

# Virtual relational capital for business development: a case study

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## Abstract

**Purpose** – The study aims to investigate virtual relational capital (VRC) to evaluate to what extent virtual relations (VR), obtained by using new technologies, support the development of firms, also considering the increasing sustainability's needs. The study addresses the literature gap on VRC dynamics through an empirical analysis.

**Design/methodology/approach** – The investigation focuses on a single case study in the lighting industry, deepening the case of a small Italian company. The case is analyzed through the lens of the CAOS framework model by Paoloni, nurtured through direct semi-structured interviews with the entrepreneur and some managers and consultants, and data collected via web scraping.

**Findings** – VRC, obtained by the use of new technological tools, contributes to developing and fostering the innovation ecosystem in which companies need to create new skills and synergic alliances with other stakeholders. Moreover, VR can improve commercial and sales performance, stakeholder engagement and sustainability, including alignment with the circular economy and waste management principles. VRC can support smaller companies with more limited resources to connect to a broader range of actors, raising their voices with policymakers and other relevant international institutions.

**Originality/value** – The study contributes to the theoretical understanding of VRC, especially in an era in which new technologies play a fundamental role for both businesses and people. It also provides practical insights into how companies, especially smaller ones, can maximize their sustainable impact by strategically adopting virtual interactions with meaningful stakeholders like customers, key executive partners, industrial associations and policymakers.

**Keywords** Virtual CAOS, Virtual relational capital, Relational capital, CAOS model, Case study, Intellectual capital

**Paper type** Case study

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## Introduction

Intellectual Capital (IC) is defined as the knowledge resources possessed by a company, such as know-how, patents and reputation (Edvinsson and Malone, 1997). It was described as an essential resource to drive the performance of organizations (Edvinsson *et al.*, 2022).

Relational Capital (RC) represents one of the three main pillars of IC, along with structural and human capital, and it summarizes the relations between companies and the external environment and/or with stakeholders (Bontis, 2004; Freeman, 1984; Morais and Silvestre, 2018). Whereas human and structural capital are internal to a company, RC covers an organization's dealings with its external environment (Bontis, 1998). It integrates knowledge about relationships with the organization's external partners, stabilizes the environment and makes it accessible to the firm (Mouritsen, 2006). RC includes the revenue-generating aspects of the organization as, for example, branding, reputation, strategic alliances and relationships with other value chain members (Bagnoli *et al.*, 2020; Paoloni and Modaffari, 2022). It covers all the intangible assets generated by developing, maintaining and nurturing high-quality relationships with external partners that could enhance the firm's performance (Zamboni *et al.*, 2024).

Such aspects are particularly critical in smaller organizations (Massaro *et al.*, 2016b). Small and medium enterprises (SMEs), in particular, depend on RC to enhance their internal capacity to innovate (Durst *et al.*, 2024). The current literature demonstrates that the degree to which an organization can search, acquire, assimilate and integrate external knowledge stands as a critical factor in enhancing RC and, as a result, boosting innovation capability (Roxas and Chadee, 2016). In particular, smaller businesses need to foster the ability to access knowledge that extends beyond the organization's boundaries (Massaro *et al.*, 2019; Taghizadeh *et al.*, 2021).

The current context and the way organizations manage their IC are still influenced by the middle-term effects of the COVID-19 pandemic (WHO, 2020), which has impacted the entire economic and social apparatus, creating destabilization and repercussions worldwide. First of all, most companies had to readapt their everyday life to cope with this extraordinary and unexpected event, to limit the side effects of the pandemic by ensuring survival and trying to act promptly to face the emergency. Firms active in several different business fields had to profoundly rethink their business models to cope with the new regulatory constraints, new ways of working and new consumer habits, including a more significant use of technologies and online resources (Bagnoli *et al.*, 2021).

Indeed, modern technologies, such as social media, Information and Communication Technologies and overall digitalization practices (Borcsa and Pomini, 2017), have changed the way companies manage their business processes, leading to the implementation of new business models (Bagnoli *et al.*, 2018; Biloslavo *et al.*, 2018, 2020). Such technologies can create unique opportunities to implement networks of virtual connections through which to generate new opportunities for RC and overcome geographical barriers, thus giving rise to new trends and favoring digital transformation (Mignenan, 2022; Paoloni *et al.*, 2023). Such virtual relations (VR) lead to a virtual relational capital (VRC), which is a starting point to promote trust and awareness, enhancing the brand, corporate image, reputation, customer satisfaction and loyalty marketing (Paoloni, 2021; Zamboni *et al.*, 2024). VRC can also favor the definition of corporate strategies aimed at generating and creating value following the increasing call for sustainability (Edvinsson *et al.*, 2022; Massaro *et al.*, 2018). The rise of new technologies, along with their growing use, also pushed by the recent pandemic, has led to the need to adopt a revolutionary approach to business that, starting from RC, has radically changed how knowledge is shared, creating value for all stakeholders involved and

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redesigning the relationships between people and organizations (Bellis *et al.*, 2022; Durst, 2024).

