

Dario Bertocchi / Nicola Camatti / Jan Van der Borg

# Tourism Observatories for monitoring MED destinations performance. The case of ShapeTourism project

## Abstract

Following the precedent set by the Tourism Observatory (TO) run by the European Commission-DG GROW a few years ago, several initiatives have taken place to design and manage tourism observatories at both the transnational and local level. However, these initiatives do not yet seem able to provide adequate operational responses to the challenges that the Commission launched with the original TO. While the opportunities offered by the Web 2.0 still do not seem to have been sufficiently taken advantage of, such initiatives also have not yet developed suitable methodologies to operationally include the tourism industry in the studies and monitoring performed by the TOs. This work presents the lesson learnt from the ShapeTourism prototype including two different tools: an observatory with official and unofficial indicators, and a simulation tool to predict different scenarios and different sustainability levels, designed specifically to overcome the aforementioned limits. The prototype was tested in 2017 on the entire eligible area of the 2014-2020 MED Programme covering 52 regions. The potentialities of this tool are shown through the creation of indicators, benchmarking and applications.

**Key words:** Tourism Observatory; destination management; decision support system; participatory processes; coastal and maritime destinations

## 1. Introduction

As underlined by a recent United Nations World Tourism Organization (UNWTO) report for the European Commission, Directorate-General for Enterprise and Industry, international tourism has shown exceptional development from World War II onwards. International tourist arrivals worldwide have increased from just 25 million in 1950 to 1.5 billion in 2019, while international tourism revenues have increased to US \$1.7 trillion (UNWTO, 2020). In European Union member countries, international tourist arrivals have increased from 153 million in 1980 to 710 million in 2018 (UNWTO, 2019). However, according to UNWTO estimates, international tourist arrivals to destinations in the EU-28 are expected to grow by 2.1% per year up until 2025, while the 1995-2010 period before Covid averaged 2.4%. The Covid-19 worldwide pandemic has stopped international tourism flows and significantly limited domestic flows. At this particular moment (October 2020) the European Union suffers from the highest rate of infection, and several countries have decided to re-introduce total lockdown or restrictions on the mobility of people. Despite the tragic global situation, emerging and developing countries will continue attracting increasing numbers of tourists, meaning European tourist destinations will have to face both growing competition and further structural changes relating, for example, to demographic trends, climate change, and the impact of new technologies. People over the age of 65 are anticipated to account for 20% of the population in 2020. The tourism industry will soon have to adapt its tourism offer to this new target market consisting of individuals with purchasing

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**Dario Bertocchi**, Ca' Foscari University of Venice, Italy; e-mail: [dario.bertocchi@unive.it](mailto:dario.bertocchi@unive.it)

**Nicola Camatti**, Ca' Foscari University of Venice, Italy; e-mail: [nicola.camatti@unive.it](mailto:nicola.camatti@unive.it)

**Jan Van der Borg**, Ca' Foscari University of Venice, Italy; Katholieke Universiteit Leuven, Belgium; e-mail: [vdborg@unive.it](mailto:vdborg@unive.it)

power and leisure time but also special needs. Climate change may lead to water scarcity, a decline in snow cover in mountain regions, coastal corrosion, pressure on biodiversity, and risks to cultural heritage, particularly in destinations affected by over-tourism. Tourism policies will have to intervene with an appropriate mitigation investment strategy. Although the ICT's development has strengthened destinations' competitiveness, small tourism businesses have yet to fully exploit this situation by investing in professional skills and infrastructures.

To address these challenges, the EU proposes a series of initiatives aimed at: (1) Stimulating competitiveness in the European tourism sector; (2) Promoting the development of sustainable, responsible, and high-quality tourism; (3) Consolidating Europe's image as a collection of sustainable and high-quality destinations; (4) Maximizing the potential of EU financial policies and instruments to develop tourism. All four of these priorities must be implemented to "provide the skeleton for a new action framework for tourism". Specifically, in order to fulfil the second priority, the Commission focuses on consolidating the tourism sector's socioeconomic knowledge base to boost competitiveness, underscoring the importance of Directive 95/57/EC on the collection of statistical information in the tourism sector in order to create the preconditions for sharing information and analysis useful for understanding both critical issues and new opportunities that tourism can offer for the socioeconomic development of member countries. The directive considers both European tourism trends and user needs, with the hope that tourist destinations will soon be able to regularly predict these new trends, examine their origins and develop response strategies. The hope is therefore to stimulate a renewal of destination management models using operational tools appropriately employed by the widest pool of stakeholders. These models should then be capable of supporting the creation of a real system for the production and sharing of knowledge within the tourism industry.

As a result, the need to provide the various Member States with new and innovative tools for the analysis and interpretation of tourism phenomena will become increasingly pressing. Particular attention must therefore be paid to tools such as Tourist Observatories, strategic units capable of facilitating the creation, management and transfer of knowledge that supports the decision-making process of tourism industry stakeholders (Varra, Buzzigoli, & Loro, 2012).

The good practice of the European Virtual Tourism Observatory promoted by the EU is undoubtedly a positive first step towards the creation of observatories capable of addressing these challenges, but further improvements and developments are still desirable.

