership to cultivate a stable, culturally grounded workforce. This study investigates how organisational culture, leadership practices, and relational and organisational conditions influence staff retention in an Indigenous K–12 school.

Purpose, Aim and Objectives

The purpose of this study is to examine how leadership practices, organisational culture, and relational and organisational conditions influence workforce stability and staff retention in an Indigenous school context. Relational conditions include trust, communication, belonging, and interpersonal dynamics; organisational conditions include clarity of expectations, contract stability, onboarding processes, and structural supports. These conditions are particularly significant in Indigenous contexts where relational accountability, cultural safety, and community connection are foundational to organisational life. The study addresses three research questions:

1. How is the organisational culture perceived, and how does it influence staff commitment and belonging.
2. How do leadership practices contribute to or detract from staff retention.
3. Which relational and organisational dynamics shape recruitment and retention in this Indigenous organisation.

Literature Review and Theoretical Framework

The study draws on organisational culture theory (Schein, 1992; Hofstede et al., 2010; Nanayakkara & Wilkinson, 2021; Wang'ombe, 2023; Opolot et al., 2025) to examine how shared values, norms, and assumptions shape staff experiences. Relational leadership frameworks (Khalifa, 2018) provide insight into how leaders cultivate trust, belonging, and cultural responsiveness. Indigenous scholarship emphasising relationality, reciprocity, belonging, and community responsibility (Petrone et al., 2025; Pidgeon & Riley, 2021; Preston et al., 2017) offers a culturally grounded lens. Although leadership, culture, and retention have been widely studied, with recent studies capturing recruitment shortages in British Columbia (Government of British Columbia, 2023; Walker, 2024), little empirical work explores how these dynamics intersect within Indigenous-controlled educational organisations (Tessaro et al., 2021; Mueller et al., 2011), where cultural alignment and relational accountability are central to recruitment and retention. This gap underscores the study's originality.

Methodology and Methods

A qualitative deductive case study design was employed to examine how existing theories align with lived experiences in an Indigenous school context. Data were collected through semi-structured interviews, culturally sensitive focus groups, and structured document analysis. Deductive coding, guided by the theoretical framework, was supplemented with inductive coding to capture emergent, context-specific insights. The researcher's insider–outsider positionality required sustained reflexivity, journaling, and adherence to Indigenous research ethics to mitigate bias and uphold relational accountability.

Findings and contribution

Preliminary findings reveal that cultural alignment, relational trust, and organisational stability are central to staff retention. Staff expressed strong commitment to Indigenous youth but described cultural tensions, inconsistent communication, unclear expectations, limited professional autonomy, and inadequate onboarding. Annual contract insecurity and perceived arbitrary

dismissals created fear of speaking up and reinforced factional workplace dynamics. Across staff, cultural leaders, and parents, there was a strong call to prioritise hiring Indigenous community members to strengthen cultural alignment and community connection. While relational motivations to stay were strong, structural barriers and leadership practices often outweighed these strengths, contributing to turnover.

Originality and Value

The study contributes to organisational behaviour and HRM literature by demonstrating how cultural alignment, relational trust, and organisational stability jointly shape retention in Indigenous school contexts. It advances theory by integrating Indigenous relational principles with organisational culture theory to explain retention dynamics in culturally specific environments. Practically, it provides evidence-based insights for designing recruitment and retention strategies that emphasise cultural alignment, Indigenous hiring, culturally grounded induction, relational accountability, and organisational clarity.

Research Limitations

The researcher's insider positionality and leadership transitions during the study period may have influenced participant perceptions. The single-site design limits transferability.

Theoretical and Practical Implications

Theoretically, the study refines understanding of how organisational culture and relational leadership interact in Indigenous educational settings. Practically, it offers guidance for leaders seeking to strengthen recruitment, enhance retention, and build culturally grounded, stable organisational environments that honour community values.

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INVISIBLE TRANSITIONS, VISIBLE IMPACT: MENOPAUSE, WORK PERFORMANCE, AND INCLUSION IN UK HIGHER EDUCATION

Niki Kyriakidou[1]; Nadia Veitch[2], Theocharis Ispoglou[3]

[1] Leeds Business School. Leeds Beckett University, UK.
[2] Leeds Business School. Leeds Beckett University, UK.
[3] CSS DW Carnegie School of Sport, Leeds Beckett University

Keywords: Menopause; Diversity, Equity and Inclusion; Higher Education; Workplace Wellbeing; Employee Retention; Organisational Support.

Menopause is an important but often overlooked issue in the workplace, affecting more workers in higher education (HE). Despite increased focus on diversity, equity, and inclusion (DEI), menopause remains marginal in policies. This study examines how menopausal transitions influence work performance, wellbeing, and careers among academics and staff at a major university in Northern England, and assesses support systems. Menopause is now seen as a workplace wellbeing and equality issue rather than just a private health matter, with UK guidance noting symptoms may be a disability under the Equality Act 2010 if they have substantial, long-term effects (Equality and Human Rights Commission, 2024). Research links menopausal symptoms with reduced productivity, absenteeism, and employee retention (CIPD, 2023; UK Government, 2025).

Presented as a pilot for the UK HEIF-funded PERI-MENO project, this research analyses workplace challenges and perceptions of management support during the peri- and post-menopausal phases. The wider project uses a co-production model with stakeholders to create an evidence-based organisational toolkit to foster menopause-inclusive workplaces through policy reform, management training, and scalable wellbeing programs.

Theoretical Framework

The study is underpinned by a theoretical framework that blends workplace wellbeing, gendered ageism, and intersectionality, recognising that organisational culture, stigma, and

structural inequalities shape menopausal experiences (Riach et al., 2021; Brewis, 2025). Factors such as workload, flexibility, managerial support, and working conditions influence how menopausal employees cope with symptoms and their productivity (Brewis et al., 2017; CIPD, 2023). Gendered ageism shows that midlife women face stereotypes linking them to declining competence, resilience, or commitment, reinforcing exclusionary norms such as the "ideal worker" (Steffan, 2025; Grandey et al., 2020). An intersectional approach additionally acknowledged that menopausal experiences vary by ethnicity, disability, caring duties, role, and socio-economic status, demonstrating that menopause isn't universal (Crenshaw, 1989; Riach et al., 2021; Jack et al., 2019).

Design/Methodology/Approach

A qualitative research design was adopted, and 17 semi-structured interviews were conducted with scholarly and professional staff across various stages of menopause. Ethical clearance was obtained before the interviews began to ensure respondents' anonymity, confidentiality, and voluntary participation. Data analysis used thematic analysis, focusing on health symptoms, work performance, disclosure practices, and perceived organisational support.

The analysis is grounded in a comprehensive conceptual framework that merges Social Cognitive Theory (Bandura, 1986), Conservation of Resources Theory (Hobfoll, 1989), the Job Demands–Resources model (Bakker & Demerouti, 2007), and Gendered Organisation Theory (Acker, 1990). These combined frameworks present a multi-level perspective on how menopausal experiences relate to organisational demands, available resources, and cultural norms.

Findings

Findings show that menopause considerably affects cognitive function, emotional management, and physical health, resulting in decreased focus, confidence, and productivity. Participants described an "invisible strain," highlighting the extra effort required to sustain performance despite symptoms such as fatigue, anxiety, and memory issues. Physical issues such as sleep problems and hot flushes additionally hinder daily functioning and attendance. The study showed four main themes: firstly, cognitive and emotional challenges impair job performance, particularly in roles requiring mental effort; secondly, physical symptoms impose functional limitations on daily activities; thirdly, stigma and fear of revealing health issues prevent employees from seeking help, fostering organisational silence; fourthly, perceptions of managerial support differ, with professional staff facing more structural obstacles due to

reduced autonomy. The findings also reveal a disconnect between formal policies and employees' real experiences.

Practical Implications

Current wellbeing initiatives tend to be fragmented and insufficiently customised, which can diminish job satisfaction, boost absenteeism, and increase turnover, especially among mid-career women—an essential group for leadership growth (Brewis et al., 2017; Equality and Human Rights Commission, 2024).

During the exploratory phase of the PERIMENO project, these insights help co-create a practical organisational toolkit for employers, policymakers, and HR professionals. This toolkit offers clear guidance on menopause-related HR policies, manager training to foster awareness and empathy, flexible work options, and peer support systems to combat stigma and facilitate safe disclosures. By working with stakeholders such as healthcare partners and innovation networks, the project strives to turn research into adaptable workplace programs and policy-focused actions that support organisational performance and employee wellbeing.

Originality/Value

This research furthers DEI and HRM scholarship by framing menopause as a strategic organisational concern connected to gender equity, workforce sustainability, and inclusion. As a pilot project within a HEIF-funded, interdisciplinary research and knowledge exchange initiative, it links lived experiences with organisational action, providing both conceptual insight and practical tools.

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EMBRACING NEURODIVERSITY WITHIN THE TECHNOLOGY SECTOR IN THE UK

Baynham, Ian [1]; Niki Kyriakidou[2], Abraham Stefanidis[3] Chinta, Alfred[4]

[1] Leeds Business School. Leeds Beckett University, UK.
[2] Leeds Business School. Leeds Beckett University, UK.
[3] The Peter J. Tobin College of Business, St. John's University
[4] Leeds Business School. Leeds Beckett University, UK

Keywords*:* Diversity and Inclusion (D&I); Neurodiversity; Autism Spectrum Disorder (ASD); Cognitive diversity; Medical model of disability; Social model of disability; Workplace inclusivity; EDI Strategy.

Diversity, equity, and inclusion (DEI) are key to an organisational culture that embraces differences to enhance innovation and success. In the UK human resource management (HRM) context, the focus has primarily been on gender and ethnic diversity (Coyle, 2020), with only limited emphasis on neurodiversity and cognitive diversity. Although neurodiversity is increasingly acknowledged as part of organisational diversity, it remains underrepresented in mainstream HRM and DEI scholarship, which largely privileges traditional demographics over cognitive inclusion (Fitzsimmons et al., 2023). In 2023/2024, only 30.2% of autistic adults were employed, compared with 54.7% of disabled and 82.0% of non-disabled people (House of Commons Library, 2025). Evidence presented to the UK Parliament in 2025 suggests that just 15% of autistic adults are in full-time work, while the Buckland Review estimates that 31% are employed (DWP, 2024; UK Parliament, 2025; UK Government, 2025).

This research focuses on the UK technology sector, where recent policy discussions and industry research further suggest that neurodiversity is significantly under-recognised (Tech Talent Charter, 2024). It examines DEI practices at "Amberluz Entertainment" (pseudonym), a leading global digital company in the online betting and gaming industry, with a focus on fostering a diverse and inclusive culture.

This study's conceptual framing integrates Singer's (1999) neurodiversity scholarship and den Houting's (2019) paradigm shift, reframing neurological diversity as natural and valuable rather than a deficit. Building on this and Pearson and Rose's (2021) analysis of autistic masking, the study adopts a holistic, organisational-level framework to examine how structures, leadership, and DEI systems shape neurodivergent employees' experiences.

After receiving ethical clearance from a UK university and "Amberluz Entertainment," we collected data from employees in Northern England using a qualitative research design in two sequential phases. In 2022, we conducted in-depth, semi-structured interviews with 10 neurodivergent employees to explore their experiences of neurodiversity, organisational support, and inclusion practices. In 2024, a follow-up data collection round included 10 additional interviews with neurodivergent employees using a closely aligned question set to assess how their experiences had evolved over time and in response to organisational change. Comparative and thematic analyses across the two phases reveal ongoing practices and limited system improvements, emphasising the resilience of individual strategies.

The findings reveal that interviewees' negative sentiment persists, underscoring the need for more targeted interventions and cultural shifts to foster greater inclusivity. More specifically, the interviews demonstrate that neurodivergent employees develop resilience, coping strategies, and insight individually, while organisational systems remain implicitly neurotypical, resulting in widespread masking, uneven psychological safety, inconsistent support, and a reliance on informal networks rather than structurally embedded neuro-inclusion.

This study makes three key contributions. Conceptually, it develops a holistic, organisational framework for neuro-inclusion based on neurodiversity, moving beyond medical and social models. From an organisational perspective, it demonstrates how structures, leadership, and DEI systems influence neurodivergent employees, and offers practical ways to embed sustainable inclusion in high-tech workplaces. Policy-wise, it highlights gaps between DEI commitments and actual experiences, guiding clearer DEI strategies and management support for neurodivergent employees.

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CONSUMER DETERMINANTS OF ELECTRIC VEHICLE DEMAND: INSIGHTS FROM BEHAVIOURAL THEORY AND THE SLOVAK MARKET

Khalilov, Ismayil[1] ; Táborecká, Janka[2]

[1]Faculty of Economics, Matej Bel University, Banska Bystrica, Slovakia

[2]Faculty of Economics, Matej Bel University, Banska Bystrica, Slovakia

Keywords: electric vehicles, consumer behaviour, Theory of Planned Behaviour, sustainability, charging infrastructure, Slovakia.

Abstract

This paper develops a theory-driven conceptual framework to explain individual consumer adoption of electric vehicles (EVs) from a sustainability-oriented perspective. Building on the Theory of Planned Behaviour (TPB) and its applications in sustainable consumption research, the study systematically reviews high-quality academic literature to examine how attitudes, subjective norms, and perceived behavioural control shape EV-related decision-making. Particular attention is given to environmental sustainability and ESG-related considerations, extending the traditional TPB framework to the domain of sustainable mobility.

Adopting a structured literature review approach, the paper proposes an integrated TPB-based model tailored to EV adoption, incorporating psychological, economic, infrastructural, and ESG-related determinants. The framework is further enriched by policy-relevant factors—such as financial incentives, regulatory support, and charging infrastructure—which influence consumer perceptions and behavioural control. To enhance practical applicability, the model is operationalised through the development of measurement items, demonstrating its suitability for future empirical testing using methods such as structural equation modelling.

The Slovakia is used as a representative small European market to contextualise the analysis and highlight policy relevance. The primary contribution of the study lies in bridging consumer behaviour theory with ESG and policy-oriented perspectives by offering an integrated and operationalizable framework for analysing EV adoption. The findings provide a foundation for future empirical research and offer actionable insights for policymakers and managers aiming to accelerate the transition toward sustainable mobility.

Introduction

The transition toward sustainable mobility has positioned electric vehicles (EVs) as a central component of contemporary environmental, energy, and transport policies across Europe, where road transport remains a primary contributor to greenhouse gas emissions (European Environment Agency, 2023; International Energy Agency, 2022). Beyond their environmental function in reducing emissions and supporting long-term climate neutrality objectives, EVs are increasingly embedded within broader Environmental, Social, and Governance (ESG) frameworks. Since the early 2000s, driven by institutional developments like the United Nations Global Compact and the Principles for Responsible Investment (PRI), ESG has evolved from a normative concept into a central paradigm guiding corporate strategies and public policy. In the context of mobility, this evolution reinforces the critical need to understand not only technological innovations but also the behavioural and societal acceptance of sustainable solutions like EVs.

Despite strong policy support and technological progress, EV adoption remains uneven across European countries, with Slovakia representing a particularly illustrative case. Although Slovakia is one of Europe's leading automotive producers in terms of vehicles manufactured per capita, domestic EV adoption continues to lag significantly behind the European Union average (ACEA, 2023). Recent evidence indicates that battery electric vehicles (BEVs) accounted for only 2.2% of newly registered passenger cars in Slovakia in 2024, compared to 19.1% in the EU overall (Cvacho & Madleňák, 2026). This discrepancy highlights a structural gap between manufacturing production capacity and domestic consumer adoption, suggesting that supply-side advancements alone are insufficient to drive the transition toward sustainable mobility.

Existing research shows that EV adoption is a complex decision-making process shaped by an interplay of economic, psychological, social, and infrastructural factors. Financial barriers such as high upfront costs and perceived economic risk remain significant (Rezvani et al., 2015), while behavioural determinants—including attitudes, subjective norms, and perceived behavioural control—play a critical role in shaping adoption intentions, as conceptualized in the Theory of Planned Behaviour (Ajzen, 1991). These behavioural mechanisms are further influenced by contextual factors such as charging infrastructure, government incentives, and institutional trust (Li et al., 2017). More recently, sustainability awareness and ESG-related perceptions have emerged as additional drivers of consumer decision-making.

To capture these interrelationships, a growing body of literature applies TPB as a foundation for analysing EV adoption. While TPB provides a robust framework for understanding behavioural intentions, its integration with ESG-related dimensions remains limited. Existing studies often focus on isolated determinants or rely on single empirical approaches, resulting in fragmented insights. Moreover, empirical evidence from Central and Eastern Europe remains scarce, limiting generalisability.

Against this background, this study adopts a literature-based and conceptual approach to advance understanding of EV adoption behaviour. Building on TPB and sustainability research, the paper develops an integrated model combining behavioural, economic, infrastructural, and ESG-related determinants. The model is operationalised through measurement items, demonstrating applicability for future empirical research using structural equation modelling. Focusing on Slovakia, this study addresses a regional gap while offering insights relevant to other emerging European markets. It aims to bridge consumer behaviour theory with sustainability and policy perspectives, providing a foundation for future research and for policymakers and managers seeking to accelerate EV adoption.

Aim and Objectives

Aim of the Study

The primary aim of this study is to develop a theory-driven conceptual framework that explains individual consumer adoption of electric vehicles (EVs) by integrating insights from the Theory of Planned Behaviour (TPB) and prior sustainability-oriented EV adoption research. Rather than generating new empirical evidence, the paper adopts a literature-based approach to systematically organize and synthesize existing findings and to adapt TPB constructs to the context of sustainable electric mobility.

By focusing on individual-level behavioural determinants and their interrelationships, the study seeks to advance a structured conceptual understanding of EV adoption that can serve as a foundation for future empirical testing. The Slovak context is employed as a representative small European market to enhance the practical relevance of the proposed framework.

Objectives of the Study

To achieve this aim, the study pursues the following specific objectives:

• To review and critically assess the application of consumer behaviour theories in prior EV adoption research, with particular emphasis on the Theory of Planned Behaviour and its use in sustainability-oriented consumption contexts.

• To identify and systematize the core behavioural, economic, and contextual determinants of individual EV adoption documented in existing European-focused empirical studies, including psychological factors, perceived behavioural control elements, and external enabling conditions.
• To develop an original TPB-based conceptual model of electric vehicle adoption, integrating sustainability and ESG-related considerations relevant to contemporary mobility transitions.
• To operationalize the proposed conceptual model by outlining representative measurement items for each construct, demonstrating how the framework can be translated into a structured questionnaire for future empirical investigation.
• To discuss the theoretical and practical implications of the proposed model for policymakers, industry stakeholders, and future academic research, particularly in the context of accelerating EV adoption in Slovakia and comparable European markets.

Literature Review

Building on the Theory of Planned Behaviour (TPB) and prior research on sustainable consumption and electric vehicle (EV) adoption, this study proposes a conceptual model that integrates behavioural, contextual, and sustainability-related determinants of EV adoption. This model serves as the basis for the development of measurement items presented in the following section (Figure 1). Consumer behaviour research offers a strong theoretical foundation for explaining individual adoption decisions related to EVs. Among the most influential frameworks is the TPB, originally developed by Ajzen (1991). According to TPB, an individual's behavioural intention is determined by three core components: attitudes toward the behaviour, subjective norms, and perceived behavioural control. This framework has been widely applied in EV adoption research to capture the psychological mechanisms underlying consumers' willingness to purchase and use electric vehicles.