Starting from these premises, the article aims to deepen the topic of VRC for business development, also in light of the post-pandemic scenario. A review of the literature is followed by the analysis of a case study to address our research question (RQ):

- RQ. What is the potential role of VRC in disrupting and supporting business development, considering virtual tools and the increasing interest in sustainability issues?

The study aims to address the lack of concrete evidence in the application of VRC in businesses, investigate the practical role of VRC in business development and consider the role played by sustainability and new technologies.

The study is structured as follows. The next section is devoted to a review of the most recent literature on the topic. The following chapter describes the approach adopted before deepening the main evidence identified. The discussion highlights critical data analysis and supports the answers to the research question. The last paragraph underlines the practice, research and policy implications that may derive from the investigation.

## Literature background

The topic of VRC is widely debated among academics. Technological innovation (de Bem Machado *et al.*, 2021; Cavazza, Dal Mas, Paoloni, *et al.*, 2023; Paoloni *et al.*, 2022; Zamboni *et al.*, 2024), in addition to the increasingly widespread topics of sustainability applied to them (Biloslavo *et al.*, 2020; Centobelli *et al.*, 2020; Edvinsson *et al.*, 2022), has led several scholars to engage in the study of these issues and how they are revolutionizing the economic and social structure.

Regarding IC, new technologies are able to create value and competitive advantage, facilitating knowledge exchange and spurring innovation (Secundo *et al.*, 2019). RC, composed of internal and external, vertical and horizontal company relations, gains valuable insights into improvements to new technologies (Sáenz *et al.*, 2024).

A recent structured literature review (Massaro *et al.*, 2016a) focused on VRC (Zamboni *et al.*, 2024) highlights how the current VRC literature is not contextualized in a specific geographical area. This aspect reflects the need to expand research on an international level to integrate, through pragmatic and not only theoretical points of view, studies on innovative and technological solutions referred to RC and real experiences of using the same technologies in various types of business contexts. The culture, the way of thinking and the political-institutional structure of a country, in fact, significantly affect the solutions adopted by the territorial business realities (Marti and Puertas, 2023) to offer cutting-edge solutions and contribute to the economic and social evolution, not only on a national but also on an international basis and, above all, outside the borders of a specific country (Zamboni *et al.*, 2024).

Previous studies on VRC touched a variety of different business fields, including the wine industry (Paoloni and Cosentino, 2021), cosmetics (Sutanto, 2013), job market and human resource management (Liu and Wang, 2007), start-ups (Paoloni and Modaffari, 2022), healthcare (Biancone *et al.*, 2021; Cobianchi *et al.*, 2021), education and learning (Cegarra-Sánchez *et al.*, 2018; Muliadi *et al.*, 2024) and social networks (Lu and Yang, 2011; Massaro *et al.*, 2021; Suti and Sari, 2023). The VRC literature outlines some recommended strategies. Several research works advocate using innovative virtual solutions to promote social capital (Muliadi *et al.*, 2024; Sutanto, 2013; Suti and Sari, 2023). An example is given by the increasing development of social media, which positively affects brand reputation and

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knowledge, and conceptualizes a new phenomenon called Brand Social Capital (Zarei *et al.*, 2024). Social capital is defined as a solid predictor of team efficacy and team performance (Chang *et al.*, 2018; Rezaei *et al.*, 2020; Schenkel and Garrison, 2009; Yetis Larsson *et al.*, 2019; Zornoza *et al.*, 2009). In addition, innovative technologies are believed to influence the perception of social capital (Caputa *et al.*, 2021), which in turn affects knowledge integration (Robert *et al.*, 2008). An example of VRC able to increase the overall organizational effectiveness is the online learning communities case. In this context, the use of VR and knowledge sharing is able to create RC, clarify misunderstandings and prevent counter-knowledge learned from inadequately informed sources (Cegarra-Sánchez *et al.*, 2018).

A collaboration between academics and practitioners could help shift what has been theorized at the research level to a more concrete level, showing empirical evidence to support the analysis carried out (Massaro *et al.*, 2018). This same approach could be facilitated by research methods that prefer case studies (Cosentino *et al.*, 2020) and interviews (Cavazza, Dal Mas, Campora, *et al.*, 2023; Dal Mas *et al.*, 2022; Sanz-Blas *et al.*, 2021) to collect information on companies that adopt disruptive and efficient solutions to keep up with new technological trends and offer sound ideas to implement research and development (R&D) of corporate processes.