On this note, there have been a number of European practices that been consolidated in recent years. The one that stands out in particular is the development of strategic indicators and the enhancement of user-generated content obtainable from the major WEB 2.0 tourism platforms. Yet, greater consideration is desired for certain other models of Tourism Observatories which are demonstrating encouraging potential to overcome the limitations of official statistics on which the VTO is still based, as well as the creation of the desired knowledge systems specifically designed around the needs of the stakeholders in the tourism industry.

Starting with the implementation of the European Virtual Tourist Observatory project, the primary objective of this work is to draw attention to the potential of the most recent developments in the field of Tourist Observatories, highlighting their usefulness as tools to support a more competitive and sustainable development model for tourist destinations. The paper will also highlight how these tools can represent a stimulus for the renewed governance of tourist destinations capable of facilitating the creation of transnational networks of knowledge managed through the active and direct involvement of stakeholders within the tourism industry.

## 2. Consolidating the socioeconomic knowledge base for tourism. The case of the VTO

In order to effectively make the tourism industry more competitive, the Commission acknowledges the importance of creating a better socio-economic knowledge-base at European level that is centered on tourism's relationship with the environment (European Commission, 2010). To this end the European Commission made operational proposals highlighting the necessity of encouraging cooperation between Member States, destinations, industry representatives, and public and private operators, in order to strengthen data related to tourism. The EU's intentions obviously go beyond the mere collection of data or the updating of the most widespread tourism statistics and aim, if anything, to develop more complex knowledge networks between research institutes, universities and public and private monitoring units, in close cooperation with regional and national authorities, national tourism offices, statistical institutes and other operators (European Commission, 2010).

In fact, while the commission's role coordinating statistical activity at the European level has devolved to Eurostat, the Commission still considers itself responsible for supporting the development of knowledge networks between research institutions, universities, and public and private monitoring units. These networks should be based on an integrated and synergistic approach in collaboration with other European and international organizations, such as the Organization for Economic Co-operation and Development (OECD) and the UNWTO.

The purpose of the EU's role in strengthening tourism data and information must therefore be understood as focused on creating a transnational system capable of supporting the choices of the European tourism industry, as well as facilitating the exchange of information and knowledge necessary to face the great challenges that tourism will be called to cope with in the coming decades. But looking at the practice to date, among the proposals put forward, what stands out is the European Virtual Tourism Observatory which was set up by the Commission to coordinate socio-economic research on European tourism, conducted by various national research institutes, and intended to be an important first step towards achieving the transnational knowledge base necessary to support the tourism industry.

In fact, as explained on its official website, the purpose of the VTO is to facilitate access to statistics and other information, improve socio-economic knowledge of the sector and support the development of policies based on concrete data. A careful analysis of the structure of this tool may highlight the state of the operational development of these purposes.

### 2.1. VTO main features and functions

The Virtual Tourism Observatory is an online portal that provides access to a comprehensive range of information on the tourism sector, its environmental impact, and the origin and profile of tourists. The portal consists of five sections which include:

**Country profiles:** the country profiles offer a snapshot of key tourism indicators for the European Union and each of its member countries. A user-friendly interface allows the user to personalise the analysis, benchmark two or more countries, and download economic indicators and tourism data;

**Statistics illustrated:** is a visualisation tool that displays monthly and annual data on tourist flows, accommodation capacity, occupancy, expenditure, and other aspects of EU residents' trips. The tool lets the user visualise data such as maps, tables, or graphs. The dynamic dashboards help users to comparatively analyse and evaluate tourism trends. This tool has been developed by the Directorate-General (DG) for Internal Market, Industry, Entrepreneurship, and SMEs, as well as Eurostat;

**Eurobarometer survey:** the European Union is a major source of tourists for destinations, as many Europeans travel in the EU and worldwide. Flash Eurobarometer surveys reveal preferences and attitudes of Europeans towards tourism. The Eurobarometer surveys offer a portrait of the current situation and the outlook for the upcoming year;

**Studies and reports:** the Observatory is also a repository for reports, studies, and papers relevant to tourism policy-makers and businesses. A user-friendly tool allows users to search the extensive library by country, theme, or year of publication. This section offers access to all relevant publications of DG Internal Markets, Industry, Entrepreneurship, and SMEs, and the Commission, as well as to a wide range of works published by other institutions, international organisations, member states, and academia;

**More data sources:** a useful collection of links to national and international organisations and observatories providing facts and figures on the tourism sector in Europe and worldwide.

In general, therefore, the VTO is presented as a user-friendly interface that can be easily downloaded and offers a selection of analysis tools. It is based on a robust data and metadata structure that can be conveniently visualized. The vision that emerges is in line with the premise that an observatory must have a strong focus on data and research presentation, without necessarily providing the interpretation of this information, and therefore avoiding driving a particular political agenda or being a network of knowledge (Office for National Statistics, 2013).

## 2.2. Limits to the VTO implementation state

One of the advantages of the VTO is that it creates a single platform for the collection and display of data'. Taking into account the impact that tourism can have at a local and regional level (UNWTO, 2016b) it has been widely recognized that destinations should be pushed to adopt more appropriate solutions through which to analyze and organize the tourism industry (Duffield, 1982; Mancini, Leyshon, Manson, Coghill, & Lusseau, 2020; Mowforth & Munt, 2015; Roberts & Tribe, 2008; Thomason, Crompton, & Kamp, 1978; Watson & Kopachevsky, 1996).