The concept of perceived behavioural control in TPB parallels the construct of perceived ease of use in the Technology Acceptance Model (TAM), which focuses on technology adoption (Ajzen, 2020). Unlike TAM, which is content-specific and primarily designed for technological contexts, TPB is a general framework applicable to a wide range of behaviours, including sustainable consumption choices such as EV adoption. Integrating insights from TAM can help operationalize perceived control and attitude constructs in the EV context, particularly regarding infrastructure usability and technological familiarity."

A substantial body of empirical literature confirms the explanatory power of TPB in the EV context. Positive attitudes toward EVs—often driven by environmental awareness, fuel cost savings, and technological novelty—significantly enhance purchase intention (Rezvani et al., 2015; Wang et al., 2018). Beyond individual attitudes, these environmental and sustainability-oriented motivations can also be contextualized within the Environmental, Social, and Governance (ESG) framework. ESG emphasizes the interconnection of environmental stewardship, social responsibility, and governance practices, reflecting broader societal expectations that influence consumer decision-making (Meiden & Silaban, 2023; Estevez-Mendoza & Infante, 2025). By incorporating ESG considerations, EV adoption can be seen not only as a personal choice but also as a response to broader environmental and social imperatives.

Perceived behavioural control plays a decisive role in EV adoption decisions. Factors such as charging availability, driving range, and perceived ease of use strongly influence consumers' sense of control and their adoption intentions (Egbue & Long, 2012; Skippon & Garwood, 2011). ESG-aligned governance and policy measures—such as government incentives, subsidies, and infrastructure investment—can enhance perceived behavioural control by reducing practical barriers and improving accessibility (Meiden & Silaban, 2023).

Subjective norms, referring to perceived social pressure from family, peers, and society, also significantly shape EV adoption intentions. Social influence is particularly relevant in the early diffusion stages of innovative technologies, where consumers rely on social validation to reduce uncertainty (Rogers, 2003; Jansson et al., 2017). ESG-driven social initiatives and public awareness campaigns further reinforce these norms by promoting sustainable mobility as a societal standard (Estevez-Mendoza & Infante, 2025).

Beyond TPB, complementary perspectives such as perceived risk theory help explain consumer resistance toward EVs. Financial risk, performance uncertainty, battery lifespan concerns, and resale value anxiety are repeatedly identified as major adoption barriers (Tanaka et al., 2014; Lin & Wu, 2018). Similarly, innovation resistance theory highlights how habitual reliance on internal combustion engine vehicles can delay acceptance of alternative technologies (Ram & Sheth, 1989). ESG-oriented policies can mitigate such barriers by providing clearer regulatory guidance, performance standards, and incentives for green innovation (Meiden & Silaban, 2023; Estevez-Mendoza & Infante, 2025).

Perceived behavioural control in EV adoption is heavily influenced by access to charging infrastructure. Recent evidence shows that while PEVs can be charged from standard domestic outlets, slow charging and limited accessibility constrain consumer adoption. Dedicated

infrastructure, such as Level 2 and DC fast chargers, not only facilitates longer electric driving distances but also enhances consumer confidence and perceived control over vehicle usage (Hardman et al., 2021). Infrastructure planning should consider both consumer usage patterns and grid management, with BEVs and PHEVs requiring different charging strategies due to differences in battery capacity and reliance on internal combustion engines

Value-based and moral norm perspectives further emphasize the role of environmental concern and personal values in fostering EV adoption. The Value–Belief–Norm (VBN) theory suggests that individuals with strong ecological values and moral obligations toward sustainability exhibit higher willingness to adopt EVs (Nordlund & Garvill, 2003; Rezvani et al., 2018). In this context, ESG provides a practical and normative framework that aligns personal values with organizational and societal expectations, creating an enabling environment for sustainable consumption choices.

Recent research increasingly adopts integrated models combining TPB with perceived risk, moral norms, and contextual variables to improve explanatory power (Wang et al., 2017; Hardman et al., 2021). These hybrid approaches demonstrate that EV adoption is shaped by the interplay of psychological, economic, infrastructural, and sustainability-oriented factors. ESG considerations serve as a critical contextual layer, linking individual adoption behaviour to organizational, social, and policy-driven influences, particularly in emerging EV markets where structural and cultural conditions differ from early-adopter countries.

Consumer adoption of EVs is influenced by psychological factors, policy interventions, and socio-economic contexts. Market failures, such as pollution externalities, can make EVs more expensive than internal combustion vehicles, reducing adoption without corrective measures. Demand-side instruments, including consumer subsidies, are critical during early commercialization; however, their effectiveness depends on consumer familiarity, visibility of EVs, and technological radicalness (Sierzchula et al., 2014). Radical innovations like EVs involve higher uncertainty, limiting the utility of financial incentives and necessitating complementary measures such as awareness campaigns, infrastructure development, and supportive governance (IPCC, 2012; Egbue & Long, 2012).

Environmental and symbolic motives significantly influence EV adoption. Consumers with strong ecological values are more likely to adopt EVs due to their lower environmental impact, while early adopters may also seek social recognition (Noppers et al., 2014). However, adoption is constrained by technological uncertainty and performance limitations, making policy incentives important for market growth. In the Slovak context, infrastructure availability and

financial incentives have been identified as key barriers to BEV adoption, directly influencing consumers' perceived behavioural control and purchase intentions (Cvacho & Madleňák, 2026). According to the Slovak Electromobility Association (SEVA), as of March 31, 2025, there were 17,430 battery electric vehicles (BEVs) of categories M1 and N1 registered on Slovak roads. In March 2025, BEVs accounted for a record 4.7% of all new vehicle registrations in Slovakia, compared to the European Union average of 15.3% (SEVA, 2025). However, data from the Slovak Ministry of Interior reveals that annual EV registrations do not show steady growth, but rather fluctuating trends: 2,505 in 2022, 3,470 in 2023 (a 38.5% increase), followed by a decline to 3,073 in 2024 (an 11.4% decrease), and just 1,098 registrations in the first three months of 2025. If the 2025 pace continues evenly throughout the year, it would project to around 4,392 registrations—an increase of about 43% compared to 2024. These variations suggest that EV adoption in Slovakia remains sensitive to changing incentives, economic conditions, and consumer perceptions, indicating an evolving but still cautious acceptance of electric vehicles among Slovak consumers (Ministerstvo vnútra SR, 2025).

As shown in Figure 1, the model is grounded in the Theory of Planned Behaviour (Ajzen, 1991, 2020), while incorporating additional determinants such as environmental concern, infrastructure, and policy-related factors identified in the EV adoption literature.

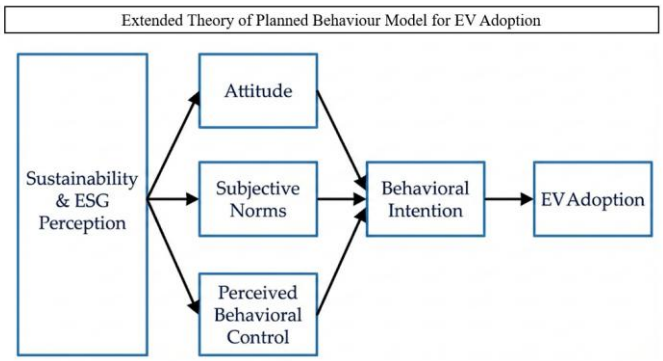


Figure 1. Extended Theory of Planned Behaviour model for electric vehicle adoption, adapted from Ajzen (1991, 2020) and enriched with sustainability (ESG)-related determinants based on prior literature.

Determinants of Electric Vehicle Consumption

Electric vehicle (EV) consumption is shaped by a combination of psychological, social, economic, infrastructural, and sustainability-related determinants. Building on the Theory of Planned Behaviour (TPB), perceived risk, and ESG frameworks provides a comprehensive understanding of these factors.

Psychological determinants

Psychological factors are central to EV consumption decisions. In line with TPB, attitudes, subjective norms, and perceived behavioural control jointly shape consumers' intentions to adopt EVs (Ajzen, 1991).

Attitudes: Positive attitudes toward EVs are driven by environmental awareness, anticipated driving experience (smoothness, noise reduction), and perceived technological reliability (Rezvani et al., 2015). However, attitudinal support often depends on functional performance; unresolved concerns regarding driving range, charging time, or battery durability can prevent actual adoption (Egbue & Long, 2012; Skippon & Garwood, 2011).

Subjective Norms: Peer influence, social visibility, and symbolic value associated with environmentally responsible consumption reinforce psychological motivation (Jansson et al., 2017). Early adopters legitimize EVs, particularly in emerging markets, reducing uncertainty for subsequent consumers (Rogers, 2003).

Perceived Behavioural Control: Assessments of affordability, driving range, and charging accessibility are critical for confidence in using EVs under everyday conditions (Wang et al., 2018). Low perceived control can prevent even highly favourable attitudes from translating into actual purchase decisions (Ajzen, 1991).

Economic determinants

Financial considerations remain among the strongest determinants of EV consumption.

Cost Barriers**:** Higher upfront prices of EVs compared to internal combustion engine vehicles often discourage adoption, despite lower operating costs over the vehicle's lifetime (Lieven et al., 2011; Hardman et al., 2017). Consumers frequently rely on simplified heuristics rather than total-cost-of-ownership calculations, leading to overestimation of financial risk (Dumortier et al., 2015).

Policy Incentives: Purchase subsidies, tax exemptions, and predictable incentive schemes significantly increase adoption rates by lowering perceived financial risk (Sierzchula et al., 2014). Effectiveness depends on monetary value, clarity, and stability, as policy uncertainty can reduce consumer commitment (Hardman et al., 2018).

Infrastructural determinants

The availability, accessibility, and reliability of charging infrastructure constitute key determinants of EV consumption.

Public Infrastructure: Range anxiety caused by insufficient chargers negatively affects adoption. Perceived infrastructure adequacy—based on visibility, familiarity, and ease of access—can be as important as actual charger density (Franke et al., 2012; Neubauer & Wood, 2014).

Home Charging: Access to private parking or home charging facilities significantly increases adoption intentions, highlighting structural inequalities in consumption opportunities (Axsen et al., 2015). Integrated infrastructure planning and public awareness campaigns enhance perceived behavioural control.

Sustainability and ethical determinants

Sustainability-related motivations support EV consumption but rarely override financial or convenience barriers.

Environmental Concern: Pro-environmental attitudes positively influence EV adoption, particularly when aligned with supportive financial conditions and infrastructure (Nordlund & Garvill, 2003; Rezvani et al., 2018).

Ethical Considerations: Concerns regarding battery production, resource extraction, and energy sourcing can affect adoption decisions if not mitigated through transparent communication and sustainable supply chains (Hawkins et al., 2013).

ESG Influence: Environmental, social, and governance (ESG) frameworks reinforce moral and normative motivations, linking personal ecological values with societal expectations and policy support (Meiden & Silaban, 2023; Estevez-Mendoza & Infante, 2025).

Integrated perspective

Recent literature emphasizes the interplay of psychological, social, economic, infrastructural, and ESG-related factors in shaping EV consumption. Hybrid models combining TPB with perceived risk, moral norms, and contextual variables provide higher explanatory power, particularly in emerging markets where adoption is influenced by structural, cultural, and policy differences (Wang et al., 2017; Hardman et al., 2021).

Table 1. Synthesis of Literature

Determinant Category	Specific Factors Identified in Literature	Related TPB Construct	Key Supporting References
Psychological Determinants	Environmental awareness, perceived technological reliability, expected driving experience	Attitude toward the behavior	Ajzen (1991); Rezvani et al. (2015); Egbue & Long (2012)
	Social influence, peer pressure, visibility of EV usage, symbolic value	Subjective norms	Rogers (2003); Jansson et al. (2017); Haustein & Jensen (2018)
	Perceived affordability, range adequacy, charging accessibility, ease of use	Perceived behavioral control	Ajzen (1991); Wang et al. (2018); Skippon & Garwood (2011)

Determinant Category	Specific Factors Identified in Literature	Related TPB Construct	Key Supporting References
Financial Determinants	High upfront purchase price, price sensitivity, income constraints	Perceived behavioral control	Lieven et al. (2011); Hardman et al. (2017)
	Total cost of ownership misperception, reliance on cost heuristics	Attitude / Perceived behavioral control	Dumortier et al. (2015); Tanaka et al. (2014)
	Purchase subsidies, tax exemptions, financial incentives	Perceived behavioral control	Sierzchula et al. (2014); Hardman et al. (2018)
Infrastructure-Related Perceptions	Public charging availability, charger visibility, charging time	Perceived behavioral control	Franke et al. (2012); Neubauer & Wood (2014)
	Home charging access, private parking availability	Perceived behavioral control	Axsen et al. (2015); Egbue & Long (2012)
Sustainability & Ethical Considerations	Environmental concern, climate awareness	Attitude toward the behavior	Nordlund & Garvill (2003); Rezvani et al. (2018)
	Ethical concerns (battery production, energy mix, lifecycle emissions)	Attitude / Moral norms (extended TPB)	Hawkins et al. (2013); Hardman et al. (2021)

Methodology and Methods

Research design

This study adopts a qualitative, literature-based research design aimed at synthesising existing academic knowledge on electric vehicle (EV) consumption from an individual consumer behaviour perspective. Rather than collecting primary data, the paper conducts a structured narrative review of peer-reviewed journal articles, academic books, and relevant policy reports, following established methodologies for conceptual and literature-based research (Tranfield et al., 2003; Snyder, 2019). This design enables the development of a TPB-based conceptual framework by systematically integrating psychological, financial, infrastructural, and sustainability-related determinants identified in prior research. The approach is consistent with the study's objective of extending the Theory of Planned Behaviour to the context of EV adoption and sustainability transitions.

Literature selection criteria

Relevant literature was identified through comprehensive searches of Scopus, Web of Science, and Google Scholar. Search terms were selected to capture a broad spectrum of EV adoption

research, including “electric vehicle adoption”, “consumer behaviour”, “Theory of Planned Behaviour”, “sustainability”, and “charging infrastructure”.

Priority was given to peer-reviewed studies published in high-impact journals. Particular attention was paid to studies focusing on European markets, and where available, Slovakia, to ensure contextual relevance. Only studies with clear theoretical grounding, empirical rigor, and transparent methodology were included. Policy documents and industry reports were used selectively to complement academic findings and to provide contextual insights, particularly regarding regulatory frameworks and infrastructure development.

Analytical approach

The selected studies were analysed using thematic synthesis, allowing the identification and categorisation of key determinants across the literature (Braun & Clarke, 2006; Thomas & Harden, 2008). Determinants were coded into four overarching themes aligned with the conceptual framework:

Psychological determinants – attitudes, subjective norms, perceived behavioural control.

Financial determinants – purchase cost, subsidies, perceived economic risk.

Infrastructure-related determinants – charging availability, reliability, home charging feasibility.

Sustainability and ethical determinants – environmental concern, ESG-related perceptions.

This structured coding approach enables the integration of findings from heterogeneous studies while maintaining conceptual consistency. The results of this synthesis form the foundation for the proposed conceptual model presented in Figure 1 and support the subsequent operationalization of measurement items.

Research scope and rigor

To ensure rigor, a systematic selection process was applied, focusing on studies with strong theoretical and methodological foundations. Preference was given to research grounded in established consumer behaviour frameworks, particularly the Theory of Planned Behaviour (Ajzen, 1991).

While the literature-based approach does not allow for empirical generalisation, it enables the development of a theoretically robust and integrative framework. This is particularly appropriate for emerging research areas such as EV adoption, where multiple interacting determinants must be conceptualised before empirical testing.

Conclusion

This study presents a conceptual framework explaining individual EV adoption by integrating the Theory of Planned Behaviour (TPB) with sustainability and policy insights. Key

determinants—attitudes, subjective norms, and perceived behavioural control—interact with economic, social, and infrastructural factors to shape consumer intentions. Findings indicate that environmental awareness alone is insufficient; adoption also depends heavily on cost, charging infrastructure, and social influences. Within this dynamic, ESG and policy measures, such as subsidies and targeted incentives, play a crucial role in reducing practical barriers and promoting broader market adoption. In Slovakia, uneven and fluctuating EV growth strongly reflects these infrastructural and economic constraints, highlighting an urgent need for targeted, context-specific interventions rather than supply-side advancements alone.

Consequently, from a practical and managerial perspective, this extended TPB framework offers highly actionable strategies for automotive managers, distributors, and dealerships operating in small European markets like Slovakia. Since the model underscores that perceived behavioural control and ESG perceptions function as critical entry barriers, distributors cannot continue to rely solely on standard vehicle specifications or traditional, feature-based advertising. To effectively mitigate consumers' infrastructure anxiety and enhance their perceived behavioural control, distributors should actively adopt 'product-service bundling' strategies. This includes integrating home-charging station installations directly into the vehicle purchase price or forming strategic alliances with local public charging network providers to offer predictable, multi-year subscription discounts.

Furthermore, given the significant role of macro ESG perceptions in actively shaping individual consumer attitudes, marketing managers must transition toward transparent, purpose-driven ESG communication. Highlighting battery lifecycle circularity, supply chain ethics, and the corporate fleet’s direct contribution to green financial metrics will better resonate with both eco-conscious retail buyers and institutional B2B clients. Ultimately, by bridging individual consumer psychology with these structural industry adaptations, the proposed framework provides a robust foundation for future empirical research and offers practical guidance for policymakers and industry stakeholders aiming to accelerate the transition toward sustainable mobility in emerging EU regions.

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POLICY AS AN ENABLER: THE ROLE OF POLICYMAKERS IN ADVANCING VIABLE CSR PRACTICES.

Drammeh Lamin

University of The Gambia, School of Business and Public Administration
University of Lahore, Lahore Business School, UOL, Lahore, Pakistan

Keywords: Corporate Social Responsibility, policymakers, regulation, The Gambia, Viable Practices, institutional capacity

Abstract

Introduction

Corporate Social Responsibility (CSR) is widely recognised as a voluntary corporate mechanism for advancing social, environmental, and economic welfare (Sorour et al., 2021, Wirba, 2024, Zhang et al., 2025). Yet CSR implementation in many developing countries remains inconsistent (Jia et al., 2019).

Purpose. Aim and Objective

This study examines how policymakers shape CSR viability in The Gambia, shifting attention from firm-centred explanations to the policy and institutional context that enables or constrains corporate contributions to development.

Literature Review

Although policymakers are increasingly recognised as critical actors due to their regulatory authority, they remain marginalised in CSR design and implementation processes (Shah and Khan, 2021). Existing studies emphasize financial and reputational benefits of CSR, while offering limited insight into how policy frameworks and institutional capacities support its effective implementation (Arhinful et al., 2025). This oversight has significant implications, as policymakers face challenges including regulatory complexity, limited capacity, insufficient CSR expertise, and misalignment between corporate initiatives and national development priorities.(Zueva and Fairbrass, 2021).

Methodology and Methods:

Through stakeholder theory and empirical CSR frameworks, the qualitative case study employed systematic document analysis (n = 24) and semi-structured interviews (n = 18) to explore stakeholders' conceptualisations of CSR. Documents consisted of national policies (e.g., National Development Plan 2018-2025), regulatory guidelines, and CSR/sustainability reports from the ten largest companies (2020-2025), and donor/NGO assessments from relevant and publicly accessible. All texts were coded thematically in NVivo to identify policy, regulatory, and implementation patterns. Interviews involved 4 national/sub-national policymakers, 8 corporate actors (CEOs/CSR and 8 CSR practitioners/NGO/donor representatives within 35 minutes, and transcribed verbatim and analysed alongside documents. Rigor was strengthened via methodological triangulation, respondent validation of emerging themes, and establishment and maintenance of an audit trail.