While some scholars have devoted considerable attention to the relationship between IC and business performance, most of them do not consider the moderating effect of the environmental impact (Ling, 2012). Sustainability is not only a trend but a development line in the actual competitive context, which directly impacts the company's business model, processes, products and the territory and communities where companies operate (Biloslavo *et al.*, 2018; Fait *et al.*, 2020). This has been exacerbated by the launch of the United Nations Sustainable Development Goals (SDG's) 2030 agenda (United Nations, 2015). IC and knowledge management are strictly connected, and, when it comes to their direct contribution to sustainable practices, they can be merged into the Green Knowledge Management concept, which can lead to competitive advantage and a critical factor for the business's sustainable development (Ulhaq *et al.*, 2024). In this direction, IC and VRC are considered an essential link between support needs and development needs to fulfill the SDG's and obtain a sustainable competitive advantage (Massaro *et al.*, 2018; Paoloni *et al.*, 2023).

In the actual economic environment, firms are highly influenced and impacted by fast and sudden technological changes, and they are pushed to pivot continuously to products, services and sometimes the company's entire business. In this context, IC and knowledge management can reinforce each other, playing a fundamental role in achieving efficiency and effectiveness, especially for companies like SMEs (Giampaoli *et al.*, 2024). Within the business world, the advent of Industry 4.0 and technologies such as the blockchain, Internet of Things (IoT) and Artificial Intelligence (AI) have led VRC to become a core function, fundamental within the new competitive context based on trust, information exchange and cross-integration between customers and suppliers (Schmidt *et al.*, 2023). This underlines how VRC promotes and develops value creation in several organizational areas, from business development to supply chain management, with internal and external relations.

Despite the increasing number of published studies, there still appear to be some gaps in the academic literature. First of all, despite the growing body of literature, there is a lack of concrete evidence in the application of VRC in businesses, which, instead, should deserve more attention from scholars and practitioners. Moreover, there seems to be a need to investigate the role of VRC as a trigger for sustainable business development, inspiring regulations to support the constant evolution of businesses in the future while giving the tools to overcome adverse situations. Starting from these premises, the paper aims to fill the gaps

between theoretical and practical considerations by analyzing a single case study in depth to offer points of reflection to the academic and practice community.

## **Methodology**

### *Research aims*

The research applies a qualitative methodology based on semi-structured interviews in a single case study to highlight the fundamental role of VR woven by companies with external subjects who define their value and the possibility of growing over time. An analysis appropriate to the technique of open questioning cannot interpret and summarize the material according to a pre-determined catalog of topics; this can only be partially designed before the data are collected (Magaldi and Berler, 2020). The benefit of the semi-structured interview is that it permits discussions to be focused while still giving the investigator the autonomy to explore pertinent ideas that may come up during the interview (Cavazza, Dal Mas, Campra, et al., 2023).

### *Research theoretical framework*

To answer the research question, the CAOS model (Paoloni, 2021) was used as a sound framework to deeply describe the company business model, particularly the RC role in business development, as suggested by the most recent literature (Cosentino et al., 2020; Dal Mas and Paoloni, 2019; Mercuri et al., 2021; Paoloni et al., 2022; Paoloni and Modaffari, 2022). The CAOS model highlights the personal characteristics of the entrepreneur (namely the “C” factor), the environment/ambiance in which the company operates (the “A” element), the organizational and managerial aspects (the “O”) and, finally, it underlines the sustainability’s role within the company business model (the “S”) (Paoloni, 2021).

The personal characteristics of the entrepreneur (C) highlight mainly the management style and the business vision, focusing on the motivations that push the entrepreneur to support the business (Dal Mas and Paoloni, 2019). The ambiance (A) focuses on the solid interdependence relationship between the company and the socio-economic cultural context in which the venture is positioned. The environment and the territory influence the company’s interactions with the other subjects (Paoloni et al., 2022). The organizational and managerial aspects (O) underline the assignment of roles and responsibilities within the company, including the operational and managerial procedures (Cosentino et al., 2020). The sustainability role’s in the business model (S) explains a set of projects and initiatives developed by the firm to innovate and increase the company’s sustainability as a driver of success (Mercuri et al., 2021).

### *Research context and the choice of the single case*

The analyzed company is WayPoint [1], a dynamic and innovative firm focusing on the R&D of new lighting products. Starting from an early age, Alberto Baesso learned how to think and create like a proper craftsman, one of the wealthiest and most prolific Italian heritage. In 2000, together with his son Philippe, they founded WayPoint, looking to adapt the needs of large distributors to a philosophy driven by product and design process that follows the footprints of ancient workshops. The name WayPoint indicates a place whose geographical coordinates are recorded in the memory of a satellite navigator or GPS. This name was chosen precisely to recall a guide in the route of the company’s stakeholders.