The EU's interventions aimed at strengthening data collection should therefore, in the first place, give rise to monitoring systems of the global tourism industry that are capable of providing useful information to help identify the strategic directions that the sector should move in. In such a context, the use of key indicators is essential not only in providing early warnings about current trends, but also by establishing close relationships between research centers, observatories and working groups to ensure a smooth transfer of knowledge, while providing the tourism organizations with the intelligence and strategic tools necessary to define their development plans (Buhalis & Costa, 2006). The approach that should be aimed for is cognitive-systemic and should act as a fundamental tool for the management of resources and the various needs of the territory, the coordination of development policies, as well as to facilitate the processes of knowledge management and new cultural trends that satisfy all stakeholders (Varra et al., 2012).

In spite of this, the main features of the current VTO do not actually seem, apart from the insertion of sections pertaining to Eurobarometer Survey and Studies and Reports, to go beyond the mere reorganization of official statistics, albeit in a single portal, that each member state is already required to provide in accordance with their own national statistical institutes.

More specifically, lacunae still remain with regards to the data collection process, the active involvement of public and private tourism organizations, and the exploitation of other data sources besides the traditional ones already widely used at different levels of government.

Indeed, several Observatories such as the European VTO and others born out of this initiative's momentum (for example, the Observatories advancing tourism impact monitoring at destination level [INSTO] network promoted by the UNWTO) accept the challenge of merging their information into a single shared virtual location that contains an in-depth analysis based on official statistics. However, each institution's data has still only been collected at the national level. This represents an important limit to the development of destination management tools, which instead require, at the very least, regional-level information focused on a destination's specific features in relation to their positioning on the life cycle. In addition to this, as highlighted by the European Commission, knowledge networks must also include the tourism industry in analysis and monitoring. This inclusion leads to a twofold advantage. Firstly, the tourism industry possesses data only partially recognized by official tourism statistics (e.g. spending, travel motivations, special visitor needs) that could help to improve analyses' quality and usefulness. Secondly, if included through suitable surveys, the tourism industry can make its sensitivity and knowledge of a certain territory available, thereby improving and consolidating studies of future tourism trends. But to date the VTO has not yet activated channels and activities for involving stakeholders. Finally, as regards the use of alternative data sources, greater consideration should be given to the role of ICT which, as already mentioned, may add value within the tourism sector. The sharing economy (i.e. Airbnb) is regulated within virtual and online networks such as Web 2.0, social networks such as Instagram, and reviews portals such as TripAdvisor, represents an invaluable source of information that, if properly used, can help tourist stakeholders define their policies and strategies. A tourist observatory cannot ignore the presence, analysis and exploitation of these sources for informative purposes.

### 3. The need of a tourism observatory model

In the years, tourism observatory tools have been considered relevant and strategic to monitor tourism performance, growth, impacts, trends and the tourism appeal of territories and regions (Benito, Solana, & López, 2014; Haldrup & Larsen, 2009). Destination managers are considering adopting these tools, not only to collect and store an entire dataset pertaining to a single destination in one digital location, but also to have a place where data is translated into indicators and knowledge able to support decision makers in developing tourism strategies. Those tools are able to monitor tourism activity in their territories, either locally or nationally, and provide timely and reliable insights on a destination's evolution, trends, dynamics and market position (Milheiro, Dinis, & Correia, 2011).

Tourism observers can also focus on the supply side and the principles established by the World Tourism Organisation (WTO) and its tourism satellite account methodology, with the aim of understanding how much tourism contributes to the development of nations and regions. In addition, this can help uncover the interconnected economic relationships created by business networks and make tourism forecasts capable of monitoring and informing the number of visitors that destinations can attract, thus allowing an analysis of how tourists interact with the local economy and society in the destinations.

As argued by Varra et al. (2012) the Tourist Destination Observers are tools of innovation, they define new codified and shared processes for the development of a destination, and their design is based on the monitoring of phenomena linked to the competitiveness and sustainability of a destination and the active involvement of stakeholders. Observers can thus become an important tool providing support and leadership among all stakeholders, helping to cultivate a constructive and positive energy.

Thanks of the research of Brandão (2007), who compared different tourism observatories (in France, Italy and Portugal) it is possible to structure tourism observatories in different ways, yet always built with the following aims:

1. Anticipate the dynamics of the sector using different and up-to-date data sources.
2. Implement a global view of the sector from a multidimensional perspective able to define a larger strategy for the destination.
3. Provide, via reports and statistics, sufficient and quality information to serve as a basis for decision-making by different economic agents involved in the tourism sector, while at the same time allowing for an evaluation of the impact that public policies and initiatives of any other kind may have on the aforementioned industry.
4. To encourage debate between the different economic agents that make up the sector (administration, associations, employers, etc.) through regular meetings in which they will present and discuss the results obtained and the possible strategies to be developed.

### 3.1. Aims and targets

Different aims can be reached through the creation of a tourism observatory that, for example, may monitor tourist flows, address and develop marketing campaigns and advertising, benchmarking regarding the main competitors and support the integration and investments of SMEs in the tourism market. Additionally, in the the digital economy, the creation of a tourism observatory may support vertical cooperation between destinations and intermediaries, and promote the production of new tourism services (Morella, 2006). According to various authors (Buhalis, 2003; Costa, Rita, & Águas, 2001; Nacca, Di Maula, & Andreoli, 2010) the main targets of a tool as a tourism observatory can be summarized as:

- to solve the lack of statistical data, particularly on a regional/destination level;
- to improve the update and the sharing of different data sources;
- to fulfil the need for more data regarding the destination's competitiveness, trends and evolution of a tourism market;
- to deal with the difficulty of visualizing various pieces of data and indicators to better explain tourism sub-sector dynamics.