Main Findings and Contribution:

The analysis identified four evidence-based outcomes. First, fragmented regulatory structures led to disjointed CSR implementation, with conflicting reporting requirements undermining effective monitoring and enforcement. Second, significant capacity and resource limitations exist, as regulators often lack dedicated CSR units, technical expertise, and adequate budgets to oversee compliance and monitor corporate projects. Third, many CSR initiatives remain poorly aligned with national development priorities, particularly the National Development Plan, as projects are largely short-term and produce limited developmental impact. Fourth, companies predominantly adopt descriptive rather than outcome-based reporting practices, resulting in symbolic compliance and weak accountability regarding social and environmental outcomes (Zueva and Fairbrass, 2021). Although politicians play important roles in regulation, coordination, capacity building, and performance monitoring, their effectiveness is constrained by institutional fragmentation and limited resources.

Originality and Value

The paper redefines CSR from purely voluntary or philanthropic to a structured, policy-driven strategy. It highlights the government's role as a facilitator of sustainable business practices by regulating, providing incentives, and implementing accountability mechanisms. The study demonstrates how public policies can align business activities with national development priorities

and the Sustainable Development Goals (SDGs), while facilitating innovation, competitiveness, and collaboration among businesses, civil society, and the public sector.

Research Limitation

The limits of this study include a single-country scope and reliance on a qualitative approach, which may limit the reliability of findings. Future studies should employ mixed methods and comparative or longitudinal designs to test the proposed institutional reforms and to measure CSR outcomes over time.Abstract

Theoretical and Practical Applications/Implications

Drawing on documentary evidence and stakeholder perspectives, the study identifies best practice recommendations for improving CSR governance. This includes suggestions to create an inter-ministerial coordination unit to oversee CSR, develop standardized CSR reporting frameworks, require companies to disclose their CSR, and implement a capacity-building program for local governments. The study also recommends performance-based incentives (such as conditional tax credits and expedited permitting) supported through monitoring and evaluation mechanisms. Overall, the study contributes to CSR governance scholarship by highlighting the enabling and constraining roles of policymakers in a low-income country.

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The Impact of Green HRM on Employee Attitudes and Performance in Gambian Five-Star Hotels

Lamin Drammeh

University of The Gambia, School of Business and Public Administration, The Gambia

University of Lahore, Lahore Business School, UOL, Lahore, Pakistan

Keywords: Corporate Social Responsibility, policymakers, regulation, The Gambia, Viable Practices, institutional capacity

Abstract

Introduction

Increasingly, Human Resource Management (HRM) treats sustainability as a strategic driver of organisational performance. Within this shift, Green Human Resource Management (GHRM) has emerged, integrating environmental considerations into core HR functions such as recruitment, training and development, performance management, and reward systems

Purpose, Aim and Objectives

Although GHRM is gaining global traction, its effectiveness remains uneven in developing economies and service-oriented sectors like hotels due to inconsistent application(Suleman et al., 2025). Existing research largely emphasises formal policies and structures, often overlooking the employee behaviours required for implementation. This highlights a gap between intended sustainability outcomes and actual performance. In five-star hotels, operating in environmentally sensitive coastal areas and facing growing international sustainability pressures, this gap highlights the need for a more grounded, context-sensitive investigation.

The study examines how GHRM practices influence hotel performance through employee attitudes and behaviours. It develops and validates a model linking green HR practices to performance outcomes. Specifically, it aims to: assess the extent of GHRM implementation in selected hotels, analyse its impact on employee attitudes, and evaluate how these attitudes translate into pro-environmental behaviours and, ultimately, organisational performance.

Literature Review and Theoretical Framework

The literature largely adopts an organisational perspective, focusing on GHRM policies, systems, and strategic intent (Suengkamolpisut et al., 2025). However, this macro-level focus is criticised for overlooking micro-level performance, specifically the attitudes and behaviours of employees who implement these policies (Ayyat and Abu Safieh, 2025). Without employee engagement, GHRM risks becoming symbolic, creating a gap between policy adoption and actual practice.

To address this, the study applies the Motivation–Ability–Role Perception (MARS) theory. that posits that performance depends on motivation, ability, and role clarity. In this context, green training can build ability, green rewards enhance motivation, and clear roles ensure role clarity. Integrating these elements enables assessment of how GHRM influences employee behaviour, bridging the gap between organisational intentions and actual outcomes.

Methodology and Methods

The study employs a mixed-methods approach to examine both measurable outcomes and the implementation of GHRM in Gambian five-star hotels (Mankgele, 2025). Quantitative data are collected through structured questionnaires and analysed using SEM–AMOS to test relationships among GHRM practices, employee outcomes, and organisational performance, ensuring rigor and generalisability (Al-Sabi et al., 2024). Complementing this, qualitative semi-structured interviews with HR managers and staff explore implementation challenges and contextual dynamics. While this triangulation enhances validity and depth, challenges remain in integrating datasets, balancing methods, and addressing contextual limits to generalisation. Overall, the approach provides a robust and comprehensive understanding of effectiveness in the Gambian hospitality sector.

Main Findings and Contribution

This research demonstrates that GHRM practices influence organisational performance indirectly through employee attitudes and behaviour, rather than at the organisational level. While green training contributes, its impact is limited without motivation and clear role expectations (Ayyat and Abu Safieh, 2025). Motivation is a key driver of pro-environmental behaviour, whereas role ambiguity can constrain effectiveness. The findings contribute empirical evidence that employee-level mechanisms mediate the GHRM–performance relationship. They also highlight the importance of contextual factors, such as resource constraints, workforce composition, and

institutional environments, in shaping the success of sustainability initiatives in developing economies.

Originality and Value

This study is distinctive in integrating behavioural theory with GHRM research, moving beyond the dominant policy-centred approach. Using Motivation–Ability–Role Perception (MARS) Theory, it explains how GHRM practices translate into performance through employee behaviour. Its focus on Gambian five-star hotels addresses a key empirical gap, as prior studies largely examine developed or major emerging economies. Additionally, the mixed-methods design enhances value by combining statistical rigor with contextual depth, offering practical insights into GHRM implementation.

Research Limitations

The study is limited by its focus on five-star hotels, minimizing generalisability to other hospitality segments and industries. Its cross-sectional design prevents causal inferences, and reliance on self-reported data introduces potential response bias, particularly regarding socially desirable environmental behaviours. Future research should adopt longitudinal designs, include more diverse organisational contexts, and use objective performance measures.

Theoretical and Practical Applications/Implications

The study advances theory by underscoring the micro-foundations of sustainability performance and validating the Motivation–Ability–Role Perception (MARS) framework in explaining the GHRM–organisational outcomes. It clarifies how organisational systems and employee behaviour interact to drive sustainability.

Practically, it offers actionable guidance for managers and policymakers, highlighting the need for an integrated GHRM approach that aligns training, rewards, and role clarity to boost engagement. It further emphasises embedding sustainability into daily practices through capacity building and institutional support. Overall, the study frames sustainability in hotel management as primarily a human and behavioural challenge, not merely a strategic or technological one.

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FORENSIC ACCOUNTING IN THE PUBLIC SECTOR: STRENGTHENING CONTROLS IN THE ITALIAN INSTITUTIONAL CONTEXT

Esposito, Paolo[1]; Tufo, Massimiliano[2]

[1]Department of Business and Economic Studies, University of Naples "Parthenope", Naples, Italy

[2]Department of Law, Economics, Management and Quantitative Methods, DEMM, University of Sannio, Benevento, Italy

Keywords: Forensic Accounting, Maladministration, Internal Control, Destructive Accountability.

Introduction

The integration of forensic accounting with internal and external control systems represents a critical condition for strengthening public sector governance and for addressing fraud, corruption and maladministration in the management of public resources. Within public administrations, traditional control mechanisms primarily ensure formal legality and procedural compliance, while often proving insufficient to detect complex or concealed forms of misconduct. In this context, forensic accounting emerges as a complementary and specialised approach, positioned at the intersection of accounting, law, investigative practice and data analytics, and oriented toward both preventive and reactive functions.

Purpose, Aim and Objectives

The purpose of this study is to examine the role of forensic accounting within public sector control systems, with specific reference to the Italian institutional context. The aim of the research is to clarify how forensic accounting, when conceived as a complementary and specialised practice, may contribute to strengthening public sector governance by enhancing the capacity of control mechanisms to identify, document and address maladministration. In line with this aim, the study pursues two objectives. The first is to identify institutional and regulatory settings in which forensic accounting can be effectively positioned. The second is to explore how key control actors may employ forensic accounting techniques.

Literature Review and Theoretical Framework

Forensic accounting operates at the intersection of accounting, law, and social sciences, with preventive and investigative purposes in detecting fraud and mismanagement (Honigsberg, 2020). It complements internal and external controls in public administration, which safeguard operational compliance and verify administrative appropriateness (Esposito & Ricci, 2019). While internal controls mitigate risks, external controls ensure public accountability (Cassese, 1992). Forensic accounting differs from ordinary audits in methods and traceability, requiring rigorous data preservation and adherence to procedural law (Koh et al., 2009; Abdulrahman, 2019). It identifies responsibilities in maladministration via detailed financial and accounting analysis (Dicorato et al., 2026).

Methodology and Methods

The study adopts a qualitative and conceptual research design grounded in doctrinal analysis of the Italian legal and institutional framework governing public sector controls. Legislative sources, regulatory provisions and formal mandates of control bodies are systematically examined in order to reconstruct the evolution of control functions and to identify areas of potential interaction with forensic accounting practices. The methodological approach is consistent with the exploratory nature of the study and with its focus on conceptual clarification rather than empirical testing.

Findings and Contribution

The analysis shows that the Italian public sector control system has progressively evolved from a model centred on preventive legality checks toward forms of oversight that emphasise collaboration, results and accountability. Within this framework, forensic accounting emerges as a specialised practice capable of enhancing the effectiveness of control activities, particularly in situations involving suspected maladministration and potential administrative, accounting or criminal liability. The study highlights that several control actors, including boards of auditors, the State General Accounting Department and its inspection services, and the Court of Auditors, operate within institutional settings that may accommodate forensic accounting approaches, especially through the systematic examination of accounting data and financial documentation.

Originality and Value

The originality of the study lies in its integrated analysis of forensic accounting and public control systems, with a specific focus on the Italian institutional context. Rather than presenting forensic accounting as a self-sufficient solution, the paper positions it as a complementary practice whose effectiveness depends on its alignment with existing control architectures, legal standards and professional roles. The study avoids overstating causal claims and offers an analytical framework that may inform future empirical research.

Research limitations

The research is subject to limitations inherent in conceptual and normative analysis. It does not include empirical testing of the effectiveness of forensic accounting practices, nor does it provide quantitative evidence on fraud reduction or deterrence effects. In addition, the focus on the Italian public sector may limit the transferability of the findings to other institutional settings.

Theoretical and Practical Implications

From a theoretical perspective, the study contributes to public sector accounting research by clarifying the positioning of forensic accounting within control and governance frameworks. From a practical perspective, it suggests that the adoption of forensic accounting techniques, supported by appropriate professional competencies and evidentiary standards, may strengthen the capacity of control bodies to detect and document maladministration. These insights may inform policy design, professional training programmes and future research on the integration of forensic analytics into public financial oversight.

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ACCRUAL ACCOUNTING REFORM IN ITALY AS A COLLABORATIVE GOVERNANCE PROCESS

Esposito, Paolo[1]; Tufo, Massimiliano[2]

[1]Department of Business and Economic Studies, University of Naples "Parthenope", Naples, Italy

[2]Department of Law, Economics, Management and Quantitative Methods, DEMM, University of Sannio, Benevento, Italy

Keywords: Collaborative governance, accrual accounting, public financial management, Italy, institutional reform.

Abstract

Over the past three decades, public financial management has increasingly shifted from cash-based systems to accrual accounting, aiming to enhance transparency, efficiency, and accountability. While technical rationales for accrual reform are well documented, the governance mechanisms enabling successful implementation remain underexplored. This study conceptualizes accrual accounting reform in Italy as a case of collaborative governance, examining how interdependent actors coordinate across organizational and institutional boundaries to design, implement, and adapt a unified accrual-based accounting system. Using a qualitative, single-case approach with process-tracing, the analysis draws on legislative documents, organizational manuals, public consultation records, and secondary literature. Findings demonstrate that effective reform relies on structured governance mechanisms, boundary-spanning expertise, inclusive consultation, and formalized due processes that institutionalize trust, reduce coordination costs, and foster adaptive learning. The study contributes to collaborative governance theory by highlighting its application in technically complex public sector reforms and offers policy insights for other countries implementing accrual accounting systems.

Introduction

The global transition from cash-based or commitment-based accounting to accrual accounting has been one of the most far-reaching transformations in public financial management over the past three decades. Emerging within the broader New Public

Management (NPM) movement, accrual accounting has been promoted as a mechanism to enhance transparency, efficiency, and accountability by adopting private-sector-inspired practices (Christiaens et al., 2015; Lapsley et al., 2009). By recognizing revenues and expenses when they are earned or incurred, accrual systems are expected to provide a more comprehensive understanding of service costs, asset and liability management, and long-term fiscal sustainability (Christensen et al., 2019).

Internationally, this reform trajectory has been supported by the International Public Sector Accounting Standards Board (IPSASB) through the development of IPSAS (IFAC, 2018), as well as by European harmonization initiatives such as the proposed European Public Sector Accounting Standards (EPSAS) (Brusca & Martínez, 2016; Cohen et al., 2023). Yet, despite the technical sophistication of these frameworks, empirical research consistently demonstrates that accrual accounting reform is neither linear nor purely technical. Institutional capacity constraints, political incentives, and administrative culture significantly shape reform outcomes (McLeod & Harun, 2014). In several contexts, reforms have resulted in "decoupling," whereby formal adoption of accrual standards does not translate into their substantive use (Antipova & Bourmistrov, 2013). Even in advanced systems, complexity and political incentives may undermine the expected benefits of accrual principles (Cohen et al., 2019; Falkman & Tagesson, 2008).

Recent scholarship has therefore emphasized that accrual accounting reform must be understood as an institutional learning process embedded within national administrative traditions and accountability frameworks (D'Amore et al., 2023). However, while the literature acknowledges the institutional embeddedness of reform, it has devoted limited attention to the governance architectures through which accrual reforms are designed, negotiated, and implemented.

In parallel, collaborative governance theory has developed a rich analytical framework to explain how interdependent actors coordinate across institutional boundaries to achieve collective goals that exceed the capacity of any single organization (Ansell & Gash, 2008). The concept of a collaborative governance regime highlights how political environments, institutional arrangements, and governmental actions structure collaborative processes and outcomes (Emerson & Nabatchi, 2015; Hajnal & Jeziorska, 2021). Research in network governance has further examined how coordination forms and managerial strategies shape collaboration effectiveness (Provan & Kenis, 2008; Torfing et al., 2012; Klijn et al., 2025). Trust and repeated interaction reduce coordination costs in complex governance settings (Kossinets & Watts, 2006), and the combination of internal cohesion with external

exploration fosters adaptive and inclusive collaborative arrangements (Ertug et al., 2022).

Despite these theoretical advances, collaborative governance has rarely been applied to the domain of public financial management reform. Accrual accounting reforms have largely been examined through technical, managerial, or institutional lenses, but seldom as structured collaborative governance processes.

The research addresses the following question: *How can collaborative governance facilitate the design and implementation of accrual accounting reform, and how is collaboration structured and institutionalized within such processes?*

The aim of this study is to conceptualize accrual accounting reform as a collaborative governance regime and to empirically examine how such a regime is constructed and institutionalized in the Italian case under the National Recovery and Resilience Plan (PNRR). By bridging collaborative governance theory and accrual reform scholarship, the paper reframes accounting standard-setting and implementation as a governance architecture problem involving interdependence management, institutional scaffolding, and adaptation to national administrative contexts (Almond & Verba, 1963; Emerson & Nabatchi, 2015; Klindt et al., 2024).

Through an in-depth analysis of the Italian governance structure for accrual reform, this study contributes to extending collaborative governance theory into the field of public financial management and to enriching the accrual reform literature by demonstrating that reform effectiveness depends not only on technical standards but on how collaboration is formally organized, stabilized, and embedded within a broader governance regime.

The structure of this paper is as follows: Section 2 provides the theoretical background; Section 3 details the methodology employed; Section 4 presents the empirical results; and Section 5 concludes with a discussion and implications.

Literature Review

Collaborative governance theory conceptualizes policymaking and institutional change as processes that bring together actors from the public, private, and civil society sectors in consensus-oriented decision-making arrangements aimed at achieving goals beyond the capacity of any single organization (Ansell & Gash, 2008). At its core, collaborative governance rests on interdependence, cross-sector collaboration, and coordinated action among heterogeneous actors.

Rather than focusing solely on individual collaborative processes, Emerson and Nabatchi

(2015) introduce the concept of a collaborative governance regime, defined as the broader system of public decision-making in which collaborative dynamics are embedded. This regime encompasses institutional rules, policy environments, and governmental actions that shape the conditions for collaboration. As Hajnal and Jeziorska (2021) argue, institutions and practices constituting a government's stance toward collaboration tend to stabilize over time and crystallize into identifiable regime types. Thus, collaboration is not episodic but structurally embedded within institutional configurations.

A crucial dimension of such regimes concerns civic culture, understood as citizens' values and predispositions regarding active participation, trust in political institutions, civic responsibility, and the willingness to defer to authority when appropriate (Almond & Verba, 1963). Civic culture shapes the legitimacy and functionality of collaborative arrangements, influencing both participation patterns and trust dynamics. Trust, in particular, reduces coordination costs and facilitates cooperation in complex governance settings (Kossinets & Watts, 2006).

Research in network governance further refines this perspective by analyzing the structural forms, enabling conditions, and barriers of collaboration, as well as the managerial strategies required to organize interorganizational networks (Provan & Kenis, 2008; Ansell & Gash, 2008; Torfing et al., 2012; Klijn et al., 2025). Governance effectiveness depends not only on network design but also on the capacity to balance autonomy and coordination. Provan and Kenis (2008) distinguish among different network governance models, including lead-organization forms in which a central actor coordinates collective action. Klindt et al. (2024) emphasize that understanding collaborative governance requires examining the dynamic interplay between everyday collaborative practices and the organizational, institutional, and technological scaffolding that supports them. These configurations shape not only collaboration itself but also its implications for public value creation.

Collaborative governance has proven particularly relevant in contexts characterized by high complexity and technological interdependence, such as urban smartification (Lee & Ospina, 2022) and climate governance (Bodin, 2017). In such domains, effective governance requires combining internal cohesion with external exploration, enabling actors to cultivate adaptive and inclusive collaborative arrangements (Ertug et al., 2022). This balance between stability and openness is critical when institutional innovation must occur under conditions of uncertainty.

The literature on accrual accounting reform exhibits striking parallels with these insights. The global shift toward accrual accounting, promoted within the New Public Management

paradigm, has been framed as a means to enhance transparency, efficiency, and accountability (Christiaens et al., 2015; Lapsley et al., 2009). By recording revenues and expenses when they are earned or incurred, accrual systems promise a more comprehensive understanding of service costs, asset and liability management, and long-term fiscal sustainability (Christensen et al., 2019). International standard-setters such as IPSASB and European initiatives such as EPSAS have sought to provide harmonized technical frameworks (IFAC, 2018; Cohen et al., 2023; Brusca & Martínez, 2016).