The company operates in the interior lighting sector, collaborating with several retail players and boutiques in Italy, Europe and worldwide with the purpose of exporting the “Made in Italy” philosophy anywhere in the world. WayPoint represents a practical example of how new emerging technologies can support the creation of VRs with any type of

stakeholder, overcoming the communication bottlenecks that a SME can experience. WayPoint collaborates with young and emerging designers who provide a wide range of design solutions able to satisfy most of the market needs through high-quality standards, professional expertise, continuous R&D activities, product innovation and 100% Italian products. The company handles all stages of production in-house, adopting different processing techniques according to specific customer requirements, from the glassmaking and painting facilities to the logistics and manufacturing/assembly line. Today WayPoint owns six brands with different features: from design lighting to mass market lighting, in addition to technical and architectural lighting, retro and vintage lighting, classic and elegant lighting and, finally, simple line lighting. The company promotes innovation and research with a forward-looking perspective but is always aware of its identity, making WayPoint try to integrate tradition daily with technological innovation.

#### *Data collection and analysis*

A research protocol was established to design the data collection and analysis, to ensure reliability and validity and to be consistent with the primary literature in the field. The research phases follow the logical process described by [Howard and Peters \(1990\)](#), which also explains the appropriateness of the sources used in this study.

First, the analysis focused on the company's website, and scrapped the web to gather additional information about the firm and its development (including videos on YouTube, articles in magazines and online newspapers). Data collected online were first analyzed to better understand the company's storytelling. Such kind of information helped the authors prepare a customized and more efficient questionnaire considering the company's context and history.

Then, a semi-structured questionnaire was designed. The research team concentrated on the primary literature to be taken into account in selecting the topics to be investigated and, thus, the questions to be formulated to guide the interviewees. The approach is particularly appropriate for analyzing innovation within corporate contexts ([Zhuang, 1995](#)).

[Table 1](#) illustrates the seven semi-structured interview questions. For each question, the eventual references from the academic literature are provided, and some of these are then combined with a potential response that participants could have delivered according to the current academic debate. Interviews based on semi-structured questionnaires support exploratory, descriptive analysis and a greater interpretative capacity ([Lefley, 2016](#)).

Six people in the company's ecosystem were interviewed, including the founder and current innovation manager, Mr Alberto Baesso, the WayPoint's representative in the international association LightingEurope and four company consultants linked to the Ca' Foscari University of Venice (the scientific director, a scientific supervisor and two junior strategists). The interviews took place remotely via telephone and video call connections and lasted 30 min to 1 h. All of them were recorded and transcribed, and their main findings were coded. Participants had access to the interviews' results to check their validity. Early results were also presented and discussed with Mr Baesso, the scientific supervisor and two junior strategists, together with a master's degree class and some PhD students at the Sapienza University of Rome. After the first drafting of the article, one more round of interviews was conducted with the aim of continuously updating the data collection process and the company's efforts in this field.

#### **Findings**

The following section reports the results gathered from the semi-structured interviews using the CAOS framework model ([Paoloni, 2021](#)).

**Table 1.** A Summary of the research protocol and semi-structured interview questions

Interview question	Reference(s)
1. How and to what extent is relational capital influencing your way of doing business?	Yetus Larsson <i>et al.</i> (2019)
2. What kind of solutions are you implementing to be aligned with the United Nation's SDGs?	United Nations (2015)
3. What types of disruptive strategies/solutions have been adopted to increase efficiency and sustainability?	Massaro <i>et al.</i> (2018)
4. How much does the territory (i.e culture and way of thinking) affect the level of development of relationships and technology? What regulatory support could the state/authority give in this regard?	Chang <i>et al.</i> (2018)
5. How did you develop organizational procedures to promote relational capital? What are the key roles in the company that are responsible for the decision-making processes?	Zamboni <i>et al.</i> (2024)
6. What do you think are the opportunities and risks of making relationships too "virtual"? do you believe that tradition and innovation should coexist or should one of the two components prevail over the other?	Paoloni <i>et al.</i> (2023)
7. What are the future expectations for the industry and the company? What are the upcoming company strategy and goals)	Zamboni <i>et al.</i> (2024)

**Source:** Authors' elaboration

Alberto Baesso is the heart of WayPoint, and his proactive leadership (C) is fundamental to the company's constant innovation and development. Under his management, WayPoint has promoted and continues to encourage transdisciplinarity, actively collaborating with universities to develop cutting-edge solutions. In this regard, the vision of "transdisciplinarity in lighting" leads the company to invest heavily in research and development, funding universities and doctoral scholarships, with plans to further strengthen the relationship between business and academia with a view to constant and fruitful interaction. WayPoint's mission, on the other hand, is to combine tradition and craftsmanship, integrated with sustainability, creating customized products for customers with full respect for "innovative craftsmanship." For this reason, the company has seen a generational transition that has ensured business continuity and the pursuit of long-term goals. Mr Baesso's charisma and experience, accompanied by a very farsighted vision, have been the drivers that have made relationships the milestones of the company. His aim, together with the aim of his son Philippe, is to use digitalization (i.e. AI, computer-mediated technology, digital tools and systems) to leverage branding, reputation, strategic alliances and relationships with other value chain members, enhancing VRC not only externally but internally within the company.