The Tourism Observatory is undoubtedly an institution and digital space that constantly generates scientific and statistical information on the development of tourist activity (Blasco Franch & Cuevas Contreras, 2013). The statistical information it provides helps to carry out an analysis and diagnosis that aids in public policy decision-making and private investment projects (Bartolomé, Lillo, & Sempere, 2009). Although the Observatory's ultimate tasks are to legitimise actions and strategies when there is a situation of uncertainty, it also focuses on observing and providing constant information, in order to achieve decision-making and the design of development strategies that are adapted to the needs and reality of each destination. This can be carried out, for example, through studies on seasonality (Cannas, 2012; Cuccia & Rizzo, 2011); occupation; expenditure (Sheldon, 1990; Bernini & Cracolici, 2015); studies on competitors' prices (Dwyer, Forsyth, & Rao, 2000; Mazanec, Wöber, & Zins, 2007); annual turnover and benchmarking. According to UNWTO recommendations for monitoring observatories of sustainable tourism, nine mandatory problem areas need to be assessed: tourism seasonality, employment, destination economic benefits, governance, local satisfaction, energy management, water management, waste management (for more details <http://insto.unwto.org/about/>).

### 3.2. Geographical levels and depth of information

At international and national level, tourism statistics are often restricted to a few indicators that draw attention to growth. Alternatively, they also can depict a decrease in overnight stays, accommodation

facilities, total expenditures, the number of travellers per year and the average time spent in a destination. This information can paint a restricted picture of tourism dynamics and trends, and what is desired is a means of understanding what these statistics reveal about the real wellbeing status of countries and territories. On the other hand, local statistics and micro data pertaining to tourism and destinations can more accurately represent the tourism patterns and more specific situation of a city, but are difficult to build, especially when it comes to data collection in order to create indicators and evidence.

### 3.3. Public and private partnership design

Tourism is a multidimensional issue that requires intersectoral visions not only in relation to travel, transportation and hospitality industries, but also regarding large scale aspects: from health to pollution, from security to regulation and management. The public sector is often a key stakeholder and driver in tourism innovation systems, contributing, amongst other things, to the development of strategic capacity, infrastructure, research-based knowledge, legal frameworks, and skill enhancement facilities (Hjalager, 2015). Tourism observatories are often desired and created by academic institutions such as universities and research groups, or by national or regional bodies that can easily link the expertise of statistical offices with the needs of tourism departments. The need of a co-designing process between private and public sectors is nowadays crucial to better address the scopes of observatories (Alves, 2013; Binkhorst & Den Dekker, 2009; Buonincontri & Micera, 2016; Voorberg, Bekkers, & Tummers 2015) and support the final targets of users that can take advantage of these tools by applying a data-driven approach during the activities of destination management/marketing, creation of tourism products and implementation of new services.

### 3.4. Systems of knowledge

The Observatory of Tourist Destinations should aim to deliver a system of knowledge that activates complete cycles of the creation, management and dissemination of knowledge. It should also take charge of the codification of knowledge available about the territory, both tacit and explicit, creating an added value through the integration, systematization and internalization of explicit knowledge.

Building on what has been described, this research aims to illustrate the prototyping and design of a tourism observatory based on single and composite indicators, which in turn is based on different levels of analysis, to better understand and monitor European regions and national tourism performances. According to McKelvey and Menczer (2013), authors agree that a proper tourism observatory should facilitate and support the use of mixed-method approaches, and users should benefit from interactive visualizations that allow them to identify key topics, destination insights and performance. Following the same methodology proposed by McKelvey and Menczer (2013) while designing the structure and the functionalities of a tourist observatory the following design goals have been applied: 1. Reliability of the data: collecting large scale datasets from official statistic institutes to ensure the stability of the information collected avoiding bias; 2. Reproducibility: developing the observatory with open-access data without using proprietary datasets; 3. Topic Filtering: by using European indicator standards developed by universal research institutions and indexes - such as the Travel and Tourism competitive index - that illustrate and clusterize tourism topics and themes; 4. Visualization (a key factor of the observatory): to help the user find out relevant information, improve legibility, as well as offering capabilities such as either an overview, filtering or zoom capabilities; 5. Open access, respected by an open web platform that allows users to visualize indicators and data, but also freely download them; 6. Legal compliance, respecting the privacy of sensitive or protected content by anonymizing information and losing the individual user level of detail.

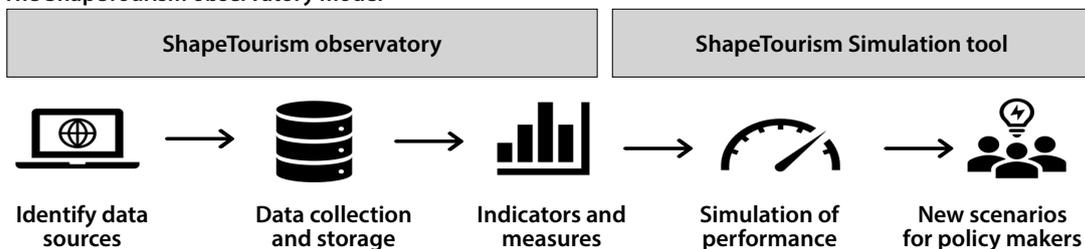
In this paper we introduce the first version of the ShapeTourism Observatory, an online tool that can be used to represent high volumes of highly disaggregated data related to the performance of tourism destinations and the behavior of tourists. The goal of this tool is to create a bridge between the world of data and the world of destination management, where statistical and non-statistical data are easily represented to tourism stakeholders and policy makers to help these actors apply a data-driven method for policy setting.