Yet empirical evidence demonstrates that accrual reform is not merely a technical exercise. Its success depends on institutional capacity, political support, and administrative culture (McLeod & Harun, 2014). In several countries, formal adoption has not translated into substantive use, leading to forms of "decoupling" between official standards and actual practices (Antipova & Bourmistrov, 2013). Even in advanced contexts, smaller entities struggle with the complexity of accrual reporting (Falkman & Tagesson, 2008), and political incentives may foster earnings management despite the introduction of accrual principles (Cohen et al., 2019).

Recent scholarship stresses that accrual systems cannot simply replicate private-sector models but must be adapted to national administrative traditions and accountability frameworks (D'Amore et al., 2023). In this sense, accrual reform represents an institutional learning process that reshapes how governments conceive financial responsibility.

Methodology

This study adopts a qualitative, single-case design to investigate how collaborative governance operates in the context of accrual accounting reform in Italy. The Italian case provides a critical, theory-driven opportunity to examine the mechanisms through which governance structures, interdependent actors, and formalized processes shape reform outcomes (Yin, 2018). By focusing on a single, analytically significant case, the research prioritizes an understanding of the dynamics of collaboration, boundary spanning, and institutional scaffolding, rather than seeking statistical generalization.

The study follows a theory-driven process-tracing approach, allowing the identification of causal mechanisms linking collaborative governance structures to reform implementation outcomes (George & Bennett, 2005). It traces the design and operationalization of Italy's governance architecture under the National Recovery and Resilience Plan (PNRR), emphasizing how each organizational body contributes to the collective goal of establishing a

unified accrual accounting system.

Data sources include legislative and regulatory documents such as Decreto-Legge 6/11/2021, n. 152 (Art. 9) and the RGS Determina n. 35518/2020 with its subsequent modifications, which define the institutional framework for the reform. Organizational documents and manuals produced by the RGS, the Standard Setter Board, and the Secretariat provide detailed descriptions of roles, processes, and the formal due process for standard-setting. Secondary literature on accrual reform and collaborative governance offers theoretical and comparative context, drawing on works such as Ansell and Gash (2008), Emerson and Nabatchi (2015), Christensen et al. (2019), and Klindt et al. (2024). Additionally, public consultation records and official reports illustrate stakeholder engagement during the due process phase, including contributions from ministries, oversight bodies, universities, and statistical agencies.

The analytical approach integrates structural mapping, theoretical coding, and pattern identification. Structural mapping identifies and classifies governance actors, including the Steering Committee, Standard Setter Board, Advisory Group, and Secretariat, along with their formal roles and responsibilities. Theoretical coding links each governance element to collaborative governance concepts such as boundary spanning, interdependence management, trust-building, and adaptive learning (Ansell & Gash, 2008; Bartels, 2018; Ertug et al., 2022). Pattern identification examines how interactions among actors, formalized procedures, and consultative mechanisms produce collective outcomes and mitigate risks of decoupling (Antipova & Bourmistrov, 2013; Emerson & Nabatchi, 2015).

Italy provides a particularly relevant context because accrual reform is embedded within the PNRR, a high-stakes policy framework with strong political and financial accountability pressures. The reform involves multiple ministries, standard-setting bodies, and external stakeholders, creating high interdependence and complex boundary-spanning requirements. Furthermore, Italian administrative traditions and capacity constraints offer a rich empirical setting to examine how collaborative governance can mediate between international accounting standards (IPSAS and prospective EPSAS) and national implementation realities (D'Amore et al., 2023; Christensen et al., 2019). This methodology ensures that both formal structures and collaborative practices are captured, linking descriptive evidence to broader theoretical claims about governance, coordination, and reform implementation.

Findings and Discussion

The implementation of accrual accounting reform in Italy provides a compelling example of

a structured, collaborative governance regime, in which interdependent actors coordinate to achieve the collective goal of a unified, accrual-based accounting system for public administrations (Ansell & Gash, 2008; Emerson & Nabatchi, 2015). The governance architecture, formally established under the National Recovery and Resilience Plan (PNRR) and institutionalized via the Ragioneria Generale dello Stato (RGS) through Determina n. 35518/2020 and subsequent modifications, demonstrates how collaborative governance principles are operationalized in a technical yet inclusive public financial management reform.

Central Coordination: The Steering Committee

At the core of the governance regime is the *Comitato Direttivo* (Steering Committee), presided over by the RGS. Its primary function is to provide initiative, strategic guidance, and formal approval of all accrual accounting standards developed by the technical board. In collaborative governance terms, the Steering Committee functions as the central coordinating authority, ensuring internal cohesion and aligning technical outputs with political and administrative priorities (Emerson & Nabatchi, 2015; Hajnal & Jeziorska, 2021). By consolidating decision-making authority, the Committee reduces the risk of fragmented implementation and ensures that outputs from technical and consultative bodies are coherent and actionable.

Technical Expertise: The Standard Setter Board

The Standard Setter Board (SSB) is a 15-member independent technical commission responsible for developing accrual-based standards (ITAS and QC) according to international IPSAS guidelines and prospective EPSAS principles. The SSB embodies functions (Bartels, 2018; Klindt et al., 2024), linking domestic administrative knowledge with international standards and technical expertise. Operating without mandates tied to specific constituencies, the SSB fosters trust, impartiality, and deliberative rigor. Its technical independence allows for iterative exploration of standard designs while maintaining alignment with overarching strategic goals set by the Steering Committee.

Consultation and Inclusiveness: The Advisory Group

Complementing the central and technical bodies is the Gruppo di Consultazione (Advisory Group), which facilitates external engagement and legitimacy. This group brings together stakeholders from oversight bodies (e.g., Corte dei Conti), statistical agencies (Istat), universities, and relevant ministries. By institutionalizing structured consultation, the regime embodies inclusive collaborative practices that allow external knowledge to shape standards, anticipate implementation challenges, and adapt principles to the Italian administrative

context (Ertug et al., 2022; Almond & Verba, 1963). This mechanism also operationalizes the formal due process, providing iterative opportunities for feedback before standards are finalized and published, thereby mitigating decoupling risks (Antipova & Bourmistrov, 2013).

The Due Process: Formalized Collaboration and Institutional Learning

The governance architecture institutionalizes a formalized due process for standard creation and revision, mirroring practices in European EPSAS development. This process incorporates multiple stages: technical elaboration by the SSB, strategic review by the Steering Committee, external consultation, publication by RGS, and eventual legislative adoption. The process exemplifies structured collaboration, where repeated interaction, transparency, and formalized procedures reduce coordination costs and foster adaptive learning across institutional and professional boundaries (Emerson & Nabatchi, 2015; Kossinets & Watts, 2006; Ertug et al., 2022). Over time, this structure is expected to facilitate both internal cohesion (alignment of technical and political actors) and external exploration (incorporation of broader expertise), key conditions for effective collaborative governance (Ertug et al., 2022).

Conclusion

This study demonstrates that accrual accounting reform in Italy can be conceptualized as a collaborative governance regime, where reform outcomes are shaped not merely by technical standards but by the structured interactions of interdependent actors across institutional boundaries. The Italian case under the PNRR illustrates how governance structures, formal processes, and consultative mechanisms collectively facilitate the design, implementation, and adaptation of accrual-based accounting principles.

The analysis advances collaborative governance theory by extending its application to public financial management reform, showing that interdependence among ministries, standard-setting bodies, oversight agencies, and external experts is critical in technically complex reforms (Ansell & Gash, 2008; Bodin, 2017; Lee & Ospina, 2022). The study highlights how institutional design shapes collaborative processes: the Steering Committee ensures internal cohesion, the Standard Setter Board performs technical boundary-spanning, the Advisory Group integrates external expertise, and the Secretariat operationalizes decisions. These elements exemplify the logic of combining internal alignment with external exploration to foster adaptive, resilient reform (Ertug et al., 2022; Emerson & Nabatchi, 2015). Formalized

due processes institutionalize trust, reduce coordination costs, and embed adaptive learning mechanisms, mitigating the risks of decoupling identified in prior accrual reform research (Antipova & Bourmistrov, 2013; Kossinets & Watts, 2006).

From a policy perspective, the Italian governance model provides insights for other countries implementing accrual reforms. Establishing formal governance structures, embedding boundary-spanning expertise, and institutionalizing due processes are critical for reducing implementation gaps, ensuring legitimacy, and fostering adaptive learning. Reform is as much a governance problem as a technical problem, requiring sustained coordination, consultation, and iterative refinement.

Future research could examine how collaborative governance regimes for accrual reform evolve over time, particularly in response to political changes or administrative shocks. Comparative studies across countries adopting IPSAS or EPSAS principles would further elucidate how institutional contexts mediate the effectiveness of collaborative governance in financial management reforms.

In conclusion, accrual accounting reform in Italy illustrates that collaborative governance is not an ancillary feature but a core mechanism for successful public financial reform. By conceptualizing reform as a collaborative governance regime, this study contributes to both theory and practice, demonstrating that the architecture of collaboration (its structures, processes, and boundary-spanning mechanisms) is central to achieving meaningful and sustainable institutional change in the public sector.

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SOCIAL ECONOMY ORGANIZATIONS IN THE FIELD OF SOCIAL WORK AS DRIVERS FOR A SUSTAINABLE SOCIETY: RESULTS OF AN EXPLORATIVE STUDY ON POTENTIALS, CHALLENGES AND OPPORTUNITIES IN AUSTRIA

Anastasiadis, Maria

Department of Educational Science, University of Graz, Austria

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Abstract

This paper focuses on social economy organizations in the field of social work. It examines on both theoretical and empirical basis, the extent to which these organizations, particularly those engaged in the areas of poverty reduction and inclusion, can contribute to creating a more sustainable society. Due to their organizational characteristics and their intermediary position between the state, the market and the neighborhood or family economy, which features a broad stakeholder involvement (cf. Evers & Olk, 1996), it can be assumed that they can shape society and thus also support the achievement of core Sustainable Development Goals (SDGs) as defined by the United Nations in Agenda 2030 (cf. Anastasiadis, 2024).

In international discourses, there have been discussions to what extent and in what form the climate crisis with their ecological and social effects also affects the profession of social work (e.g. Dominelli, 2012). Under the keywords of climate justice, sustainable or green social work, corresponding topics are now also being discussed in the German-speaking world (e.g. Pfaff et al., 2022, Liedholz, 2021). But a look at recent history shows that these organizations have already been making social, ecological and alternative-economic contributions for decades - albeit largely unrecognized. Core references for this can be found in their relation to the human rights, in their working principles and methods, in the range of social and other services they provide and in their organizational structures as social economy organizations (cf. Anastasiadis, 2024).

Thus, social work refers in its professional self-understanding to the human rights (cf. IFSW, 1992), which also forms the foundation of the Agenda 2030 (cf. United Nations, 2015). Fundamental working principles of social work, such as participation, lifeworld and resource orientation, reflect the attitudes and methods promoted in sustainability discourses, as defined,

for example, in Agenda 21 (cf. United Nations, 1992). Their primary social goal supports the achievement of key SDGs (e.g., no poverty, gender equity). Beyond this, these organizations promote sustainable consumption and production. In this respect, reuse enterprises, social markets, urban gardening and green care projects are to be mentioned (cf. Anastasiadis, 2024). These examples, briefly listed here, illustrate the relevance of these organizations for a sustainable society. The broad stratification of the SDGs and their increased public awareness offer opportunities for them not only to position themselves more strongly within the social pillar, but also to make their economic, ecological and participatory contributions visible in sustainability discourses.

Following on from this, this paper, which refers to a work-in-progress research project, explores the contribution of social economy organizations in the field of social work to achieving the SDGs by means of innovative, sustainability-oriented methods and concepts. After a theoretical explanation of the relationship between sustainable development, social economy organizations and social work, results of an explorative study conducted in Austria are presented in a descriptive-analytical manner. This highlights their potential but also challenges and future opportunities. The dataset, generated between 2021 and 2025, is based on a criteria-driven mapping of social work organizations in selected action fields (e.g. labor market, poverty, health, community work, youth work). 65 organizations were portrayed along their key characteristics (primary social objective, alternative economic approaches, ecological aspects, participatory organizational culture). In a second step, 35 in-depth expert interviews were conducted with selected representatives of these 65 organizations. They were analyzed using a qualitative content analysis, that has not yet been completed.

Therefore the data presented in this paper, refer only to specific examples of organizations, which operate in the areas of poverty reduction and inclusion. The dataset is based on seven interviews (four in the field of poverty reduction and three in the field of inclusion). Therefore, only preliminary trends can be derived from it. Furthermore, the findings cannot be generalized to all organizations in these areas.

The first results indicate that the organizations surveyed are making contributions to relevant SDGs (e.g., No Poverty, No Hunger, Health and Well-Being, Decent Work, Sustainable Consumption and Production, Partnership to achieve the Goals). However, this is also associated with challenges from which future development opportunities can be derived (e.g. sustainable financing structures, reducing bureaucratic barriers, fostering public transport in rural areas), which are discussed afterwards. The last part of the paper addresses the positioning

of social economy organizations in the field of social work in sustainability discourses. Even if the debate on sustainable development in social work has intensified in recent years, there is still room for improvement. Against this background, this paper should also be read as piece of inspiration continuing discussions and further research.

Introduction

This paper, which refers to a work-in-progress research project, focuses on social economy organizations in the field of social work, hereinafter also referred to as social work organizations. Due to their organizational characteristics - priority of a social goal, non-profit-maximizing and democratic structure (see European Commission, 2021) - and their intermediary position between the state, the market and the neighborhood or family economy, which features a broad stakeholder involvement (cf. Evers & Olk, 1996), it can be assumed that they have the potential to shape society. They open spaces for social innovation (cf. Mulgan, 2007). This is particularly relevant in times of climate crisis-related social change. In the course of sustainability-oriented social work, recently ecological aspects are increasingly becoming a central topic in research and practice (e.g., Dominelli, 2012, Pfaff et al,. 2022, Liedholz, 2021). But a look at recent history shows that social economy organizations in the field of social work have already been making social, ecological and alternative economic contributions for decades - albeit largely unrecognized - and thus contributing to the SDGs as defined by the United Nations in Agenda 2030 (cf. Anastasiadis, 2024). Worth mentioning are the developments of Jane Addams at Hull House - a solidarity-based economic housing and living project with ecological effects (cf. Elsen, 2023a), work integration social enterprises, that emerged in the 1980s, many of which are active in ecological business areas (cf. Anastasiadis, 2019; 2023) and current developments in the field of social farming (cf. van Elsen, 2018).

Thus, this paper explores the contribution of these specific organizations to achieving the SDGs by means of innovative, sustainability-oriented methods and concepts. It is based on theoretical concepts and on an explorative study conducted in Austria, which makes their potential empirically visible, but which also asks about challenges and future opportunities. Specifically, the research focuses on the following questions: 1) In which way are social work organizations already contributing to sustainable development and the SDGs? 2) What challenges and opportunities are associated with this? 3) How can the sustainability potential of these organizations be harnessed and promoted in a more targeted manner in the future?

In the first part of the paper, the two central terms “sustainable development” and “social economy organizations in the field of social work” are specified on a theoretical level. On this

basis, conceptual links between them will be explored, from which the thesis can be derived that these organizations make, or can make, important contributions to the realization of a sustainable society. Finally, the identified elements of the theoretical framework are integrated into an analytical model that serves as a lens for the empirical study. The second part briefly outlines the research design of the empirical study, which is based on a criteria-based survey of organizations in selected fields of action and on guided interviews with experts from these organizations. In the third part, first results are presented, from which initial trends can be identified. Since the data analysis is not yet completed, the presentation of the results focuses on specific examples of organizations, which operate in the areas of poverty reduction and inclusion. Their performance is analyzed along the core dimensions of the analytical model in a mainly descriptive-analytical manner. After this, selected challenges and future opportunities will be summarized. The last part of the paper concludes the identified tendencies and addresses the positioning of social economy organizations in the field of social work in sustainability discourses. This should also serve as a stimulus for follow-up discussions and research.

Conceptual Framing: Sustainable Development and Social Economy Organizations in the field of Social Work

The idea of a sustainable society has become a central theme of international politics in recent decades. The shortage of natural resources combined with growing social inequality and economic instability bear conflicts that cannot be managed by the nation state and thus force a global model (cf. Kuhn & Heinrichs, 2011). Such a global model was first articulated in the Brundtland Report of 1987. Since then, we define sustainable development as, “a development which meets the needs of the present generation without compromising the ability of future generations to meet their own needs“ (WCED, 1987, 43).

From the outset, sustainable development has focused on the environmental, social and economic dimensions. It calls for environmentally sound economic growth as well as intra- and intergenerational social equity (cf. Elkington, 1997). In approaching this, it is essential to address all three dimensions simultaneously and in an intertwined manner. This is particularly emphasized in the Agenda 2030 and the 17 SDGs defined therein (cf. United Nations, 2015).

The SDGs focus less on dimensions and more on cross-cutting issues such as 'no poverty', 'decent work and economic growth' or 'sustainable consumption and production'. Furthermore, the implementation of sustainable development requires specific approaches characterized by participation and cooperation (cf. Newig/Kuhn/Heinrichs, 2011), which is explicitly

emphasized for the first time in SDG 17 'Partnership to achieve the goals'. This underlines the need to involve all social groups in planning, decision-making and implementation processes for sustainable development, which in turn requires political or other forms of management that are discussed under the heading of “governance” (cf. Kuhn & Heinrichs, 2011, 19). Such participatively developed solutions are particularly important with regard to balancing trade-offs (cf. Anastasiadis, 2019). According to Liedholz and Verch (2023, 12), social work organizations can make a significant contribution to promoting a sustainable society, particularly in this context. They are “called upon to engage in this debate and to support as many people as possible in an ‘advocacy’ way (...) to participate in information, design, and decision-making processes (...) relating to sustainability.”

It is probably the broad categorization of the SDGs and their increased public awareness that can be seen as a trigger for the profession and discipline of social work to increasingly address, discuss and make visible its contributions to sustainable development and the SDGs.

In international discourses, there have been discussions to what extent and in what form the climate crisis with their ecological and social effects also affects the profession of social work (e.g. Dominelli, 2012). Under the keywords of climate justice, sustainable or green social work, corresponding topics are now also being discussed in the German-speaking world (e.g. Pfaff et al., 2022, Liedholz, 2021), whereby a particular focus is set on the potential of social economy organizations (cf. Elsen, 2023b).

In the following, conceptual links between social work and sustainable development are explored. At the same time, the understanding of social work organizations as part of the social economy is explained in detail. Overall, four central intersections can be identified at theoretical level. They refer to human rights, working principles and methods, the range of services and the specific organizational structure (cf. Anastasiadis, 2023, 260-261). Further they can be integrated into the four dimensions of sustainable development: the social, ecological, economic and participatory orientation, as outlined in the analytical-model at the end of this section in table 1.

Regarding human rights, it should be emphasized that social work refers to them in its professional self-understanding:

> “Social Work has, from its conception, been a human rights profession, having as its basic tenet the intrinsic value of every human being and as one of its main aims the

> promotion of equitable social structures, which can offer people security and development while upholding their dignity" (IFSW, 2010, 11).

Furthermore, the realization of human rights also forms the basis of Agenda 2030: The SDGs "seek to realize the human rights of all" (United Nations, 2015, 1).

Concerning the working principles of social work, such as lifeworld, social space and resource orientation, empowerment and participation (cf. Heimgartner, 2009), they are also reflected in the attitudes and methods outlined in the sustainability discourse already in the Agenda 21 (cf. United Nations, 1992).