WayPoint is positioned in the Treviso province, near Montebelluna and Castelfranco Veneto, precisely at the core of the northeast socio-economic cultural context (A). This thriving entrepreneurial area with a high presence of industrial districts has increased continuous exchange and the creation of strong relationships with other realities of the territory. This "Made in Italy" authenticity is driven by the quality of the Italian craftsmanship, which combines experience, quality and uniqueness of the product offered. One of the company's objectives is to export Made in Italy products across Europe and worldwide. Another essential element is WayPoint's commitment to supporting areas in Italy with a slower development rate. Indeed, through the funding of scholarships, WayPoint concretizes its effort to provide opportunities in regions that would otherwise find it more challenging to secure new solutions to encourage investment in research and laboratory activity. Moreover, the company promotes R&D-driven innovation, collaborating and



financing university projects; one instance is the collaboration with the University of Palermo to develop an ESG (Environmental, Social, Governance) system for non-financial reporting within the WayPoint context. Moreover, Mr Baesso stressed the great company's interest in the opportunity offered by the new program financed by the National Recovery and Resilience Plan called iNEST- Interconnected Nord East Innovation Ecosystem (INEST, 2024). The iNEST program stands as a concrete example of an innovation ecosystem mainly oriented towards industrial research to extend the benefits of the new technologies to the "key specialization areas" of the North-Eastern Italian territory with collaboration among nine universities, three research institutes and several other external actors (Chin *et al.*, 2023; Marchigiani and Garofolo, 2023). From an open innovation perspective, the company is interested in new technologies, patents and other intellectual property rights that may originate from the innovative start-ups involved.

The organization and management of the company (O) have seen the progressive development of strategies and tools that have significantly improved production processes and, as a side-effect, relationships. The company has successfully implemented strategies such as the "just-in-time" approach (i.e. "make-to-order" production) to improve production process efficiency and strengthen customer relationships. This approach reduces waste, optimizes costs and offers customized semi-finished products, enhancing the "Made in Italy" philosophy. In addition, the company promotes trust and awareness of its products by providing valuable know-how. In addition, WayPoint uses e-commerce as the main channel for selling its products. This system is integrated with analytics tools, allowing the company to tailor its product offering based on customer interactions on the platform. This approach fosters customer loyalty to the brand and helps expand the sales network and virtual connection, both nationally and internationally. In the future, WayPoint's goal is to become a benchmark in the lighting industry by being aligned with the principle of "mass customization," which combines the company's craftsmanship with the customer's active participation in the product design and customization process. This innovative approach allows the production of differentiated and unique end products, guaranteeing a competitive advantage and long-term durability.

Another fundamental pillar of the company is sustainability (S), embodied by the "Light for future" concept. As mentioned in the literature, sustainability is not only a trend but also a fundamental development line needed to obtain a durable competitive advantage (Biloslavo *et al.*, 2018). WayPoint promotes innovation as a means to achieve greater sustainability and the implementation of revolutionary solutions in this area, creating a unique competitive advantage with respect to competitors. The company has demonstrated a strong sensitivity towards the environment and the circular economy, both in its past and future goals. Over the years, it has revised its business model to promote clear, objective and transparent sustainability reporting, even in light of the United Nations SDG's launch. In collaboration with various local universities, WayPoint has adopted innovative solutions, including the ESG MES, the NFC tag and the Eten Things Cloud CO2/COV:

- ESG MES is based on an execution system applied to machinery to assess production efficiency. The company has integrated this technology with algorithms to obtain sustainability-related key performance indicators (KPIs), improving transparency and objectivity in sharing information with customers.
- The NFC tag is a recently developed solution in which a digital tag is attached to products. Customers can scan this tag via an app to view the components on the device and, if necessary, place an order for the replacement of defective components. This further simplifies the ordering and delivery process, increasing the lifespan of the products.



- The Eten Things Cloud CO2/COV is a reporting system that collects real-time data on atmospheric emissions from control units installed at various emission points. This data is read out on a platform developed by WayPoint, where pre-alarm and alarm thresholds can be set to monitor emissions.