## 4. The ShapeTourism model

Based on the challenges launched by the European Commission, a consortium of five scientific groups proposed the idea of building a transnational tourism observatory within the framework of the 2014-2020 MED programme. This idea took form as the ShapeTourism project lead by Ca' Foscari University of Venice's Department of Economics. Through this project, the consortium developed a Smart Integrated Tourism Data System (SITDS) to monitor tourism development dynamics and assess the Mediterranean coastal regions' sustainability and tourism performance, as well as to support decision-making using scenario maps on tourism trends. This system, still open and available, takes the form of an online, interactive, and user-friendly observatory platform. The SITDS supports stakeholders who wish to improve their business or undertake management decisions in the Mediterranean regions, as quickly as possible, based on reliable data covering the 52 Mediterranean Regions.

The ShapeTourism model is based on two dimensions: one is the observatory, where indicators, measurement and asset levels are displayed in a dynamic map that facilitate the benchmarking between nations and regions as well as illustrating the key positive or negative aspects that determine the tourism performance; the second is the simulation tool, able to give meaning to some of the values revealed by the observatory and simulate a sustainable level of growth. Building on these two dimensions, the partnership went through different stages: identifying the available data source regarding socio-economic variables and concerning travel experience; data collection and storage; the analysis of the data with different statistical methods and the following creation of key indicators and sub-indicators. This then involved the measurement of these indicators and the simulation of performance levels and finally, the possibility of providing policy makers with new knowledge for sustainable development and management plans (Figure 1).

Figure 1  
The ShapeTourism observatory model



### 4.1. The ShapeTourism observatory

The steps that had to be taken to develop this tool were: identification of the variables to monitor tourism sustainability and performance, the selection of a dataset source, collecting and storing the data, analysis of the data and creation of indicators, the creation of the online tool and display of the information. In order to improve the knowledge framework about the tourism health of MED cultural destinations, four pillars have been taken to describe the economic, social and environmental issues of sustainability.

Those assets are:

1. **Attractiveness:** the concept of attractiveness refers to how a place is perceived and what types of assets it has to offer to different types of residents and visitors. Regions endowed with specific forms of territorial capital (or bundles of them) are attractive to specific audiences;
2. **Competitiveness:** the Travel and Tourism Competitiveness index (TTCI) of the World Economic Forum provides a means to measure a country's performance, and utilizes four sub-indices and their component parts to represent the overall quality, future potential and long-term sustainability of the tourism sector within each country assessed;
3. **Environmental and tourism sustainability:** where the UNWTO definition is taken into account to better define sustainable tourism as "tourism that takes full account of its future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities";
4. **Web reputation:** Online public opinions using various forms of social media are generating challenges for the tourism industry, destination managers and territories that have to rethink branding strategies including user-generated contents (UGC) representing one of the main sources of information for prospective travellers.

The observatory integrates traditional and statistical data with a broad mass of data, using new methods for collecting and processing UGC. It also generates new knowledge to overcome the limitations on information of conventional statistical analysis to represent tourism performance in the Med territories.

The primary data supporting this tool was collected from various official statistical sources (Eurostat, ESPON, and local national institutions). This data is useful to build the three main pillars of Shape Tourism Observatory, aggregating and developing official indicators. Different datasets for the 52 Mediterranean regions have been collected concerning regulatory level, business competitiveness, physical and mobility infrastructures, human, natural and cultural capital from the open-source website Eurostat.

Furthermore, unofficial data from the tourism web 2.0 platform TripAdvisor was collected and storage to design the web reputation pillars able to analyse the visitors and residents' perception. In this case a software built in R supported the collection procedures of the same regions able to map territories not only at nuts2 level as the dataset of Eurostat but also going down to the province and municipality level having latitude and longitude of every single place reviewed in TripAdvisor. Regarding TripAdvisor dataset all places belonging to attractions, restaurants, hotels and vacation rentals categories were collected.

In this research the authors avoided constructing a new system of indicators pertaining to tourism performance and sustainability, but instead focused on the contextualization of existing work that has been done on tourism indicators (Blancas, Lozano-Oyola, González, Guerrero, & Caballero, 2011; Butler, 1999; Castellani & Sala, 2010; Choi & Sirakaya, 2006; Gooroochurn & Sugiyarto, 2005; Lozano-Oyola, Blancas, González, & Caballero, 2012; Miller, 2001; Torres-Delgado & Saarinen, 2014) utilizing the frameworks developed by international organizations, such as the World Tourism Organization and World Economic Forum. Three main aspects were selected to compile the different sections of the Shape Tourism Observatory:

1. Adopt a coverage of tourism's main issues regarding the sustainable development in the tourism industry with the strategic composite indicators of attractiveness, competitiveness and sustainability;
2. Develop analysis based on a regional scale through a method of weighting and regionalization of macro and sub-indicators;
3. Ensure the measurability of the indicators over time, identifying datasets with historical series.