Given the range of services - from child and youth work, youth welfare, family work, care of the elderly, support in cases of unemployment and poverty, or physical and mental illness, to community work (cf. Heimgartner, 2009) - social work supports the achievement of key SDGs - e.g. no poverty, no hunger, health and well-being, reduced inequalities - but also sustainable consumption and production, as we experience in re-use shops or social farming. And it also promotes sustainable cities and communities in community work settings. Further they are implementing internal measures to reduce environmental risks (cf. Anastasiadis, 2024). These and other examples illustrate the relevance of social work for a sustainable society.

In addition, their organizational structure reveals further potential for sustainability. Many of them operate as social economy organizations in the economic field between the market, the state and civil society - either as cooperatives, NPOs, social enterprises or social businesses. They are economically active organizations with employees. They have a primary social purpose and a participatory culture (cf. European Commission, 2021). Their primary social purpose is reflected in the social services they provide. In terms of economic performance, it should be emphasised that they are generally financed from a mix of sources - i.e. their own income, grants, donations, etc. - and they do not operate on a profit-maximizing basis. This means that profits are reinvested in the organisation to achieve social goals. In terms of organizational culture, they generally rely on participatory forms of organization in which different stakeholders are involved with a voice, as it is common for example in associations, but also in public-benefit liability companies and cooperatives. They also tend to have needs-based reasons for setting up their businesses and they collaborate with various partners (ibid.).

These organizational characteristics show that these social work organizations have socio-ecological potential, but they also open up alternative economic and participation-oriented opportunities to support the development of sustainable businesses and a sustainable society in

a wider sense. This theoretically derived thesis forms the starting point for an explorative study that aims to empirically reveal the sustainability potential of social work organizations, particularly those operating in the social economy segment, and to identify challenges and future opportunities.

The following table 1 illustrates how the theoretically identified dimensions and categories are integrated into an analytical model that serves as a lens for the empirical study.

Analytical Model				
Dimension	Social	Economic	Ecological	Participatory
Category	Primary social objective – relation to human rights	Non-profit maximizing	Aim to reduce environmental risks via …	Organizational form
	Kind of social services	Financial structure	a) Ecological business areas	Needs-based founding motive
	Target group	Employment structure	b) Internal measures	Collaborations, Member of Networks
	Working principles and methods	Contribution/Relation to the regional economy		Internal participation of employees and clients
	← Synergies and Trade-Offs →			
	↓			
	Future opportunities			

Table 1: Analytical Model

Empirical Basis: Research Design

For the research purpose, a multi-level research project was initiated. It was part of a research-teaching project that started in March 2021 and was finalized in June 2025. In a first step, a criteria-based survey of organizations in selected fields of action was carried out. An internet search was used to identify organizations and to describe their social, economic, environmental and participatory contributions. The fields of action were chosen according to the interests of the students involved and were the following: Labour market integration, poverty reduction, health and wellbeing, community work, youth work, child and youth welfare, crime and inclusion. A total of 65 organizations were collected – a random sample - and portrait alongside the core dimensions and categories outlined in the analytical model (table 1), to the extent that the organizations' Internet performance allowed it. This dataset formed the basis for the second phase of the research, in which in-depth guided interviews were conducted with representatives

of these 65 organizations. A total of 35 representatives from the 65 organizations were able to be recruited for interviews. The organizations are mainly based in the city of Graz. They were asked in detail about their social, economic, ecological and participatory performance, but also about challenges, chances and future opportunities. Both the interview guide and the coding guide are based on the dimensions and categories of the analytical model (table 1). The interviews were analysed using content analysis (e.g. Mayring, 2010) supported by MAXQDA software. Following an initial descriptive analysis, which is not yet completed, the next step is to develop a typology that identifies similarities and differences between organizations and across their areas of activity.

In the following first findings are presented, focusing on organizations operating in the areas of poverty reduction and inclusion. The dataset is based on seven interviews (four in the field of poverty reduction and three in the field of inclusion). Therefore, only preliminary trends can be derived from it. Furthermore, the findings cannot be generalized to all organizations in these fields.

Selected Results and Trends

First, it should be noted that the organizations surveyed are familiar with the multidimensionality and complexity of sustainable development and strive to align their actions accordingly. This is illustrated by the following quote:

> "The concept of sustainability is complex. For me, sustainability means using existing resources efficiently and effectively, relying on renewable resources, and, of course, reducing our ecological footprint as much as possible in light of climate change. Sustainability has several dimensions, not just ecological and economic ones. For me, sustainability simply means managing and using resources in such a way that the company is viable in the long term, jobs are secure, the quality of service is high, and we meet the needs of our clients in what we do, yes." (AN Z367-374).

In the following the detailed performance of the selected seven organizations is portrayed in a descriptive manner along the categories: social, economic, ecological, and participatory-institutional dimension.

Social dimension

Regarding the social dimension, all seven organizations surveyed have a primary social objective, which is not surprising given that they are social economy organizations acting in the

field of social work. The three organizations surveyed in the field of inclusion aim to support people with disabilities in all areas of life to enable them to lead a self-determined life in accordance with human rights. The aim is to draw on their potential and resources, to be a voice for their concerns and thus to enable equal opportunities for all. The target group is diverse. It includes people with disabilities of all ages and varying degrees of severity, as well as their caregiving relatives. Their social services include early-childhood intervention, mobile services in the areas of leisure, housing, family relief, residential services such as full-time and part-time assisted living, employment projects, day workshops, and school assistance. Methodologically, they are oriented toward individual possibilities and potential. The approaches of life-world and resource orientation as well as participation and empowerment are central to this.

The goals of the four organizations working in the field of poverty prevention are to combat homelessness, ensure financial security for families, guarantee food supplies, promote social cohesion in society, and reduce inequalities. Here, too, the target group is broad. It consists of socially disadvantaged people in precarious situations. Many of them are confronted with complex problems, for example in connection with migration, limited educational opportunities, or addiction. The range of social services offered extends from shelters and housing provision to clothing and food distribution, social markets, and second-hand shops to labor market integration projects. This is supplemented by low-threshold healthcare, counseling, financial support, and international disaster relief. Methodologically, the focus is on empowerment, resource orientation, individual needs-based support, and low thresholds, similar as in the area of inclusion.

Overall, these initial findings reveal a strong connection to the criteria of the social economy on the one hand and to the SDGs on the other. They are closely linked to human rights in the provision and delivery of their services, and they contribute to key SDGs, particularly those related to social issues.

Economic dimension

In terms of their economic approach, all seven organizations surveyed operate on a non-profit basis or do not seek to maximize profits, with differences in financing structures particularly among organizations working in the field of poverty prevention. Two organizations in this field finance themselves through a mix of subsidies, donations, and self-generated income, the latter resulting from sales in second-hand stores and social markets. The generated income is reinvested in infrastructure and social projects. On the other hand, the remaining two

organizations are financed primarily through donations from private individuals and regional companies.

In the field of inclusion, funding is regulated consistently through service agreements with the Province of Styria and the Social Ministry Service based on daily rates in accordance with the Styrian Disability Act, whereby all three organizations also receive additional subsidies and donations. Here, also, all three organizations generate their own income through revenue from sheltered workshops and employment projects, which is also reinvested in social projects.

All seven organizations employ paid staff, which can be interpreted as an expression of economic activity, although the number varies depending on the size of the organization, and the field of poverty prevention tends to have more volunteers. In addition, all organizations cooperate with the regional economy and see themselves as a regional economic factor and an important employer.

These initial insights point to alternative economic approaches that are characteristic for the social economy. However, the fact that they are funded through various sources also makes them dependent on those sources, which can be challenging, as it will be discussed later in this paper.

Ecological dimension

The data shows that all seven organizations surveyed are implementing measures to reduce environmental risks, whereby three organizations in the field of poverty prevention are explicitly serving ecological business areas in addition to internal activities. They contribute to the circular economy by recycling food, clothing, furniture, and electrical appliances in second-hand stores, social markets, and food banks.

Internally, all seven organizations implement measures for resource-efficient management and awareness raising, e.g., through waste prevention, solar power, internal sharing platforms, carpooling, incentives for using public transportation and bicycles, training in workshops, and projects with target groups (e.g., Environment Week). It is interesting to note that activities in the field of inclusion are strategically anchored in the mission statements of the three organizations surveyed and are supported by sustainability officers and reports. In this respect, resource-efficient management tends to be more developed here, whereas the business areas are not explicitly ecologically oriented in the questioned organizations. This may indicate that these organizations have a more hierarchical structure and a higher degree of professionalization than

organizations in the field of poverty prevention. Another indication of this could be that the latter ones have a higher number of volunteers, as noted under the economic dimension.

Participatory-Institutional dimension

As social economy organizations, all seven organizations surveyed have participatory and cooperative organizational structures. All of them operate as public-benefit organizations, with associations predominating in the field of poverty prevention. In the area of inclusion, however, all three are structured as public-benefit limited liability companies, with an association acting as a shareholder. In the interviews, all organizations refer to a needs-based founding motive and to diverse collaborations with other specialized institutions and authorities to ensure the provision of services, with regional companies to acquire donations and contracts, with the university for project development, and with the media to raise awareness. In addition, all organizations are members of networks to represent the concerns of their target groups, foster exchange, and promote the development of innovations. This highlights the organizations' intermediary position between the state, the market, and neighborhood and family economies, which creates opportunities for participation and shaping society.

Regarding opportunities for internal employee participation, formal settings such as team meetings, workshops, and employee interviews were mentioned. In addition, there are informal, low-threshold opportunities for exchange and discussion in order to contribute suggestions. In the area of inclusion, two organizations emphasized actively involving employees in service development in the form of projects and enabling opportunities for client participation.

These initial findings from two selected fields of action, reveal a tendency for the organizations surveyed to have a broad range of internal and external stakeholders, enriched by numerous collaborations and networks, which can be linked to SDG 17 "Partnerships for the Goals" and to a stakeholder-driven business approach. In addition, their primary social objectives, their alternative economic orientation, and their ecological emphases prove to be conducive to sustainable transformations in society, featuring core SDGs like: No poverty, No hunger, Quality education, Health and well-being, Reduced inequalities, Decent Work, Sustainable Consumption and Production and climate protection. However, this also comes with challenges, from which development opportunities can in turn be derived.

Challenges and Opportunities

Several challenges were identified in the interviews. Two of these are highlighted here.

Funding: donations as an uncertain source in the field of poverty reduction

The interviews in the field of poverty prevention reveal that financing is challenging. All four organizations surveyed rely to a certain extent on donations, both in terms of goods and money, in addition to public support. This is an uncertain source of funding because a) it depends on people's willingness to donate and b) it requires more than calculated when demand increases, as it has been the case with persistently high inflation since 2022. In addition, there has been an increase in the commercial recycling of clothing and food. The interviewees welcome this in principle because of its environmental impact. However, they criticize the fact that it does not pursue any social goals. They note that products that are commercially recycled are lacking in poverty support distribution centers. The organizations surveyed are calling for an increase in both political and social responsibility. In the future, it will be important to a) increase the responsibility of public institutions to invest meaningfully and sustainably in poverty reduction, b) raise awareness of the issue in society so that more people get involved through donations or volunteer work, and c) win commercial providers in the circular economy as partners for poverty reduction projects.

Resource-efficient Management: Lack of public transport in rural areas

In the area of inclusion, according to statements by the three organizational representatives, resource-efficient management is reaching its limits due to restrictions on public transport. Even though the organizations are making efforts to encourage their employees to use public transport, especially in mobile services, this is not always possible, particularly in rural areas, due to the inadequate development of public transport. The central perspective is therefore to call for increased expansion of public transport in rural regions. Politicians need to develop appropriate support structures in cooperation with the businesses and communities in order to enable sustainable mobility.

Concluding Trend: SDGs as an Opportunity

Even though the empirical results refer to a limited section, they tend to reflect the theoretically derived points of reference between sustainable development and social economy organizations in the field of social work. It is their primary social objectives, their services, and their methods that commit them to achieving key, primarily socially oriented SDGs. But they also emphasize alternative economic and ecological approaches through their economic and organizational structure. This is manifested in their non-profit-maximizing orientation, their financing mix, and their ecologically sustainable business areas. Regarding participation and cooperation, as

social economy organizations, they open up opportunities due to their intermediate position between the market, the state, and civil society. They mediate between individuals, organizations, and institutional bodies. In this way, they contribute to the development of needs-oriented services in the sense of social innovations and can help shape socio-political framework conditions through critical reflection and networked action.

The challenges and perspectives that have emerged from the empirical research also illustrate that social work organizations are directly confronted with changing social problems and that social work, in the sense of a human rights profession, is called upon to help shape social change. The challenges reflect trade-offs and the need for action, with the option of developing solutions together across sectoral boundaries. They refer to the tension between social demands and needs, economic and ecological motives, and structural limitations. This once again makes it clear that sustainable development is a complex, interdisciplinary and transdisciplinary project that requires the participation of various actors. Focusing on the SDGs can open up opportunities for social work organizations to highlight their socially relevant achievements and communicate social needs within a broader multidisciplinary framework, as well as to develop solutions in a participatory manner with the involvement of actors from related sectors - as suggested, for example, by the interviewees with regard to financing in the field of poverty prevention. Not least because of this, they are considered as key partners to be involved in sustainable development processes, as already emphasized by the United Nations in Agenda 21 (cf. United Nations, 1992, 288).

This raises the question of how social work organizations can be more involved in the multidisciplinary discourse on sustainability in the future, which could lead to a new perception of the organizations, new opportunities for funding and thus also for innovation. In this context, it should also be mentioned that the debate on sustainable development in social work has intensified in recent years - the topic has moved “from the margins to the centre in theory and practice,” as Elsen (2023a, 265) puts it. Nevertheless, there is still room for improvement. Against this background, this article should also be read as an invitation to continue reflecting on and critically discussing these issues in the future.

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THE ORDER-TO-ORDER LEAP: REDEFINING ORGANISATIONAL CHANGE IN TIMES OF CRISIS

Stefania Zanda

Associate Professor, Department of Management, Sapienza University of Rome

Francesca Castaldo

Researcher, CASD-SSU Centro Alti Studi Difesa, Scuola Superiore Universitaria

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Abstract

Radical organisational change is frequently theorised as a process that necessarily entails phases of instability or chaos. This conceptual paper challenges that assumption, questioning models from the Lewinian framework (1947) to edge-of-chaos dynamics (Stacey, 1996), and proposing that organisations, understood as complex systems, can transition directly between qualitatively different ordered configurations. Drawing on complex-systems physics (Prigogine, 1977), sensemaking theory (Weick, 1995), and narrative resilience (Cyrulnik, 2002), the paper conceptualises change as a discrete leap sustained by the continuity of the identity narrative. Its original contribution lies in identifying digital heritage as a critical infrastructure for transitional coherence, capable of neutralising the supposed necessity of ontological disorder. Crisis is reinterpreted as a critical configuration that destabilises existing parameters of order without inherently producing disorder, while the role of power flows and identity narratives is examined as a fundamental dimension of organisational order. The paper culminates in the formulation of original conceptual propositions intended to guide future empirical enquiries into the stability of power flows and digital memory in both private enterprises and public administrations.

Introduction

The contemporary landscape of organisational management is dominated by a narrative that frames change as an inherently traumatic process, a transition requiring a phase of disruption of established equilibria before new forms of efficiency can materialise. This framing pervades both scholarly and practitioner discourse (Todnem By, 2005; Stouten *et al*., 2018; Burnes, 2004), reflecting a deeply entrenched assumption that organisational transformation necessarily

entails a period of destabilisation before a new order can consolidate (Armenakis and Bedeian, 1999; Van de Ven and Sun, 2011).

Periods of organisational crisis are typically associated with instability, ambiguity, and loss of control. In the classical literature, crisis is often treated as synonymous with disorder: a necessary collapse preceding the emergence of a new settlement. This assumption sustains influential models, from Lewin's (1947) tripartite unfreeze, change, refreeze framework to the subsequent evolutions of sequential Change Management (Kotter, 1996), which postulates the existence of a 'void' or chaos phase (unfreeze) as an obligatory passage between two ordered states, and to complexity-informed perspectives that emphasise turbulence and instability as engines of change (Stacey, 1996). Nevertheless, the sciences of complex systems, from Prigogine's (1977) pioneering studies on dissipative structures to Kauffman's (1993) self-organisation dynamics, suggest that systems need not collapse into disorder in order to evolve; they may instead traverse configurational leaps governed by internal control parameters. Empirical observations likewise suggest that certain organisations succeed in accomplishing radical transformations while maintaining a remarkable degree of internal coherence, transitioning directly from one structured configuration to another (Carroll, Bjørnson, *et al*., 2020).

The present work challenges the prevailing equation between crisis and disorder by proposing a conceptual framework in which organisations can move between qualitatively different ordered states without traversing a phase of chaos, provided that systemic coherence is preserved during the transition (Childre, 2000).

The article is conceived as a conceptual paper aiming to dismantle the dogma of 'necessary chaos' by integrating organisation theory with narrative resilience (Cyrulnik, 2002; Ricoeur, 1990).

The central hypothesis is that the identity of a system resides not in the stability of its routines but in the continuity of its narrative. The principal objective is to propose a framework termed 'order-to-order transition', in which radical change occurs through a discrete leap between systemic configurations without the system forfeiting its ontological coherence. This concept aligns with configurational approaches to organisational theory (Meyer *et al*., 1993; Miller, 1996) and with recent empirical evidence on coherent large-scale transformations (Carroll *et al*., 2020; Carroll, Conboy and Wang, 2023).

Within this context, digital heritage is not merely a data archive; it constitutes the material substratum that guarantees the ‘holding power’ of the organisational narrative throughout the transformation.

In order to guide the theoretical analysis towards the formulation of testable propositions, the research addresses the following research questions:

RQ1: In what way does the preservation of narrative coherence enable a complex organisation to bypass the phase of ontological disorder during radical change?

RQ2: What role does digital heritage play, as an infrastructure of resilience, in maintaining the legibility of power flows and systemic identity during a configurational leap?

The paper makes four principal contributions. Firstly, it calls into question the widely held belief that disorder is an unavoidable stage in crisis-driven transformation, instead interpreting crisis as a problem of legibility rather than structural rupture. Secondly, it introduces a discrete-state conceptualisation of organisational change centred on the coherence between power flows and identity narratives. Thirdly, it identifies digital heritage as a crucial enabler of transitional coherence, demonstrating how contemporary information systems create conditions for previously unattainable order-to-order transitions. Fourthly, it derives three conceptual propositions intended to guide future empirical enquiries.

Methodology

Given the strictly conceptual nature of the present work, the methodology does not draw upon primary empirical data collection but rests on a procedural rigour of systematic theorisation and deductive synthesis. This approach is consistent with established templates for conceptual research design in the management sciences (Jaakkola, 2020; MacInnis, 2011; Whetten, 1989). As Jaakkola (2020) argues, conceptual papers must be grounded in a clear research design in which the choice of theories and their role in the analysis are explicated and justified.

The research trajectory initially proceeds through a comparative analysis of the existing literature, designed to isolate and critique the assumption of ‘necessary chaos’ in contexts of high digital density. The chosen approach aims to identify the structural conditions that enable the system to leap from one power configuration to another while maintaining the continuity of sensemaking, without passing through the unfreezing phase prescribed by traditional models.