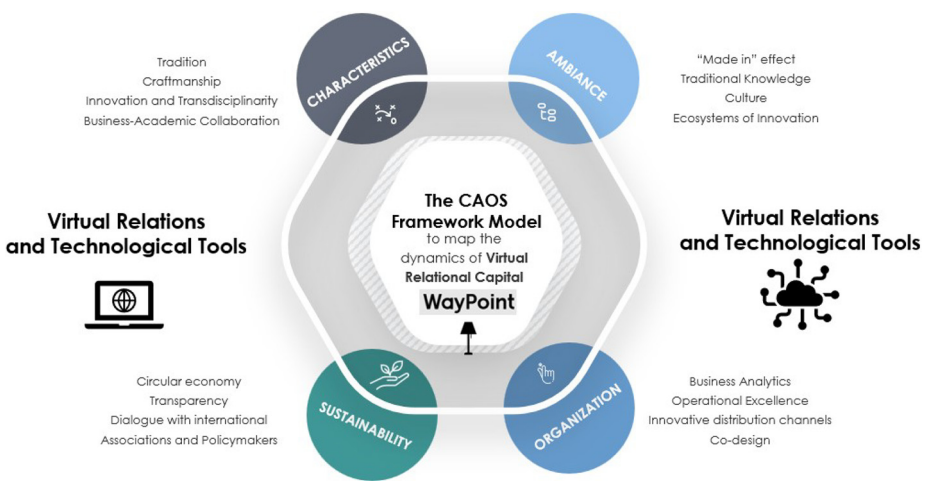
The company is concretely committed to promoting sustainable solutions to limit the phenomena of greenwashing and covering wrongdoing, which are widespread practices among organizations seeking to exploit sustainability to enhance their reputation and credibility. By collaborating with institutions such as LightingEurope, the company aims to spread the importance of a shared commitment to the green economy and transparency in sustainable reporting. LightingEurope is dedicated to promoting efficient lighting to improve human comfort, safety and well-being and creating a favorable regulatory environment for the lighting industry in Europe.

All in all, findings show WayPoint as a modern company, small in size but still very connected to the world with a significant focus on research, innovation and sustainability. The idea of bringing Made in Italy craftsmanship with high added value worldwide uses VR as a levers to internationalize the market, using sustainability and quality as distinctive factors. The great interest in academic collaborations, open innovation practices and new ecosystems of innovation bring the company the opportunity to be a first mover in its sector, able to anticipate and respond quickly and efficiently to market demands.

Figure 1 represents the main findings following the CAOS framework model (Paoloni, 2021), proposing a clear and direct understanding of the data obtained during the entire investigation.

**Discussion**

The potential role of RC and, more importantly, VRC in disrupting and supporting business development has been analyzed using the WayPoint case study, as a sound example to understand some of its in-depth dynamics. Even if single cases can hardly be generalized,



Source: Authors' elaboration

**Figure 1.** The CAOS model applied to the WayPoint case study

some of the concepts identified in such a company could be valuable when applied to a broader audience of small and medium-sized firms, especially in “made-in” scenarios like the one in Italy. For this specific kind of organization, VRC can play a fundamental role, allowing it to innovate and remain globally competitive in highly complex markets. This is particularly true for crafting companies like WayPoint, which often urgently need to improve commercial and sales performance, taking into account the balance between tradition and innovation to achieve and maintain a sustainable competitive advantage. Virtual tools permit to accelerate and facilitate business development through the use of modern technologies, extending the range of action and allowing a continuous relationship with company stakeholders, who are often geographically far (Secundo *et al.*, 2019).

The lighting sector, analyzed in the specific case of WayPoint, is an ideal model to see the application of innovative solutions that can enhance network effect, made possible through VR integrated with modern technological tools and sustainability (Centobelli *et al.*, 2020). In this regard, “Light for future” is the guiding brand and concept of WayPoint and consists of a system of electronic traceability and control of product functionality, which allows multiple customers to be in constant dialogue with the company (Paoloni *et al.*, 2023). This forward-looking solution embodies the VRC concept and drives the firm’s organizational and managerial side, recalling the “O” of the CAOS model as well (Yasir *et al.*, 2014). The basic assumption, in fact, is to associate technology with products to make them more durable and innovative, combining goods with extra services to improve their quality and performance (Rammer, 2023). The immediate consequence is improving overall well-being, overcoming geographical barriers, thus giving rise to new trends and favoring digital transformation (Yetis Larsson *et al.*, 2019). At the same time, this peculiarity allows, in light of the needs related to the circular economy (Centobelli *et al.*, 2020), to promote eco-sustainable solutions and environmental protection, as highlighted by the “S” of the CAOS model mentioned above.

In the WayPoint case study, the company uses an effective and certified method that can be valuable for the European community on green economy issues to promote transparency, objectivity and truthfulness. Upstream is the realization that, by limiting waste and favoring durability and reuse, it is possible to make oneself eco-friendly and more efficient, benefiting in cost reduction and communication with stakeholders. This element fosters brand awareness, creating trust and customer loyalty (Paoloni and Modaffari, 2022). This competitive advantage, driven by the research of a sustainable business model, is amplified by digitalization and new VR models. In addition to this, due to the lack of uniform quantitative feedback on sustainability, WayPoint also aims to align sustainable reporting with the ONU’s SDGs. Findings underline how the company strives to combat uncertainty and subjectivity in reporting results in this area as a way to near external stakeholders, making them feel part of a community in which they can recognize themselves (Fait *et al.*, 2020). The real shortcoming is the lack of homogenous quantitative feedback on sustainability. This creates extreme uncertainty and subjectivity in sharing results on these aspects, making it much more difficult to ascertain when one is telling the truth or not. This statement by Giuseppe Crapa, a member of sustainability’s working group and WayPoint’s representative in LightingEurope, highlights the need to adapt to widely recognized standards to improve brand reputation and loyalty, at the basis of VRC. That is why WayPoint is working hard to offer a valid solution that can objectivize sustainability disclosure, to be a landmark for its community and the sector overall, finding new ways to communicate results by using virtual tools (e.g. website, social networks, newsletters, etc.) to support this increasingly widespread sensitivity (Massaro *et al.*, 2018; Suti and Sari, 2023). In this regard, the association of Lighting Europe is making a considerable effort to create a