According to Mikulić, Kožić, and Krešić (2015), the weighting process of tourism indicators, especially within a regional scale, is an important issue in the measurement of tourism phenomena due to the necessity to compare performances of destinations, create rankings of analyzed regions and finally to support policymaking decisions. A data-centric approach was applied to regionalize the official indicators and sub-indicators (See Table 1 for the list), assigning regional variability to already existing national indicators using Eurostat and the European Observation Network for Territorial Development and Cohesion (ESPON) datasets at Nust2 level as regional proxies. In this way, according to the ultimate scope of indicator systems, the presented indicators could be visualized, disseminated and easily applied by stakeholders.

Following the same principles, the collected UGC contained a geographical aspect (e.g. name of the city, province, region and latitude and longitude) useful to weight the online reputation indicators with different spatial levels: municipal, provincial and regional. The web reputation macro-indicator is created to represent every single tourism dimension (accommodation, food, rentals and attractions) was built by calculating a weighted score using the rating score (in this case stars from 1 to 5) of the reviewed site (e.g. a museum, a restaurant, an hotel, an apartment) combined with the total number of reviews of a single point of interest (that is a proxy of its popularity). This was then used to create an aggregate index results of the administrative area of analysis on a single site. In addition to that, information about tourists (travelling solo, family, group, couple), type of tourism (leisure and business) and seasonality (Shannon index on the months of the years) are displayed.

Those different datasets have been analysed to create indicator and sub-indicators following the described principles (Table 1):

Table 1  
The ShapeTourism observatory structure

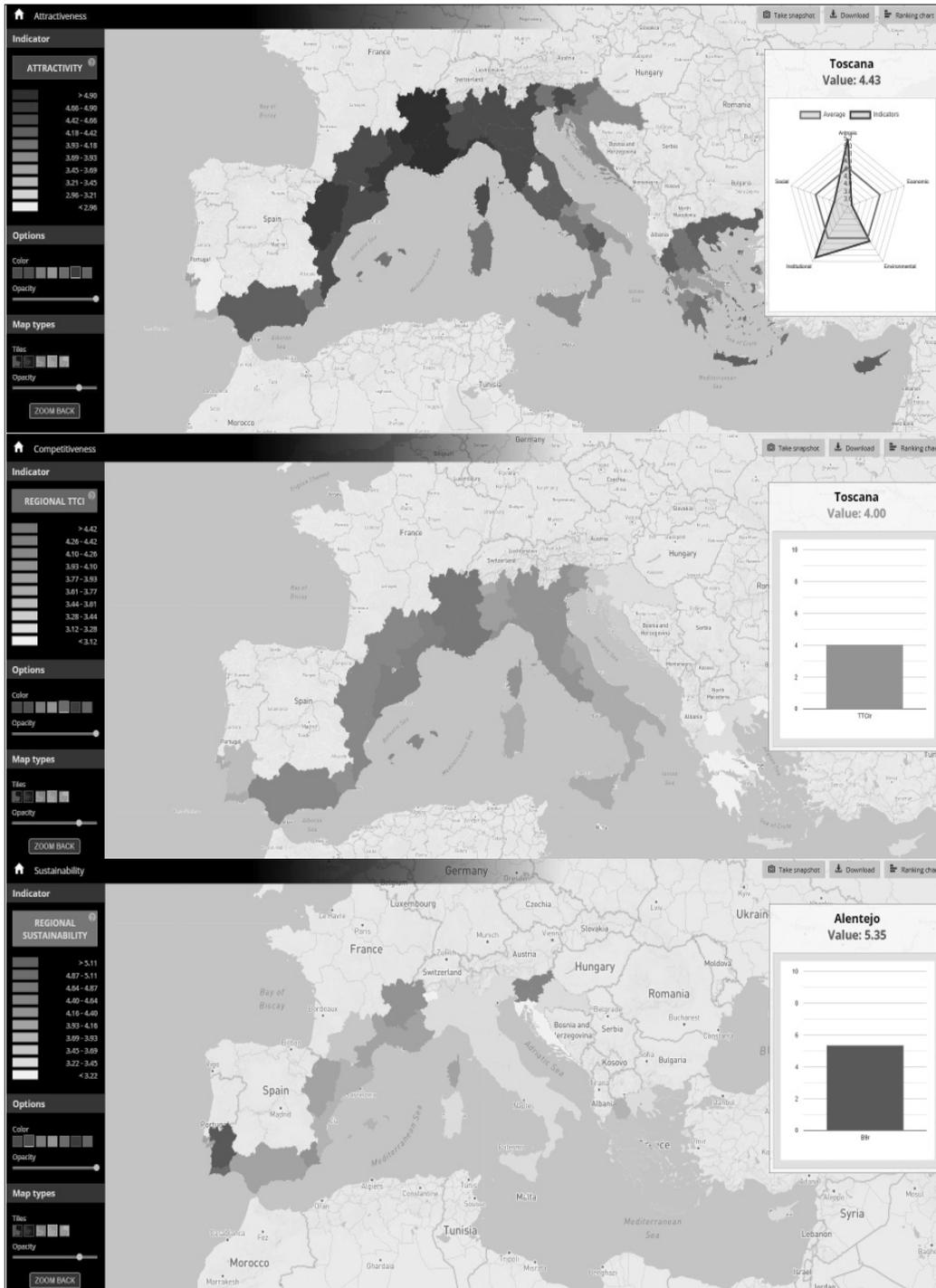
| Data source     | Main indicator  | Sub-indicators  | Geographical level                 |
|-----------------|-----------------|---|------------------------------------|
| Official data   | Attractiveness  | One macro-indicator of regional attractiveness and 5 sub-indicators of forms of capital namely: anthropic, economic, environmental, social and institutional capital.   | National and Nuts 2                |
|                 | Competitiveness | One macro-indicator of regional competitiveness and 15 sub-indicators describing dimensions that include: air travel, train and road infrastructure, prices, natural and cultural resources, ICT readiness, wellbeing and health, tourism and travel human resources and facilities.                                | National and Nuts 2                |
|                 | Sustainability  | One macro-indicator of regional sustainability and 14 sub-indicators describing the following dimensions: environmental regulation, patents in green technologies, waste management rate, sustainability in terms of tourism flows and pressure, air, water and heating pollution, coastal and forest preservation. | National and Nuts 2                |
| Unofficial data | Web reputation  | 4 dimensions (accommodation sectors, food and beverage sector, cultural and natural attractions and vacation rentals)   | Regional, provincial and municipal |