Subsequently, the method employs a generative-analogy modelling technique, transposing the principles of discrete-state systems physics to the organisational sciences in order to conceptualise change as a direct configurational leap, termed an order-to-order transition.

Consistent with the stated objectives of furnishing testable analytical tools, the methodology culminates in the logical derivation of a series of conceptual propositions. The latter emerge from the intersection between the dynamics of power flows and the resilience of digital memory infrastructures, defining the critical variables that enable transitional coherence. The resulting output is therefore not a static analysis but a dynamic theoretical model prepared for empirical validation through future case studies or longitudinal analyses in both public and private settings. The logical derivation of propositions from theoretical premises follows established practices of deductive conceptual reasoning in organisation studies (Dubin, 1978; Bacharach, 1989; Shepherd and Suddaby, 2017).

Theoretical background

The theoretical foundation of this paper rests upon the systematic deconstruction of the assumption that disorder constitutes an obligatory passage in organisational change. Although established models such as punctuated equilibrium (Gersick, 1991) and dialectical change (Van de Ven and Poole, 1995) posit the disruption of existing equilibria as a precondition for deep transformation, this work exposes a logical fallacy in the conflation of instability in interpretative frameworks with the operational collapse of the system.

Such a perspective clashes with Mintzberg's (1979; 1983) view that organisational effectiveness resides in the coherence between structural parameters and situational factors; in this reading, disorder is not a creative phase but a rupture of configurational harmony that may precipitate decline.

In this vein, the Business Process Reengineering programme of Hammer and Champy (1993) sought to theorise radical leaps (*tabula rasa*), yet frequently underestimated the chaos generated by the loss of historical memory. It is at this juncture that Davenport's (1993) contribution becomes pivotal, identifying information technologies as the engine of process redesign. Advancing this insight, we contend that digital heritage does not serve to erase the past but to function as an ontological anchor.

The present work draws on Weick's (1995) sensemaking theory to distinguish between disorder as an ontological condition and disorder as a perceptual phenomenon.

Following the perspective of Weick *et al*. (2005), the crisis disrupts the *plausibility* of existing accounts rather than organisational functioning itself: decisions continue to be taken and power exercised, but the categories used to interpret such processes become unstable.

This reconceptualisation builds upon earlier enquiries into negentropy in crisis conditions (Zanda and Castaldo, 2023) and the effectiveness of algorithmic management in data-driven organisations (Zanda and Castaldo, 2024), identifying in digital heritage not merely a technical asset but the material support for the narrative resilience of the system.

Analytical lens

Organisations as discrete-state systems

In this paper we conceptualise organisations as systems characterised by discrete states rather than continuous change. Each organisational state corresponds to a relatively stable configuration of structures, practices, and meanings. Change, in this view, occurs through configurational shifts rather than gradual adjustments (Meyer *et al*., 1993).

This perspective aligns with configurational approaches to organisational theory and challenges linear models of transformation. Significantly, it allows for the possibility that transitions between states can occur abruptly and without intermediate phases lacking structure.

Power flows and identity narratives

Power flows

Decision-making drives organisational functioning; the set of decisions, fuelled by internal and external information and increasingly integrated with various information technology tools, shapes organisational planning (Zanda, 2003).

We define power flows as the dynamic channels through which influence over decisions, resources, interpretations, and legitimacy circulates within the organisation. Power flows are distinct from formal authority structures; they capture how power operates in practice rather than how it is officially allocated (Clegg, 1989). In stable organisational states, power flows are relatively consistent: decision-making authority, resource allocation, and interpretative influence tend to reinforce one another. During change, these flows can be reconfigured, giving rise to new centres of influence and decision-making.

Power operates through discourse and regimes of knowledge, suggesting that control over interpretation is not secondary to authority but constitutive of it (Foucault, 1980). During periods of organisational or institutional change, however, these mutually reinforcing relationships can be disrupted. Giddens' structuration theory explains how shifts in rules and resources can loosen established power relations, permitting new actors to reinterpret norms and practices (Giddens, 1984). In situations of crisis and shifting scenarios, actors who control

critical areas of uncertainty, such as staff bodies, or mediate between competing interpretations can acquire influence without formal authority (Crozier and Friedberg, 1980). Structural transitions, including decentralisation or professionalisation, frequently relocate decision-making and interpretative power to new organisational centres: experts, project teams, or external networks (Mintzberg, 1983).

Identity narratives

Identity narratives refer to the shared stories, symbols, and categories through which an organisation defines who it is, what it does, and what constitutes legitimate action. Unlike the broader notion of organisational culture, identity narratives are performative and action-oriented: they enable and constrain behaviour by rendering certain actions natural and others unthinkable (Gioia *et al*., 2013).

Identity narratives serve as a cornerstone of continuity over time for organisations, yet they can also become misaligned with emerging power flows during periods of crisis. A comprehensive review of key scientific contributions on identity leadership highlights that identity narratives can produce both cohesion and negative outcomes when they are misaligned with organisational power and practices, suggesting that changes in identity narratives without concurrent alignment with authority and reference resources can engender dysfunction rather than productive transformation (Le and Hoang, 2025). We therefore assume that identity narratives are continuously reshaped by power dynamics and are not rigid background structures (Iftikhar and Sergeeva, 2024).

Coherence and disorder

We posit that organisational order depends on the coherence between power flows and identity narratives. Disorder may emerge not when one of the two dimensions changes but when they change asynchronously. In this sense, disorder is a relational phenomenon resulting from a loss of alignment rather than a necessary phase of transformation. Recent empirical research on large-scale organisational transformations confirms that coherence, understood as a collective understanding of transformation goals and methods across organisational levels, is a critical determinant of transformation success (Carroll *et al*., 2020). When power reconfigurations and shifts in identity narratives occur without synchronisation, organisations experience the dysfunction commonly attributed to chaos during change.

Digital heritage and transitional coherence

Maintaining transitional coherence during order-to-order transitions increasingly depends on what we term digital heritage: the accumulated repository of codified organisational knowledge, decision-making precedents, process documentation, and operational data maintained within information systems. Digital heritage constitutes a fundamental component of organisational identity narratives at the productive level, functioning both as a memory substrate and as a coordination mechanism (Al-Oqili *et al*., 2024; Digital Workplace Group, 2025).

For productive organisations, digital heritage serves as the material foundation of narrative identity by preserving historical documentation of how procedures are conducted and the rationale underpinning them (Gioia *et al*., 2013). This accumulated knowledge enables organisations to maintain transitional coherence during order-to-order transitions by providing continuity in coordination mechanisms even as power flows and identity narratives undergo reconfiguration.

The concept of transitional coherence has only recently become fully achievable, enabled by the integration of information systems into both decision-making processes and concurrent coordination and control functions (Hamdat *et al*., 2024; Nisrina *et al*., 2024; Irwansyahputra and Khairot, 2025).

This integration represents a qualitative shift: whereas historical organisational transformations relied primarily on informal knowledge transfer and tacit coordination, contemporary organisations can maintain transitional coherence through systematically codified digital assets. The efficiency of information systems in processing, storing, and retrieving organisational knowledge permits alternative configurations to emerge within preserved coordination boundaries without descending into disorder (Riedl *et al*., 2016). Digital heritage, embedded in information systems, amplifies these conditions during transition by ensuring the continuity of the shared context.

Order-to-order transitions in organisational change

Building upon the preceding analysis, we propose that organisations can undergo order-to-order transitions, moving directly from one coherent configuration to another without traversing a phase of disorder. Such transitions require that emerging power flows be permitted to stabilise before being forced into existing identity narratives, and that identity narratives be revised without prematurely constraining new forms of action (Weick and Quinn, 1999).

Giddens' structuration theory has already rejected the notion that order and disorder are opposites; order is perpetuated through the recursive alignment of rules and resources,

implemented in practice. An order-to-order transition is reflected in what Giddens (1984) would describe as a moment when rules are bracketed rather than abandoned, a partial mobilisation of resources while interpretative frameworks undergo reconfiguration. Disorder emerges not as a consequence of a shift in rules; rather, it is the result of a change in interpretative frameworks while the underlying resource structures remain unchanged, or vice versa, an asynchronous modification of the duality of structure.

To illustrate this process, a generative analogy can be drawn with order-to-order transitions observed in complex systems, where systems move from one ordered phase to another without an intermediate disordered state. In such cases, transitional coherence is sustained through the temporary suspension of the prevailing parameters of order, thereby permitting new configurations to emerge (Palmigiano *et al*., 2017). Organisational order, like order in complex systems, is not a binary state but rather a parameterised configuration of constraints. Order-to-order transitions in complex systems indicate that systems can move from one coordination regime to another without traversing a phase of disorder, provided that the dominant parameters of order are temporarily suspended rather than dismantled and that secondary constraints continue to stabilise the system (Haken, 2006).

In organisational contexts, leadership plays a pivotal role not by imposing control but by protecting the transition space in which new configurations can form (Heifetz and Laurie, 1997). Attempts to restore familiar structures and narratives precipitously can inadvertently generate the very chaos they seek to avert.

Main findings and contributions

The findings of this analysis lead to a reconceptualisation of crisis not as a state of necessary disorder but as a moment of ‘hypersensitivity to parameters’, challenging Kotter’s (1996) sequential approach, which views traumatic unfreezing as the sole avenue for overcoming inertia. On the contrary, the principal contribution resides in having isolated transitional coherence as a dependent variable conditioned by the stability of narrative and technological infrastructures. It is observed that if the organisation preserves its digital heritage and the legibility of power flows (Zanda, 1979), the passage between Mintzberg’s (1983) configurations can occur as a discrete leap, minimising transaction costs and the structural inertia typically described by Hannan and Freeman (1984).

In order to synthesise this paradigm shift with respect to the classical literature, the proposed model is summarised in the following comparative table:

Dimension	Traditional Model (Crisis as Chaos)	Proposed Model (Order-to-Order Transition)
Nature of Crisis	Necessary collapse; ontological disorder	Critical configuration; loss of legibility
Process	Linear (Unfreeze → Chaos → Refreeze)	Discrete (Leap between ordered configurations)
Mechanism	Structural inertia (Hannan and Freeman)	Transitional identity coherence
Enabling Factor	Disruption of systems (Kotter; Lewin)	Digital Heritage as structural anchor
Logic	Disintegration of form (Mintzberg)	Migration between coherent states (Zanda)

Table 1: Comparison between the traditional crisis model and the proposed model.

On the basis of this framework, the work arrives at the formulation of three conceptual propositions that constitute the output for future empirical research in both the public and private spheres.

The first proposition addresses the relationship between digital heritage and structural inertia. Hannan and Freeman (1984) famously argued that organisational structures are characterised by strong inertial forces that resist transformation, with selection pressures favouring reliable and accountable forms over adaptive ones. However, the theoretical analysis developed in this paper suggests that the accumulation of codified organisational knowledge within digital information systems alters the conditions under which structural inertia operates. When decision-making precedents, process documentation, and operational data are systematically preserved and accessible (Al-Oqili *et al*., 2024; Digital Workplace Group, 2025), the organisation possesses a coordination substrate that can support the reconfiguration of structures without the loss of institutional memory that typically accompanies disruptive change. This reasoning leads to the formulation of the following proposition.

Proposition 1 - The persistence of a structured digital heritage attenuates structural inertia (Hannan and Freeman, 1984), facilitating the passage between different Mintzberg configurations without intermediate phases of disorder.

The second proposition concerns the moderating role of power flow legibility during crisis. Stacey (1996) characterised organisational crisis as a state in which predictability is lost and the system approaches the "edge of chaos". Weick (1995) and Weick *et al*. (2005) further demonstrated that the collapse of sensemaking, rather than operational failure per se, constitutes the principal threat during crisis. The analytical framework developed here integrates these perspectives by arguing that the legibility of power flows, defined as the dynamic channels through which influence over decisions, resources, and legitimacy circulates (Clegg, 1989; Foucault, 1980), acts as a critical moderator between the loss of predictability and the collapse of collective sensemaking. This argument yields the second proposition.

Proposition 2 - The legibility of power flows during crisis, supported by resilient information infrastructures, acts as a critical moderator in preventing the loss of predictability (Stacey, 1996) from translating into a collapse of organisational sensemaking (Weick, 1995).

The third proposition extends the framework to complex organisations in both the public and private spheres, addressing the relationship between transitional coherence and organisational trauma. The concept of organisational trauma, understood as the cumulative dysfunction resulting from the loss of interpretative coherence during radical change (Castaldo, 2022), has been implicitly assumed by traditional models as an unavoidable cost of transformation. The present analysis challenges this by arguing that the capacity to maintain transitional coherence through digital assets, that is, the integrated deployment of codified knowledge, decision-making precedents, and coordination mechanisms within information systems (Riedl *et al*., 2016; Okhuysen and Bechky, 2009), reduces the organisational trauma associated with radical change. In public administrations, where institutional legitimacy and the continuity of service provision are paramount (Mintzberg, 1979; Zanda G., 1979), the preservation of transitional coherence through digital heritage enables configurational leaps that protect both operational value and the institutional trust upon which democratic governance depends. This reasoning leads to the third and final proposition.

Proposition 3 - In complex organisations (both public and private), the capacity to maintain transitional coherence through digital assets reduces organisational trauma, enabling direct configurational leaps that preserve value and institutional legitimacy.

The three propositions have been deliberately formulated at a level of abstraction that permits empirical testing across a range of organisational settings. The following aspects require elucidation: (a) the manner in which organisations of varying sizes and sectors manage coherence during radical transitions; (b) the conditions under which information systems effectively support transitional coherence as opposed to those in which they rigidify existing configurations and hinder the requisite transformation; (c) the role of identity narratives in modulating the relationship between power flow reconfiguration and organisational disorder; and (d) whether the order-to-order transition model applies differentially to public administrations, characterised by strong institutional inertia (Hannan and Freeman, 1984), and to private enterprises, where market pressures may accelerate configurational leaps.

Originality and value

The originality of this research lies in its transcendence of the linear “State A - Chaos - State B” model, proposing instead a configurational migration that harmonises systems theory with

classical management. Its distinctive value stems from identifying digital heritage as the factor capable of neutralising the supposed necessity of chaos, thereby preserving operational and narrative continuity even under extreme structural stress.

In an era of *polycrisis* and pervasive digitalisation, this framework provides a path to resilience founded not on resistance to impact but on the capacity to evolve while maintaining permanent ontological and structural coherence (Castaldo, 2019; 2022).

Theoretical and practical implications

On the theoretical plane, the research suggests the necessity of interpreting change not as a discrete and traumatic event characterised by Lewinian unfreezing, but as the continuous management of transitional coherence. Such coherence constitutes a permanent state in which stability and transformation coexist, nourished by the informational patrimony.

From the operational standpoint, this framework profoundly redefines the role of decision-makers in both the private sector and public administration. For managers, the strategic priority shifts from the management of instability, understood by Kotter (1996) as a necessary phase, to the maintenance of the legibility of organisational action. In crisis conditions, the leader must operate as an architect of meaning, employing digital heritage to furnish constant flows of data and narratives that prevent the collapse of collective sensemaking (Weick, 1995).

For public administration in particular, the valorisation of digital memory is transformed from a bureaucratic obligation into a strategic reserve of legitimacy, capable of counteracting the structural inertia characteristic of mechanistic bureaucracies (Hannan and Freeman, 1984; Mintzberg, 1979). Drawing upon a coherent identity narrative furthermore enables the reduction of social and institutional frictions typical of large-scale reforms, facilitating configurational leaps that preserve the stability of power (Zanda G., 1979). Ultimately, the leadership of discrete transitions demands the capacity to reconfigure routines in real time, transforming crisis from a threat to order into a catalyst for a superior equilibrium.

Conclusion

Crisis does not necessarily propel organisations into chaos. Rather, it exposes the fragility of existing interpretative frameworks and power configurations. By conceptualising organisational change as a sequence of order-to-order transitions, this article offers an alternative lens for understanding transformation in crisis conditions. Recognising disorder as a contingent outcome rather than a necessary phase opens up new possibilities for both the theory and practice of organisational change.

The contemporary availability of sophisticated information systems and the accumulation of digital assets fundamentally alter the conditions under which transitional coherence can be maintained. As organisations increasingly depend on codified knowledge and integrated decision-making systems, the ability to navigate order-to-order transitions without descending into disorder becomes not merely theoretical but practically achievable. Future research should therefore examine how organisations can strategically develop and deploy digital assets to support phases of transformation and, as anticipated, under what conditions information systems function as enablers as against impediments to transitional coherence.

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HUMANSIGMA IN HOSPITALITY MANAGEMENT: INTEGRATING EMPLOYEE AND CUSTOMER ENGAGEMENT FOR EXCEPTIONAL PERFORMANCE

Vasileios Ismyrlis, Paul Charalambous

Department of Tourism Economics and Management**,** University of the Aegean**,** Greece.

Keywords: HumanSigma, Customer engagement, Employee engagement, Hospitality management, employee well-being, organizational performance.

Introduction

Hospitality is about people and they are made to feel. Guests remember genuine and caring interactions. While frameworks like TQM and SERVQUAL can improve consistency, they ultimately overlook the human side of service (Parasuraman et al., 1988) specifically in the hospitality industry. With the rising expectations of guests and burnout of employees, hospitality needs a more people-focused approach.

Purpose, Aim and Objectives

This study is motivated by the close link between the employee's wellbeing and the experience of the customer in the hospitality industry. It will explore how the HumanSigma framework can improve the understanding of service quality and organizational performance. Using existing and recent literature, this extended abstract examines the interaction between the employees and customers engagement in the hospitality industry, highlighting practical insights for managers

Literature Review and Theoretical Framework

Research suggests that hospitality always highlights the role of frontline employees in the way they shape the experience of guests. It is said that employees that are engaged in their work are more likely to demonstrate empathy, emotional intelligence and no effort, all of which contribute positively to service encounters (Karatepe, 2013;Liu et al.,2024). Employee engagement theory suggests that individuals are more engaged when they experience something meaningful, psychological safety and a sense that they belong at work (Kahn, 1990 ; Saks, 2006).

On the other hand, customer engagement literature emphasises emotional connections, trust and relational bonds as critical drivers of loyalty and positive behavioural intentions (Brodie et al.,2011; Chen et al., 2022).
Service – dominant logic further strengthens this relational view by positioning value as co-created through interactions between the employees and the customers rather than being one-sided by the organizations (Vargo and Lusch, 2008)

Methodology and Methods

This study adopts a qualitative research design based on associated literature review. Peer review journal articles, empirical studies and industry reports that were published between 2005-2025 were reviewed.

Main Findings and Contribution

The HumanSigma framework integrates these perspectives by declaring that employee and customer engagement is a single form system that should be measured and managed together (Fleming et al., 2005). Recent research shows that when the well-being of employees is a priority, the experience of customers also improves thus leading to a more sustainable organisational outcome (Yu, 2024; Saito et al., 2025).

Hospitality organisations perform better when the engagement of employees and customers are both aligned. Engaged employees can create genuine, positive interactions that will strengthen customer satisfaction and loyalty. On the other hand, engaged customers can help create a positive work environment which will boost employee motivation and commitment.

Originality and Value

This expanded abstract contributes to hospitality management research by applying the HumanSigma framework and showing that employee engagement and customer satisfaction are connected and not separated. This expanded abstract can offer clear and practical value to researchers and industry practitioners.

Research Limitation

As an expanded abstract, this research does not include primary empirical data. The conclusions are dependent on the scope and quality of existing literature.