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context in which companies inspire each other to level up their businesses (Chin *et al.*, 2023), upscaling their potential and opportunities to grow, combining at the same time efficiency and sustainability. The association's goals would not be possible without a constant connection with the partners, dealt with using VR and digital technologies. The WayPoint's case underlines how SMEs' managers should strongly believe in a continuous and fruitful dialogue with institutions, aimed at fostering relations with internal and external stakeholders (Chang *et al.*, 2018). Such a dialogue inspires changes in the industry, also embracing megatrends like sustainability and enhancing the customer shopping experience to collect, as a consequence, feedback that is essential for the circulation of information and data to lay the foundation for the implementation of a disruptive business model that can leverage the potential of VRC.

Transdisciplinarity stands as one more value that can be derived from the case study, and which represents a key asset nurtured by VRC to maintain a strong market position in the highly competitive market with the idea of collective intelligence, a concept explained by the fact that multiple independent actors who work together may perform better than any individual actor working alone (Marinelli *et al.*, 2023). As suggested by the in-depth analysis of WayPoint, SMEs can complement tradition and innovation, promoting an approach of constant collaboration with universities to implement new innovative solutions funding research aimed at industrial application (Chin *et al.*, 2023) and the socio-economic cultural contexts's development (as deepened in the "A" of CAOS). At the same time, active participation in international associations (like LightingEurope in the case of WayPoint) aims to contribute to institutional regulation in the context of a green economy, allowing SMEs to be present in the current debate and raise their voices.

The relevance of these interactions fits perfectly with the ecosystems of innovation perspective (Biancuzzi *et al.*, 2024; Chin *et al.*, 2023; Lanzalonga *et al.*, 2023; Secundo *et al.*, 2018). An innovation ecosystem is defined as "the evolving set of actors, activities, and artifacts, and the institutions and relations, including complementary and substitute relations, that are important for the innovative performance of an actor or a population of actors" (Granstrand and Holgersson, 2020). It is imperative in the actual Industry 4.0 context that technology development depends on how industry, universities, and institutions synergistically interact to foster innovation for sustainable growth, as explained in the Triple Helix Model (Dell'Anno and del Giudice, 2015). VRC plays a fundamental role because it allows keeping in touch with all the various players in the ecosystem, even if they are hundreds or thousands of miles away. Moreover, the audience of stakeholders is extremely expanded as never before, thanks to the advent of these technologies (Caputa *et al.*, 2021; Dal Mas *et al.*, 2020; Lanzalonga *et al.*, 2023). In the iNEST project (INEST, 2024), for example, VR are maintained through periodic upgrade calls and a shared drive on which to share the work done, the objectives achieved and the planned deliverables. All actors are an integral and active part of the ecosystem, even if they are located in different regions (Bellis *et al.*, 2022; Paoloni *et al.*, 2023). The case study underlines the utmost importance of leveraging on an open innovation perspective through a new kind of entrepreneurship closely linked with the local innovation systems, learning units and the context in which decisions are taken. Only with a strong VRC can companies have the opportunity to collaborate on an ongoing basis with universities and research institutions. In the specific case study, WayPoint has a long-lasting collaboration with the University of Palermo, featuring several industry-university projects in the last few years (Dell'Anno and del Giudice, 2015; Massaro *et al.*, 2022; Secundo *et al.*, 2018).

In light of this complementarity between tradition and innovation, with the idea that only by deliberately pursuing what is pure and ordinary it is possible to achieve what is

extraordinary, several SMEs like WayPoint believe in the principle of the “*festina lente*”, or a way of innovating that is in line with the historical context and the technological development in progress (Biloslavo *et al.*, 2018). The “Made in” heritage, like in the context of Italy, may represent a strategic value for SMEs, which have the opportunity to export their products all over the world through the use of digital technologies (Festa *et al.*, 2020). The e-commerce possibility is a clear example of how VRC is a fundamental tool for developing Italian SMEs in the international market (Paoloni *et al.*, 2022). In the case of WayPoint, e-commerce overcomes the geographical barriers and permits learning day by day from the data collected and analyzed by the data analytics tool, which can track and map customer behavior on e-commerce to target users by defining an *ad hoc* offer that meets their needs. This is a clear example of how VCR may support business development by creating opportunities and efficiently communicating with the company through the use of modern technologies. The importance of investment in innovations of this kind lies in gathering the necessary data based on which a timely strategy that is aligned with changing market trends can be defined but always starts with customer needs and requirements.