**Attractiveness:** Based on the Interreg Med ATTREG project (Attractiveness of European Regions and Cities for Residents and Visitors), the attractiveness indicator is subdivided into macro components (or sub-indices) capturing different aspects of "territorial capital" (environmental, economic, human, socio-cultural, and institutional capital).

**Competitiveness:** The point of reference used as an indicator is the World Economic Forum's Travel & Tourism Competitiveness Index (TTCI), which is calculated at the national level. The TTCI calculation methodology's main work concerns the indicator's regionalization which in turn is based on the main variables considered and the building weights that reflect the position of a given region with respect to the average of each variable.

**Sustainability:** According to the World Economic Forum sustainability index, this indicator considers factors such as diversification of local and regional economies, pressure on tourism resources, regulatory frameworks, social impact, and pollution (Figure 2).

Figure 2  
Attractivity, competitiveness and sustainability indexes of the ShapeTourism observatory



Source: <http://www.shapetourism.eu/main-output/shapetourism-observatory/>

**Web reputation:** This indicator considers feedbacks from residents and tourists posted on TripAdvisor regarding attractions, restaurants, and the hospitality sector within a single municipality/city. Crucial information such as popularity (number of reviews), quality (score rate), seasonality (period of the year), type of users (single traveller, couple or family) and type of trip (leisure or business) have been collected for every single place reviewed.

## 4.2. The ShapeTourism simulating tool

These indicators already overcome some of the limitations of other European observatories by providing regional, in addition to national, information able to surpass the benchmarking between nations in support of a deeper comparison of tourism territories and tourism areas (e.g. seaside destinations, mountain districts, etc.). A further tool (complementary to SITDS) has been developed by the ShapeTourism project in response to the need for the tourism industry's active involvement in analysis and monitoring activities. The scope of this dimension is to capitalise on the indicators, sub-indicators and all the data collected for the creation of the observatory and develop growth or degrowth scenarios able to better illustrate sustainable situations on unsustainable risks. This simulating tool consists of a supplementary online tool that aims to interpret future scenarios of the Mediterranean regions in relation to established indicators:

### 1. Physical indicators such as:

- Tourism guests density - as the ratio of the total number of arrivals at tourist accommodation establishments (number of guests), per year, relative to the total area (km<sup>2</sup>) of the region.
- Tourism density regarding nights spent - as the ratio of the total number of nights spent at tourist accommodation establishments, per year, relative to the total area (km<sup>2</sup>) of the region.
- Accommodation density concerning number of bed places – as the ratio of the total number of bed places relative to the total area (km<sup>2</sup>) of the region.

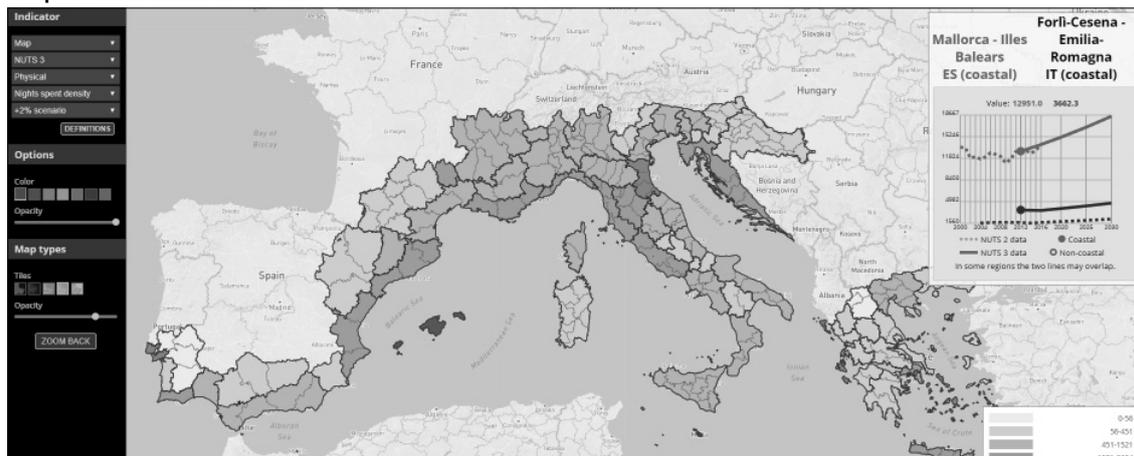
### 2. Social indicators as:

- Tourism guests intensity - as the ratio of the total number of arrivals at tourist accommodation establishments (number of guests), per year, relative to the total permanent resident population of the region.
- Tourism nights spend intensity – as the ratio of the total number of nights spent at tourist accommodation establishments, per year, relative to the total permanent resident population of the region.
- Accommodation intensity of number of bed places – as the ratio of the total number of bed places relative to the total permanent resident population of the region.