Theoretical and Practical Implications

Theoretically, this expanded abstract supports a human centred framework within hospitality management It suggests that managers should simultaneously invest in the wellbeing of employees but also the initiatives of customer engagement, rather than prioritising the one over the other. Future research could test HumanSigma relationships across the hospitality sector and explore cultural differences in the dynamics of engagement.

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FROM CLIMATE VARIABILITY TO MIGRATION: THE ROLE OF AGRICULTURAL PRODUCTION

Saleem, Nouman[1]; Smirnova, Janna[1]

[1]Department of Economics, Statistics and Finance, Università della Calabria, Rende, Italy

Keywords: Climate Change, Agricultural Production, Migration, South Asia.

Abstract

Despite the increasing migration from South Asia, very little is known about climate-induced migration and its driving mechanisms in this region. This study examines the mediating role of agriculture in climate-migration nexus using yearly net migration panel data from 1990 to 2022 by employing the 2SLS instrumental variable approach. The findings reveal that the decline in agricultural production, due to critical variability in temperature and precipitation, is strongly associated with increased out-migration from South Asia. Additionally, the study shows the importance of institutional enforcement in determining the climate-migration relationship in South Asia, while factors related to economic growth appear to be less relevant than expected. Overall, the analysis highlights the importance of climate-resilient and sustainable agricultural policies, as well as improvement of institutional quality, in addressing the challenges posed by climate-induced migration.

Introduction

The climate-migration nexus through the agriculture channel is referred to as the interconnected relationship among climate change, agricultural production, and migration. As known, migration is a complex phenomenon driven by many socioeconomic, political, demographic, and climatic factors (Adger et al., 2014). It is difficult to ignore the role of other factors in international migration, such as income sources (Rosenzweig & Stark, 1989), health shocks (Deschênes & Moretti, 2009), bad political institutions (Dell et al., 2012), and conflicts (Hsiang et al., 2011). As for climate impact, the decision to migrate due to climate change depends not only on

environmental conditions but also on other migration factors, such as economic, social, political, institutional, and conflict-related factors (Marotzke & Milinski, 2020). However, the study of Cai et al. (2016) suggested that agriculture is an important intermediary factor between climate change and international migration. In addition, the climate-migration nexus highlights the role of climate change impacts on agriculture as a key driver of migration, particularly in developing countries where livelihoods heavily depend on the agricultural sector. Thus, it can be hypothesized that agriculture plays a key mediating role in determining the climate–migration relationship (Cai et al., 2016).

The climate-migration literature has evolved over recent decades, highlighting the growing importance of climate factors in migration decisions (Hunter et al., 2015; McLeman & Gemenne, 2018). Empirical evidence indicates that rising temperature is a key driver of climate-induced migration, with heat stress contributing to long-term rural out-migration in Pakistan (Bohra-Mishra et al., 2014; Mueller et al., 2014). Sudden climatic shocks, such as floods, can trigger large-scale and permanent displacement (Sastry & Gregory, 2014). Empirical studies show that both natural disasters and long-term climate factors such as temperature and precipitation significantly drive international migration (Beine & Parsons, 2015) from developing countries (Drabo & Mbaye, 2015), with sudden events inducing more frequent migration than slow-onset shocks like droughts (Koubi, 2016).

Subsequent studies then show that migration is particularly sensitive to climate variability, such as temperature and precipitation anomalies, especially in agriculture-dependent communities (Hunter et al., 2015; Mastrorillo et al., 2016), as non-linear temperature effects are more severe on major crops yield (Schlenker & Roberts, 2009; Saleem & Smirnova, 2026), and agricultural GDP (Cai et al., 2016), thereby leading to both temporary and permanent migration when losses become unmanageable (Deshingkar & Akter, 2009; Warner, 2010).

Close to our study is that by Falco et al. (2019), which employs a global panel of 108 countries (1960–2010) to link climate-induced agricultural productivity shocks to international migration using a 2SLS approach based on decadal-average data for both climate change and migration. The study supports an interpretation of agriculture as a key migration channel in response to climate variability; however, averaging data over ten-year periods may smooth short-term fluctuations and subsequently compromise the immediate climate-induced migration responses, making it challenging to capture the migration process. In fact, there remains a lack of understanding

regarding climate-induced migration and its most significant driving channel, as the evidence is quite mixed and mostly based on 5-yearly and decadal data, which overlooks short-term migration patterns (Coniglio & Pesce, 2015).

To fill these gaps, this study aims to analyze how climate variability impacts migration in South Asia by examining the influence of temperature and precipitation fluctuations on agricultural production and, in turn, how changes in agricultural production affect migration, serving as a driver of out-migration in South Asia. To overcome issues with long-term averages, the present study intends to utilize annual net migration rate data, facilitating a better understanding of how short-term and medium-term climate variability, such as floods and fluctuations in temperature and precipitation, affects migration patterns. This is particularly important to climate-induced migration analysis, as climatic shocks can have immediate consequences on livelihoods, especially in agriculture-dependent regions.

Model

We adopt 2SLS approach to address the endogeneity issue between agriculture and migration, by utilizing climate variables e.g., temperature and precipitation variation, as instruments to predict agricultural outcomes in the first stage, thereby ensuring that the estimated relationship between agriculture and migration is not biased by reverse causality. By using predicted agricultural outcomes from the first stage in the second stage, the method ensures that the variation in agriculture caused by climate shocks is used to estimate their effect on migration.

The analysis is based on the following equations (1) and (2):

$$AP_{it} = \gamma_0 + \gamma_1 C'_{it} + \gamma_2 Z'_{it} + b_t + c_i + \varepsilon_{it} \quad (1)$$

$$NMR_{it} = \beta_0 + \beta_1 \widehat{AP}_{it} + \beta_2 Z'_{it} + b_t + c_i + \epsilon_{it} \quad (2)$$

Where (AP_{it}) is the log of agricultural production, (C'_{it}) is the vector of climate variables such as temperature and precipitation variability. Following the literature (Schlenker & Roberts, 2009; Cai et al., 2016), we add the squared terms of the climate variables to capture the non-linear impacts of climate variability on the net migration.

In addition, (Z'_{it}) is the vector of control variables that includes GNI per capita, unemployment rate, remittances, education, and institutional quality. To control unobserved heterogeneity, the model incorporates both year (b_t) and county (c_i) fixed effects in estimating the relationships among climate, agriculture, and migration. Country fixed effects account for time-invariant characteristics, such as network effects, geographic or institutional factors. In contrast, year fixed effects capture global temporal influences, such as technological progress or international policy changes. The inclusion of fixed effects also reduces the bias caused by omitted variables.

In the first stage, using equation (1), the endogenous regressor, that is, the log of agricultural production (AP_{it}), is regressed on the log of exogenous climate variables C'_{it}, temperature and precipitation variability, that serve as instrumental variables and on the log of other control variables. The goal of the first stage is to generate a predicted value of $\widehat{AP}_{it}$, which captures the variation in AP_{it} that is exogenous (not correlated with unobserved migration determinants). The idea is that we assume climate variables influence agriculture but do not directly affect migration, except through their impact on agriculture. After that, the predicted value of agricultural production $(\widehat{AP}_{it})$, from the first stage is used as an independent variable in the second-stage regression equation (2). This ensures that $(\widehat{AP}_{it})$ is exogenous, allowing us to obtain an unbiased estimate of (β_1), which represents the elasticity of agricultural output per capita on net migration rate.

In contrast to Falco et al. (2019), we use yearly net migration data, which allows for a more detailed analysis of migration patterns, instead of relying on aggregated intervals. Moreover, annual data provide enhanced temporal precision, capturing short-term fluctuations and immediate responses to changes in climatic and socioeconomic factors that longer intervals may overlook due to smoothing effects (Massey et al., 2001; Czaika & Haas, 2014). Furthermore, annual data also allows for more timely monitoring of migration trends, which is essential for effective policy interventions in response to climatic shocks (United Nations, 2019).

We use climate variability measures such as fluctuations or anomalies in temperature and precipitation, rather than average annual values of temperature and precipitation to gain a deeper and more accurate understanding of climatic impacts on agriculture and migration. Climate variability captures the occurrence of extreme weather events, such as droughts, floods, and heatwaves, that often have significant and immediate impacts on agricultural production and human migration decisions. In fact, policy interventions also often aim to mitigate impacts from extreme weather events rather than average conditions (IPCC, 2022).

Data

The study uses a panel dataset, covering the period from 1990 to 2022, of the four South Asian countries, such as Bangladesh, India, Nepal, and Pakistan, that are among the most climate-vulnerable globally, facing recurrent monsoon variability, floods, droughts, and extreme heat waves (IPCC, 2022).

Net migration rate (NMR) data are obtained from the United Nations, Department of Economic and Social Affairs, Population Division (2024). It is calculated by using equation (3), and the result is multiplied by 1,000 to express net migration per 1,000 people.

$$Net\ Migration\ Rate = \frac{Immigration\ (Migration\ inflows) - Emigration\ (Migration\ Outflows)}{Mid\text{-}Year\ Total\ Population} \times 1000 \qquad (3)$$

It is expected that increased climate stress may lead to higher emigration, resulting in a decrease in NMR. According to the International Labour Organization (2018), migration from South Asian countries is predominantly outward.

Agricultural production (AP) data, measured as gross production value per capita (constant 2014–2016, thousand international $), are sourced from FAOSTAT (2022). Higher AP reflects greater economic stability in agricultural economies, which can reduce migration pressures by improving local livelihood opportunities.

For climate variables, temperature variability (TVAR) and precipitation variability (PVAR) are constructed following Marchiori et al. (2012), using annual mean temperature (°C) and total annual precipitation (mm) data from the World Bank Climate Change Knowledge Portal (2022). Climate variability is measured as the deviation from a country's long-term average, normalized by the long-term standard deviation:

$$Climate\ Variability\ (CV) = \frac{X - \mu}{\sigma} \qquad (4)$$

Here, (X) denotes observed temperature or precipitation in a given year, (μ) is a long-term average of temperature or precipitation, and (σ) is the the corresponding standard deviation over the reference period (1990 – 2022). A positive value (CV > 0) indicates above-normal temperature or precipitation, while a negative value (CV < 0) indicates below-normal conditions. Given trends

of global warming, and following geoscience studies evidence on the positive relation between temperature and precipitation (Myhre et al., 2019; Liu et al., 2022; Mcbride et al., 2022), it is expected that higher temperatures or precipitation may disrupt agricultural production, resulting in higher out-migration and, consequently, a lower net migration rate.

To capture broader socioeconomic and institutional influences on migration, the analysis includes Gross National Income per capita (GNI), Unemployment (UN), Remittances (REM), and Institutional Quality (IQ). GNI, measured in constant 2017 PPP dollars and sourced from UNDP (2024), reflects living standards. Generally, higher income is expected to reduce migration pressures, though it may also facilitate migration, especially from countries prone to corruption, crime, and political instability.

Unemployment (UN), measured as the total unemployment rate (% of the labor force) and sourced from the World Bank (2024), is expected to increase migration by constraining domestic job opportunities. Remittances (REM) are defined as personal remittances received as a percentage of GDP. It reflects existing migration networks that may ease local livelihood constraints or encourage migration through network effects. Its data are obtained from the World Bank (2023).

Institutional Quality (IQ) is measured by the World Bank's Worldwide Governance Indicators as an aggregate score of political stability and the absence of violence/terrorism, ranging from -2.5 (weak) to +2.5 (strong). Weak institutional quality can amplify the effects of climate variability and increase migration pressures, a particularly relevant concern in South Asia given its high levels of political instability and violence. Table 1 presents summary statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
NMR	132	-3.53	4.145	-13.522	6.412
TVAR	132	-2.63e-05	0.988	-2.597	2.37
PVAR	132	-2.36e-06	0.988	-3.344	2.383
AP	132	0.249	0.056	0.133	0.363
GNI	132	3399.545	1318.674	1515.347	6950.527
UN	128	6.011	3.668	0.398	13.157
REM	129	6.767	6.909	.743	27.626
IQ	108	-1.324	0.616	-2.81	-0.071
EDU	132	4.217	1.19	2.292	7.379

Notes: All variables are at levels

Table 1: Descriptive Statistics

Results and Discussion

We estimate the relationship between climate-induced net migration and the mediating role of agriculture using a 2SLS instrumental variable approach, based on fixed-effects, presented in Table 2, with related first-stage results, presented in Table 3. In Panel A of Table 2, the regression estimates are reported for six models (1 to 6), each adding more explanatory variables sequentially by controlling economic, social, institutional, and climatic factors.

The estimates reveal that Model (6) is the best choice because it provides the most comprehensive and robust estimation of the relationship between net migration rate (Log(NMR)) and its key determinants. Unlike models (1) to (5), model (6) includes all relevant independent variables, ensuring that the estimates are not biased due to omitted variables that are theoretically very important (e.g., remittances and institutional quality) to measure the net migration rate. Moreover, the inclusion of both country and year fixed effects further strengthens the model by accounting for unobserved heterogeneity. Overall, model (6) is the preferred specification as it balances explanatory power, statistical significance, and theoretical consistency.

The results of model (6) in Table 2 indicate that agricultural production (Log(AP)) has a positive and statistically significant effect on the net migration rate (Log(NMR)). This indicates a direct relationship between agricultural production and net migration rates. A reduction in agricultural production is likely to lead to out-migration, with more people leaving the country, resulting in lower net migration rates, assuming other factors remain constant. Therefore, when agricultural production is high due to favorable climatic conditions, there is likely to be less out-migration from the country, thereby increasing the net migration rate. Similarly, our results suggest that a reduction in agricultural production is associated with increased out-migration, resulting in a decrease in the net migration rate. Specifically, a 1% decrease in agricultural production (AP) results in a 7.048% decrease in the net migration rate (NMR) per 1,000 people.

As shown in Table 2, the other explanatory variables are also significant and provide interesting insights. Gross national income per capita (GNI) and unemployment (UN) both have significant negative effects on net migration. It implies that improved economic conditions and high income per capita facilitate migration from the South Asian region. Moreover, with a higher unemployment rate, people also tend to migrate to other places in search of better opportunities.

Panel A - Dependent Variable: Log of NMR						
	(1)	(2)	(3)	(4)	(5)	(6)
Log(AP)	5.815***	6.227**	6.401**	4.939*	6.726*	7.048*
	(1.887)	(2.671)	(2.951)	(2.647)	(3.808)	(3.746)
Log(GNI)		-0.392	-1.920	-2.661**	-3.661*	-4.083**
		(1.221)	(1.343)	(1.216)	(2.103)	(2.083)
Log(UN)			-0.493*	-0.820***	-0.487*	-0.577**
			(0.279)	(0.219)	(0.260)	(0.284)
Log(REM)				-0.301**	-0.358	-0.448*
				(0.139)	(0.256)	(0.271)
Log(IQ)					1.571***	1.548***
					(0.572)	(0.583)
Log(EDU)						-1.117
						(1.140)
Constant	10.151***	13.884	26.295*	29.157**	40.750*	46.242**
	(3.509)	(13.683)	(14.545)	(13.590)	(22.815)	(22.662)
Observations	132	132	128	126	108	108
R-squared	0.497	0.488	0.487	0.622	0.665	0.664
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel B - Diagnostic Tests of Instrumental Variables		
Weak Identification Test [a]	Kleibergen-Paap rk Wald F-statistic	3.960
Weak Instrument Robust Test [b]	Stock-Wright LM S statistic (Chi-sq)	9.08**
		(0.059)
Under-identification Test [c]	Kleibergen-Paap rk LM statistic	14.00***
		(0.007)
Overidentification Test [d]	Sargan-Hansen test	1.470
		(0.689)

Notes: *** p<0.01, ** p<0.05, * p<0.1, and hence indicate a significance level at 1%, 5%, and 10%, respectively. Robust standard errors are given in parentheses in Panel A, while P-values are in parentheses in Panel B. [a] The null hypothesis (Ho) is weakly identified, and it is rejected if the F-statistic is equal to or greater than 10, the critical value set by Stock et al. (2002). See also Stock and Yogo (2005). [b] Null Hypothesis: The joint significance of endogenous regressors is zero, i.e., B1 = 0, [c] Null Hypothesis: The equation is under-identified, meaning that the excluded instruments are irrelevant, [d] Null Hypothesis: The instruments are valid, which means they are uncorrelated with the error term.

Table 2: Second Stage Fixed Effects Regression Estimates (2SLS)

Similarly, remittances (Log(REM)) also show a negative association with net migration, indicating that greater financial support from abroad and a stronger social network facilitate out-migration, leading to a decrease in net migration.

Interestingly, institutional quality (IQ) is positively and significantly related to net migration, suggesting that better governance and institutions discourage out-migration by reducing barriers and increasing local opportunities. Furthermore, the estimates indicate that institutional quality has a more substantial driving effect on net migration than other socioeconomic indicators in South Asia. This finding underscores the importance of good governance, political stability, and effective institutions in shaping migration decisions, which are often lacking in this region.

Although education (EDU) is included in the model, its effect is not statistically significant. This may be due to the use of the education variable, which only captures the mean year of schooling without accounting for the quality, field, or specialization of education. Secondly, we relied on the mean year of schooling variable because there is a lack of available data on the number of specialized graduates and researchers across the countries considered. The absence of specialized education data can pose challenges for analyzing education-migration trends, as we lack detailed and comprehensive information on the number of individuals who have completed advanced or specialized education and the extent to which they are involved in research activities. Therefore, a more in-depth analysis of the motivations behind skilled and unskilled migration is necessary.

In summary, the model (6) suggests that in the context of South Asia, factors such as climate change, income, employment, remittances, and institutional quality play an important role in determining the net migration. Furthermore, the results also reveal that declining agricultural production, caused by climate variability, is one of the significant driving factors for net migration, followed by institutional quality.

Additionally, as shown in Table 3 (First Stage Regression Estimates), both temperature and precipitation variability have a statistically significant negative effect on agricultural production at the 5% level. However, agriculture appears to be more sensitive to temperature variability (0.055%) than to precipitation variability (0.014%). This decline in agricultural production leads to increased out-migration, resulting in a lower net migration rate. Our results align with prior empirical findings from other geographic regions, as presented by Marchiori et al. (2012), Cai et al. (2016), Falco et al. (2019), and Alessandrini et al. (2021).

Dependent Variable: Log of AP						
	(1)	(2)	(3)	(4)	(5)	(6)
Log(TVAR)	- 0.108***	-0.080***	-0.072***	-0.078***	-0.056**	-0.055**
	(0.021)	(0.018)	(0.021)	(0.021)	(0.021)	(0.021)
Log($TVAR^2$)	0.004	0.013	0.031	0.019	-0.004	-0.001
	(0.029)	(0.021)	(0.025)	(0.025)	(0.029)	(0.029)
Log(PVAR)	-0.017	-0.017*	-0.019**	-0.020**	-0.014**	-0.014 **
	(0.013)	(0.009)	(0.009)	(0.009)	(0.007)	(0.007)
Log($PVAR^2$)	-0.029	-0.027	-0.024	-0.018	-0.003	-0.001
	(0.019)	(0.017)	(0.017)	(0.015)	(0.011)	(0.011)
Log(GNI)		0.300***	0.190**	0.276***	0.393***	0.410***
		(0.053)	(0.072)	(0.064)	(0.078)	(0.081)
Log(UN)			-0.050***	-0.033**	-0.030*	-0.024
			(0.017)	(0.015)	(0.017)	(0.018)
Log(REM)				0.041***	0.057***	0.062***
				(0.009)	(0.008)	(0.010)
Log(IQ)					-0.004	-0.002
					(0.037)	(0.037)
Log(EDU)						0.082
						(0.090)
Constant	-1.901***	-4.154***	-2.902***	-3.755***	-4.803***	-5.13***
	(0.038)	(0.401)	(0.648)	(0.569)	(0.694)	(0.784)
Observations	132	132	128	126	108	108
R-squared	0.948	0.963	0.965	0.972	0.979	0.979
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: *** p<0.01, ** p<0.05, * p<0.1, and hence indicate a significance level at 1%, 5%, and 10%, respectively. Robust standard errors are given in parentheses.