The WayPoint’ case study should represent a sound example of how to exploit new and existing technologies such as e-commerce, telecommunications channels and other virtual facilitators to maintain strong relationships anywhere in the world with suppliers, partners, universities and trade associations, with the aim to create a local company opens to global opportunities, increasing, at the same time, its sensitivity through sustainability.

### **Conclusion**

The in-depth analysis of WayPoint supports the explanation of the significant impact of VRC on the entire socio-economic context, with specific regard to several aspects summarized in the CAOS framework model.

Trying to address our RQ, namely, the potential role of VRC in disrupting and supporting business development, considering both technologies and sustainability issues, we can highlight how, first of all, VRC empowers the innovation ecosystem, allowing the integration of complementary skills and disciplines aimed at the synergic development of all the actors and realities that interact with each other, intending to bring economic and social improvement (Bellis *et al.*, 2022; Biancuzzi *et al.*, 2024; Chin *et al.*, 2023; Massaro *et al.*, 2022). Entrepreneurs’ charisma and vision (C) allow SMEs to continuously innovate, promote business-academic collaborations and exploit VR opportunities internally and externally.

VRC impacts the commercial apparatus linked to the industrial sector, empowering a constant dialogue with institutions, promoting its development through *ad hoc* measures (Festa *et al.*, 2020). In general terms, VRC fosters the ability to nurture the relationship with stakeholders, enhanced by the use of virtual solutions at the service of mutual improvement in the design and use of the products and services offered (Biloslavo *et al.*, 2018, 2020; Chin *et al.*, 2023; Dell’Anno and del Giudice, 2015; Secundo *et al.*, 2018). Essentially, VR permit to develop and maintain strong relationships with the entire territorially defined area (A), nourishing the opportunity to globally export and communicate values like, in the specific case of Way Point, the quality of Made in Italy craftsmanship.

From an organizational point of view (O), business process redesign and the use of e-commerce represent a fundamental worldwide sales channel to engage customers. This is a perfect example of how VRC works as a strategic lever for business development (Zamboni *et al.*, 2024). The mass customization concept, which will be pursued by the company in the next years, it will be made more efficient by digitalization and VR, giving the customers the possibility to co-draw their own product (Turner *et al.*, 2020).

Last but not least, VRC can promote sustainability (S), which is reconciled with the streamlining of the entire corporate structure made possible through alignment with the principles of circular economy and waste limitation (Biloslavo *et al.*, 2018; Centobelli *et al.*, 2020; Massaro *et al.*, 2018). Transdisciplinarity represents a main driver leading this change to foster a transition that promotes transparency, ethics and innovation, making the VRC the basis for the development of new cutting-edge and sustainable solutions that inspire an improvement in the industry and the entire entrepreneurial world.

#### *Practical implications*

The implications that emerged from this research reveal promising prospects for companies wishing to exploit the potential of VRC. The identification of new challenges from virtual interactions offers tangible opportunities for business growth by facilitating the building of meaningful relationships with stakeholders. From more straightforward and widely recognized tools like e-commerce and marketplaces to more refined big data analytics and connection with international associations, various opportunities may arise according to the company's aims and needs. However, it is crucial to emphasize that the effective management of such relationships requires a deep understanding of virtual dynamics and their related challenges.

#### *Policy implications*

For policymakers, a vital responsibility emerges in fostering the adoption of technological tools and the intensification of virtual interactions in business practices. The creation of appropriate incentives and regulations can play a key role in promoting the ethical and sustainable use of digital technologies while fostering the building of RC in the virtual age.

#### *Limitations of the study and further research opportunities*

The contribution of this research to intellectual and RC theory is manifested in its ability to expand the understanding of how virtual interactions can influence the creation and management of business relationships. Moreover, our study contributes to the use of the CAOS framework by focusing on the VR fostered by the use of new technologies, leading to a new perspective toward a "Virtual CAOS" model.

It is essential to recognize the limitations of this research. The focus on specific industries, and, more importantly, the use of single cases limits the generalization of the results, necessitating more in-depth analysis in different industry contexts. The new perspectives introduced should stimulate further research and insights in the field, contributing to a more complete understanding of the crucial role of VRC in contemporary business dynamics. A more general investigation, endorsed by industrial associations, could offer a broader picture of the phenomenon and raise some relevant open issues concerning e.g. ethics, technology acceptance dynamics, availability of tools and knowledge on their use, [...] Focusing on single or multiple business cases, maybe deriving from various sectors e.g. food, tourism, fashion, healthcare may allow for a deeper understanding of the dynamics and specific challenges companies may face in managing and nourishing their VRC.

#### **Note**

1. See the corporate website: [www.waypoint-light.com/en/](http://www.waypoint-light.com/en/)

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