### 3. Economic indicators as:

- Occupancy rate – as the ratio of the average number of nights spent at tourist accommodation establishments, per day, relative to the number of bed places.
- Average length of stay – as the ratio of the total number of nights spent at tourist accommodation establishments, per year, relative to the number of arrivals at tourist accommodation establishments.

Figure 3  
ShapeTourism simulation tool



Source: <http://www.shapetourism.eu/main-output/shapetourism-simulator/>

This tool is easily accessible for all users and provides comparable information for all MED regions, information for coastal and non-coastal areas, historic information and future scenarios with different time horizons (Figure 3). The scenarios are based on tourism density, tourism intensity, occupancy rate, average length of stay on future courses of demand and supply tourism variables according these simulation scenarios:

- +1% scenario: if the number of guests / nights spent / bed places increases by 1% per year
- +2% scenario: if the number of guests / nights spent / bed places increases by 2% per year
- +5% scenario: if the number of guests / nights spent increases by 5% per year
- -1% scenario: if the number of guests decrease by 1% per year
- Past pattern: if the past pattern will continue in the future
- Avg. rate of change: if the average rate of change of last 4 years will continue in the future

This tool allowed policy-makers, tourism stakeholders and tourism facilities to evaluate the future sustainability of their tourist areas described with a regional (nuts-2) level, province (nuts-3) level, coastal or non-coastal territory.

## 5. Conclusions

This paper illustrates the experience of the ShapeTourism project concerning the creation of a new version of a tourism observatory including a number of developments pertaining to the type of data used, as well as creating indicators with open and official data and user-generated content regarding as it relates to user experience. In addition to that, the data from 52 Mediterranean areas has been analysed and regionalized to obtain key performance indicators regarding attractiveness, competitiveness, sustainability and web reputation using a World Economic Forum report as a guideline. Furthermore, the tool was designed not only for monitoring and analysis purposes, but also for megatrends forecasting and to evaluate density, intensity and the pressure of tourism. The results show that any user (i.e. policymaker or private operator) can obtain a set of key indicators regarding tourism destinations

and use the outputs for benchmarking, discover similar destination or best practice territories as well as having a tool that can support the evaluation of plans for development or preservation. Making sense of indicators through the simulation tool enables private and public stakeholders to interact and create scenarios of sustainable growth and move more easily in exploring possible future contexts distinguishing their destinations. From this experimentation a series of considerations also emerge for future research in the field of tools for tourism monitoring and setting up tourism observatories. First, ShapeTourism could be used not only as a monitoring tool, able to give insights on how management and governance positively or negatively impacts the tourism industry, but also as a benchmark device between destinations. The benchmark through the described model will support destination management organizations to compare similar destinations (in the same tourism life cycle stage), with the same primary resource able to attract tourists, similar tourism products, small and big destinations in a similar context (e.g. in a Region or a country), different types of tourism offerings and destinations (e.g. eco-tourism and cultural tourism) as well as natural territory and urban destinations. Secondly, the ShapeTourism model presented here lays the groundwork for a methodological and operational approach in relation to two aspects in particular: how to support stakeholders in intercepting possible future scenarios and how to operatively include them in the analysis. However, further inclusion methods can be easily implemented. For example, by regularly establishing working groups with stakeholders, it would be highly advantageous that some issues of study were advanced directly by them. Frequently, regarding tourism observatories that are currently considered state-of-the-art, the topics of study are decided with a top-down approach, increasing the chances of investing in research that is not strictly useful to the industry. Thirdly, as already mentioned, the ShapeTourism observatory is a component which must form a dialogue with the private sector and tourism companies. This could be a two-way conversation: the indicators generated by the SITDS must be used to allow the management of a destination to interpret the results obtainable from the simple use of the outputs supporting a strategic plan and tourism development. The second way is how this data can be queried by stakeholders in order to understand the methods and activities that can be used to take advantage of the different indicators or scenarios in order to elaborate the appropriate marketing policies, or in line with sustainable tourism strategies. Finally, this observatory, after an easy and quick update in terms of data and indicators, could be a valuable tool to monitor the substantial changes that result from the Covid-19 pandemic that have caused a decrease in international flows, or in some cases, a total cessation. Offering an overview on different tourism dimensions the ShapeTourism observatory could monitor the new tourism performance levels by delivering new destination rankings on structural insights (official indicators) and perceived insights (online reputation indicators). This could be especially true through the use of the ShapeTourism simulation tool that has been built using historical data and aims to predict the future (not considering the global lockdown due to the pandemic). This tool will be fundamental in the recovery phase, when destinations need to have sustainable and destination-developing goals to regain ground in the global tourism market.

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