Table 3: First Stage Fixed Effects Regression Estimates (2SLS)

The diagnostic tests for the validity of instrumental variables for the estimation of the 2SLS model used in Model (6) are presented in Panel B of Table 2. The Kleibergen-Paap rk Wald F-statistic of 3.960 falls below the critical threshold of 10, suggesting the presence of weak instruments. However, the Stock-Wright LM S-statistic is significant at the 10% level (p = 0.059), which provides strong enough evidence to reject the null hypothesis of weak instruments.

On the other hand, the Kleibergen-Paap rk LM statistic for the under-identification test is statistically significant at a 1% level ($p = 0.007$), indicating that the model is identified and the excluded instruments are relevant. Additionally, the Sargan-Hansen overidentification test yields an insignificant result ($p = 0.689$), accepting the null hypothesis of a valid instrument. This suggests that the instruments are valid and uncorrelated with the error term.

Overall, while the instruments meet the criteria for identification and validity, their weakness in terms of explanatory power is probably due to the low quality of climate and agricultural data in developing countries (Falco et al., 2019). To overcome this problem and assess the robustness of 2SLS estimates, we examined the sensitivity of our results using the Limited Information Maximum Likelihood (LIML) method as suggested in the literature (Stock & Yogo, 2005; Angrist & Pischke, 2009; Falco et al., 2019). The outcomes of this method, available upon request, show consistent robust results with coefficients having the same sign and closer to those found through the 2SLS instrumental variable approach.

Conclusions

This study is motivated by the fact that South Asia, and particularly countries such as Bangladesh, India, Nepal, and Pakistan, are mostly vulnerable to the effects of climate change, resulting in negative impacts on agricultural production and triggering mass outmigration. The key focus is to investigate whether out-migration can serve as a survival strategy, depending on the severity of the climate impacts on agriculture.

Several empirical studies have found a causal link between climate change and migration, emphasizing the mediating role of agriculture in influencing migration. However, most studies have used 5-yearly and decadal data for bilateral migration, as well as long-term average temperature and precipitation data, which overlooks short-term fluctuations. To overcome these limitations and with the aim to analyze how climate change influences agricultural production, and consequently, affect migration, we used the yearly net migration data, which helps to provide a more detailed analysis by capturing short-term effects and immediate responses to changes in climatic conditions.

We found strong empirical evidence supporting the hypothesis showing that climate variability, measured by variations in temperature and precipitation, has a significant negative impact on agricultural production. In turn, climate-induced reduction in agricultural production leads to a

decrease in the net migration rate, resulting in more out-migration. Additionally, the results show that other factors, such as income, employment, remittances, and institutional quality, play an important role in defining migration flows, while education is not detected as a decisive factor. Overall, the study suggests that in regions where agriculture remains the primary source of livelihood, such as South Asian countries, climate-driven declines in agriculture are the main factor influencing net migration, followed by institutional quality.

Thus, in the light of the findings, policy intervention is needed to enhance agricultural resilience to increasing climate variability through the introduction of climate-resilient crop varieties, sustainable farming practices, early warning systems, and the development of flood-control infrastructure, among other policies, to mitigate climate-induced migration. In addition, particular attention should be given to institutional enforcement, the establishment of good governance, and the achievement of political stability, which are lacking in the countries under investigation, leading to intensified migration as a survival strategy that contrasts with the climate change impacts in South Asia.

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PACKED WITH SILENCE: ARAB MINORITY EMPLOYEES IN MIXED ISRAELI ORGANISATIONS

Abboud Armaly, Oriana[1]; Kidron, Aviv[2]

[1,2]Department of MA Studies in Organisational Development and Consulting,
Max Stern Yezreel Valley College, Afula, Israel

Keywords: Diversity, Identity Safety, Self-Silencing, Workplace Dynamics

Introduction

This study examines self-silencing among Arab minority employees in mixed organisations in Israel and seeks to identify underlying factors of self-silencing in mixed organisation dynamics as natural spaces of encounter. Drawing on social identity theory (Tajfel, 1981), identity and safety frameworks (Steele, 1997) and self-silencing theory (Dobai and Hopkins, 2022), it captures self-silencing as a complex social phenomenon in organisational settings, highlighting how organisational conditions (e.g., language policy, cultural stereotypes, recognition initiatives) shape this experience. The study is significant in framing self-silencing not only as interpersonal harmony-seeking, but also as a survival mechanism in majority-controlled organisational spaces, where threats may determine self-silencing or self-expression at work among minority employees.

Purpose, Aim and Objectives

This study examines self-silencing experiences among Arab minority employees in mixed organisations in Israel by identifying the underlying factors shaping self-silencing and uncovering how organisational conditions shape dynamics of identity threat versus identity safety.

Literature Review and Theoretical Framework

According to social identity theory, an individual's sense of self is shaped by awareness of belonging to social groups and the emotional significance attached to that membership (Tajfel, 1981). Self-silencing in minority groups is collectively rooted and goes beyond individual coping (Dobai and Hopkins, 2022). It is shaped by cultural narratives that valorise dominant identities while marginalising minority voices and is reinforced through institutional

socialisation in workplaces and social structures. This dynamic is particularly evident in mixed organisations, where Arab minority employees navigate structurally unequal intergroup relations within shared work environments. In these contexts, social identity threat operates through fear of confirming stereotypes, shaping self-silencing as a personal and collective response (Steele, 1997).

Methodology

We employed a qualitative approach grounded in grounded theory (Charmaz, 2006). Thirty Arab employees in mixed organisations across industry, service and high-tech sectors were purposively sampled with intentional variance. Data were collected via semi-structured, in-depth interviews and analysed using thematic content analysis to identify shared narratives and uncover the self-silencing phenomenon (Berg, 2001).

Findings

The findings present the mixed organisational environment through two dimensions: policies and dynamics. At the formal level, language policy restricts use of Arabic, creating unequal silencing of ethnic identity, since Arabic is perceived as a threat in the Israeli organisational context. Dynamics within the organisational space are characterised by limited familiarity with Arab society, expressed through stereotypes and non-recognition of the structural barriers shaping Arab employees' daily lives. This adds a burden of navigating stereotypes within the shared organisational space. This is further intensified when intergroup tensions in Israeli society are mirrored in the workplace, driving Arab employees to silence themselves regarding political issues they perceive as endangering their job security. However, another finding indicates that in organisational environments that foster belonging and equality, identity safety moderates self-silencing and minority status tends to recede.

Originality and Value

This study makes three main contributions to understanding self-silencing: It proposes self-silencing as a systematic threat assessment rather than a response; The findings highlight organisational conditions within asymmetric ethnic power relations; It extends self-silencing theory beyond interpersonal relationships, presenting self-silencing as a survival strategy for minorities within majority-controlled organisational spaces.

Research Limitations

As the study focused on the Arab minority, future research across diverse groups is needed to enhance our understanding of this phenomenon. Also, it was conducted before and during the Swords of Iron War, which may have influenced the results and was not explicitly examined.

Theoretical and Practical Implications

Theoretically, the study argues that self-silencing is best understood as a complex organisational phenomenon shaped by identity threat versus identity safety within asymmetric ethnic power relations, rather than only an interpersonal strategy to preserve relationships. Moving towards a global norm of mixed workplaces, these findings challenge diversity frameworks to recognise how identity threat and power relations shape minority voice and silence in everyday organisational encounters, moving beyond representation.

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DO SIN FIRMS ENGAGE IN IMPRESSION MANAGEMENT THROUGH ESG COMMUNICATION? EVIDENCE FROM X

Liaras, Evangelos[1]; Nerantzidis, Michail[1]; Panagiotou, Nikolaos[1]

[1]University of Thessaly, Department of Accounting and Finance

Keywords: Organizational Stigmatization, ESG, Sin Firms, Impression Management, Readability, Social media, Twitter

Managers often employ ESG communications on social media platforms to shape stakeholder perceptions (Araujo & Kollat, 2018) and signal the firm's commitment to sustainability (Balasubramanian et al., 2020). While the use of ESG posts as a strategic tool in the investment process has been substantially discussed in the literature, no prior research has examined its effectiveness for firms operating in controversial industries. Thus, our goal is to explore how less reputable firms, commonly referred to as sin firms, use ESG communications on digital platforms.

We focus on the tobacco, gambling, alcohol, and firearms industries, which paradoxically employ the rhetoric of sustainability and responsibility in their corporate communications. This occurs even though their core products are widely perceived as ethically questionable (Zerbib, 2022). Managers of sin firms may be motivated to engage in impression management to alleviate pressure and mislead investors about the firm's actual ESG performance (Berkin et al., 2025), particularly as assurance of ESG information stands at a crossroads (Gipper et al., 2024). Social media, as a direct means of communication, can be a powerful tool for stakeholder engagement, enabling firms to promote ESG information.

Against this background, we examine whether ESG posts on social media serve as a channel for impression management. We focus on a global sample of 190 publicly traded sin firms managing at least one active X account between 2008 and 2024 to analyze the readability of their tweets. Specifically, we compare 137,000 ESG and non-ESG posts to identify potential differences in comprehensibility between the two groups. We further assess the influence of ESG tweet readability on stakeholder engagement and investigate the relationship between tweet readability and financial performance. Our results, supported by regression and Random

Forest models, suggest that sin firms' managers post symbolic ESG tweets to alleviate stigma. Compared with ESG tweets, posts unrelated to ESG topics are, on average, more readable as measured by the Dale-Chall readability formula. Among ESG tweets, higher readability, a greater number of "at" mentions, and the inclusion of images are positively associated with user engagement. However, more readable ESG content on social media does not seem to produce financial benefits for sin firms.

Those results are consistent with organizational stigma literature, which emphasizes the impact of stigmatization on controversial firms. Given the negative perceptions surrounding these firms, managers strive to leverage the rising demand for ESG communications and the expansive reach of social media to numerous stakeholders as a defensive mechanism against stigmatization penalties. Rather than risk making false claims that can be quickly discovered and punished (Yannopoulou et al., 2024), they may leverage the lack of regulatory readability standards to engage in "cheap talk" that is difficult to scrutinize. We note, however, that this practice fails to materialize into financial gains.

Our study makes several contributions to the impression management, social media, and readability literature. We extend existing impression management research by demonstrating the use of ESG communication on social media as a strategic tool to alleviate sin firms' organizational stigma. We also enrich social media and readability literature by examining the impact of ESG post clarity on stakeholder engagement. In addition, we examine further drivers of stakeholder engagement, specific to the X platform. Finally, we shed light on the relationship between ESG communication and financial outcomes.

We acknowledge that this study is restricted to X, whereas firms commonly use multiple digital communication channels. Moreover, future research could compare the readability of posts across stigmatized and other industries, enriching the current understanding of the strategic role of ESG communication.

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THE SILENT SABOTEUR: WORKPLACE MOBBING AS THE HIDDEN ENEMY OF STRATEGIC DECISION-MAKING IN HEALTHCARE ORGANISATIONS

G.Yazgı Tütüncü[1], Athina Vasilaki[2], Christina Syrgkani[3]

[1]Izmir University of Economics, Department of Mathematics, Izmir, Turk

[2]International Hellenic University, Department of Management of Organisations, Marketing and Tourism, Thessaloniki, Greece

[3]Social Worker, Athens, Greece

Keywords: strategic decision-making, mobbing, healthcare management, leadership

Abstract

Workplace mobbing defined as the emotional abuse of an employee through rumors, humiliation and intimidation aimed at forcing voluntary resignation (Davenport *et al*, 1999; Resch and Schubinski, 1996) has been extensively linked to stress, burnout, depression and turnover (Nielsen and Einarsen, 2012). The consequences of such behaviors and reactions in the workplace environment are disadvantageous to the service provided, hence, damaging the quality of interpersonal relationships and directly affecting the patient care provision. Yet, its effect on strategic decision-making remains largely unexplored. Strategic decisions such as resource allocation, service provision and expansion, collaborations and partnerships, workforce development as well as cost management are central to organisation performance and patient outcomes (Matthiesen and Einarsen, 2010). High quality decision-making requires open communication, mutual respect, and a mobbing climate suppresses employee initiative, discourages reporting of critical information and erodes collective problem-solving, replacing critical thinking with fear and conformity (Dickson and Isaiah, 2024; Garvey and Mackenzie, 2024).

This study addresses this gap by investigating how mobbing affects strategic decision-making in units that focus on mental health service provision, a context marked by staff shortages,

insufficient funding and political inference that make it particularly susceptible to mobbing (Grim and Markstrom, 2024). Therefore, the goal of this study is to investigate how mobbing is manifested in the mental health care services and in return how this affects the strategic decision-making processes of the service. Further, we investigate which stage of strategic decision-making is most affected by mobbing and what managerial strategies can mitigate mobbing's impact on decision-quality.

This study employs qualitative research paradigm and structured interviews as it explores the conditions under which the effects of workplace mobbing are mitigated or amplified and whether they lead to impaired decision-making. The choice of qualitative research for this study will allow us to fully explore emerging phenomena experienced by individuals by giving voice to the participants (Dunwoodie *et al*, 2023). Structured interviews will enable us to investigate how participants give meaning and interpret the phenomenon of workplace mobbing and will allow us to draw more comprehensive and actionable insights (Halbesleben, 2011).

Finally, this study aims to provide both theoretical contributions and practical recommendations offering insights into the mechanisms through which toxic interpersonal behavior influences high-stake decision-making in healthcare settings. It contributes to the literature of workplace mobbing in the public sector but also advances the literature on decision-making by highlighting obstacles that should be removed to facilitate this process. The results of this study aim to increase awareness about mobbing in public sector health services and its effect on organisational performance and offer new informed avenues of tackling this phenomenon.

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EVOLVING ECOSYSTEMS: THE HYBRID ROLE OF AI HUBS

Fiorini, Niccolò [1]

[1] Department of Business and Law, University of Siena, Siena, Italy

Keywords: Artificial Intelligence, Innovation Ecosystems, Hybrid Organisations, Knowledge-Intensive Systems.

Introduction

The expansion of artificial intelligence (AI) is changing global competitive dynamics, affecting both large companies and SMEs (Vrontis *et al.,* 2023). However, this transition is not purely technological: the main challenge lies in having the interpretative skills necessary to effectively integrate AI into business processes (Bounatirou and Lim, 2020). As a result, the barriers are primarily cognitive and organizational and remain underexplored in literature. Despite the growing attention to the cognitive and organizational barriers to the adoption of AI, the role of intermediary actors in supporting companies in interpreting the opportunities offered by AI and translating them into their respective organizational contexts still remains poorly understood.

Purpose, Aim and Objectives

This study analyses how properly designed hubs facilitate the assimilation and diffusion of artificial intelligence among companies, institutions and society. Focusing on the early stages of AI hub development, the study examines how its role as an intermediary emerges and develops in an effort to reduce uncertainty, foster understanding of AI opportunities, and support capacity building within territorial innovation ecosystems.

Literature Review and Theoretical Framework

Much of the traditional literature on AI adoption focuses on organizational readiness and technical capital, while recent studies suggest that the most critical barriers are cognitive in nature. Companies are struggling to frame the potential of AI within their strategic and operational boundaries. On the innovation ecosystem front, they describe value creation as a relational and distributed process among heterogeneous participants (Yaghmaie and Vanhaverbeke, 2020). In this context, intermediaries can no longer be seen as simple knowledge brokers or connectors between supply and demand, since in contexts of high

uncertainty these roles prove to be insufficient. The literature on innovation intermediaries has traditionally attributed to these actors functions of connection, knowledge transfer, facilitation and coordination between different subjects in the ecosystem (Crupi et al., 2020; Battistella et al., 2023). In conditions characterized by high technological uncertainty, however, these functions may not be sufficient. In the case of AI, intermediation may also require the construction of a shared understanding of technology, the alignment of different expectations and the ability to relate resources, skills and needs that are not yet fully defined (Jacobides et al., 2021). This study therefore aims to conceptualize AI hubs as hybrid intermediaries operating through interpretive alignment and resource orchestration.

Methodology and Methods

This study takes a qualitative exploratory approach based on a single longitudinal case study (with data collected in 2025, 2026 and still ongoing) of *Fondazione SAIHub,* an AI hub within a knowledge-intensive territorial district. The case is particularly suitable for observing the formation of an innovation intermediary in its early stages of development and the ways in which it progressively builds its role within the ecosystem. The analysis, launched in 2025, combines documents, in-depth interviews, stakeholder observations, and focus groups, allowing for a process-oriented understanding of the organization's evolution over time.

Findings and Contribution

The results collected so far reveal that, during the initial period, the hub did not function as a provider of "ready-to-use" technical solutions. On the contrary, a substantial part of its activity is dedicated to the construction of a shared cognitive base and the involvement of a base of companies, institutions and the territory. The hub aims to make AI understandable to different actors, thus reducing the instability associated with its adoption and promoting informed adoption even for those who have already partially implemented it. In addition, the organization promotes the development of local capacities through the collaborative co-production of knowledge rather than through direct and univocal transfer. Another pillar concerns relational orchestration: the hub aligns the expectations of companies, the output of research centres and institutions, filling the existing interpretative gaps both on their part and on the part of the ecosystem in general. Finally, the analysis highlights a process of organizational hybridization in which institutional and entrepreneurial logics progressively converge. Considered jointly, these results suggest that the value of the AI hub lies not

primarily in the direct provision of technological solutions, but in the ability to create the cognitive, relational and organizational conditions that make their informed adoption possible. The role of the intermediary therefore takes on a hybrid nature, combining functions traditionally associated with knowledge mediation with cognitive alignment, capacity building and ecosystem orchestration activities.

Originality and Value

The research proposes a paradigm shift in the way innovation intermediaries are involved within the AI domain. Going beyond the vision of the intermediary as a purely technical facilitator and proposer of specific innovative solutions, the data underlines the importance of the cognitive dimension of intermediation. This perspective offers a more nuanced understanding of how disruptive technologies are metabolized and integrated within organizational environments, especially during transition phases characterized by high uncertainty, such as the current one.

Research Limitations

The main limitations of the study lie in being a single qualitative case and in its being in the embryonic stages of organizational maturity, with fluid and evolutionary processes. This precludes its generalization and study of consolidated institutional models. In addition, the qualitative methodology presents potential biases, however mitigated by triangulation.

Theoretical and Practical Implications

From a theoretical point of view, this research suggests an extension of the current intermediate frameworks of innovation, supporting the formal integration of a "cognitive dimension" alongside traditional pillars such as knowledge transfer and network mediation, with the aim of better grasping the complexities of AI adoption. In contexts characterized by high technological uncertainty, in fact, the intermediary does not limit itself to transferring or connecting already defined resources but contributes to the very construction of the actors' ability to interpret the technology, identify its possible applications and formulate needs and expectations. On a managerial and policy level, the results suggest that the design and evaluation of AI hubs should not focus exclusively on the availability of infrastructure, technical skills or technological services. Their ability to develop interpretative skills among

actors, facilitate shared learning processes and coordinate needs and resources distributed in the ecosystem should also be considered.

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