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Tourism Competitiveness in the Digital Economy

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Introduction

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Special Issue on Tourism Competitiveness in the Digital Economy

For the last decades, tourism industry has become one of the most important economic sectors worldwide, attending to its size and also to its growth rates. Tourist arrivals have reached a record figure of 1,322 millions of people in 2016, according to the last figure given by the barometer of the World Tourism Organization, presenting a 7% of interannual growth rate. For a few years now many institutions and experts have announced changes in the type of the tourism that must be promoted from the destinations, especially from the most affected by mass tourism/ over tourism, focusing on sustainability and digitalization. These topics go hand-in-hand with the transformation that has also become necessary in the global economy of the 21st century. The tourism industry has experienced an ongoing adaptive process, which has been accelerated during the last twenty-five years by the appearance of Information and Communication Technologies (ICTs) and the problems derived from climate change.

Obviously, the distribution of tourism impact is not equitable among countries or regions. Moreover, the «transformation» derived from the ICTs goes beyond only concerning the tourist flows from its origin but starts stimulating drastic changes in the destination too, mainly in the form of smart tourism destinations. These changes are promoted fundamentally to improve the quality of life in the cities, as well as its profitability and sustainability based on innovation and new technologies. These facts make it essential to employ a regional perspective on any analysis about possible future directions of the sector. All of this, linked to necessity of identifying the challenges and the opportunities the tourism sector is facing in the next years was what motivated Journal of Regional Research to present a monographic issue on tourism. ICTs, climate change and the rise of collaborative economy, amongst other, have posed plenty of questions about the future of one of the most important economic activities in the world.

The elaboration of this monograph, including the tasks of selecting the most relevant topics that had to be addressed and identifying which teams, in an international context, should be entrusted to make the most relevant and disruptive contributions, has required several months. The coordination of the issue has been developed by **María Jesús Such Devesa (University of Alcalá)*, Ana Ramón Rodríguez (University of Alicante)** and **Patricia Aranda Cuéllar (University of Alcalá)**. After the

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evaluation and revision duties were applied to all contributions, this monograph is finally composed by ten articles, than can be categorized in three groups:

1. Tourism competitiveness problems, addressed by different regional perspectives such as Spain competitiveness model, the accessibility importance in the tourism competitiveness index, the over tourism implications for a case study or the need of public support for talent and entrepreneurial management.
2. Innovation and its different applications in the tourism prices model.
3. Smart Tourism Destinations (STDs), approached from various points of view, including mobility and georeferenced information, the existence of a synergy between smartness and sustainability or the requirements for the establishment of smart tourism regions.

It is a matter of placing the tourism sector in front of the challenges it is currently facing. The majority of the changes that have taken place in tourism are linked to the digital economy advances and to the way the sector copes with them. In this context, Spain as the first tourist destination in terms of tourism competitiveness, is risking its future leadership. The relevancy of the tourism sector in the Spanish economy, its resistance to the economic crises and its enormous potential, joined to the complexity of the tourism competitiveness concept, encourage to think and act on the routes of competitiveness improvement of the sector. In this frame, it is appropriate to question if the changes in the Travel & Tourism Competitiveness Index (TTCI) methodology in the last report are able to reflect destinations performance better or if it should be necessary to add other criteria that, in the current age of the knowledge, is capable of approximating reality better.

In this context, **Luis Moreno Izquierdo**, **Ana Ramón Rodríguez** (University of Alicante-Spain) and **María Jesús Such Devesa** (University of Alcala-Spain) present an article titled «The challenge of long-term tourism competitiveness in the age of innovation: Spain as a case study» in which the question of whether the innovative deficit that accompanies the tourism sector on a global scale also occurs in the competitive tourism leader in the world (Spain), and if progress is being made to guarantee the future leadership of its destinations is posed. For this, the innovative framework of the country in its European context is analyzed, emphasizing the innovative intensity of the most important tourist regions. Spanish tourism companies are also analyzed in comparison with those that operate in other sectors and their ability to innovate with respect to them. Formulas for the generation of tourism industries are presented, these are capable of assimilating and creating innovation with the idea of facing the transformations that the sector is currently experiencing with the appearance of intelligent tourism destinations, the collaborative economy, and other disruptive changes such as artificial intelligence. Meeting these challenges will mean going through a series of more specific policies and strategies that allow the promotion of Smart Tourist Destinations and the development of a more digital and responsible economy that takes as a reference the collaboration between citizens and tourists who live in the destination.

It is in this context of change and innovation of the destinations that the so called sharing economy arises, with the purpose of efficiently exploiting goods and services between equals, taking advantage of the Internet, the digital economy setting and the transformations that aim towards the intelligent destinations. Both concepts, «sharing economy» and «smart tourism destinations» are of interest for being precisely two of the key elements that define the shift from the traditional destinations to a new concept of them in which the relationship of the tourist with the surrounding is completely transformed.

The growing concern present in recent state of the art and the firm commitment adopted by the World Travel & Tourism Council (World Tourism Organization) to act to strengthen investigation about tourism massification emphasize the importance of including the overtourism challenge in this Special Issue. Even the European Parliament itself and the European Commission show a clear concern about this problem for the competitiveness of destinations in a period not too long. Cities such as Venice, Barcelona, Palma, Berlin, Amsterdam, Machu Picchu (Peru), Phi Phi (Thailand), Reykjavik or New York, among many others, are some of the destinations on a global scale that already suffer a movement contrary to the tourist activity regarding the problems derived from its activity.

In detail, the contribution made by **Ana Trancoso** (Universidad de Alcalá) focuses on how cruise ship tourism impacts the island of Venice. From a socio-cultural perspective analysis, the conversion of Venice in one of the Heritage in Damage UNESCO sites in 2016 is studied. Cruise ship tourism is one of the triggers that truly helps to better understand the development of this overtourism phenomenon in Venice. In her work, «Venice: The problem of overtourism and the impact of cruises», the author exposes how cruise ship tourism creates a great impact in the city, comprising relevant externalities such as pollution, noise, smoke, alteration of heritage and the environment, endangerment of citizenship, architectural and cultural heritage and the environment.

Stimulating a tourism innovative sector, capable of taking advantage of all its competitive advantages and its diversification and attraction potential. Promoting an innovative environment that generates knowledge, talent, able of catching the best ideas, the best practices and ready to diffuse them in the whole productive system. It is necessary to adopt a digital strategy in the productive sectors in which the technology is capable of driving productivity. What really matters is the leadership on sustainability by being able of training human resources and spreading knowledge.

Following this, the paper presented by **Saúl Cobo Soler** (SEGITTUR), **José María López Morales** (University of Alcala-Spain), **Andrés Fernández Alcantud** (SEGITTUR) and **Marta Santamaría García** (SEGITTUR) show how entrepreneurship based activities and its associated competitive advantages are potential solutions to the key challenges the Spanish tourism sector is facing in the nearest future. Governmental and public initiatives on entrepreneurship, human capital and talent are key for our country to strengthen a sustainable tourism sector. In this work, titled «Public support for entrepreneurship, human capital and talent in the context of Span-

ish tourism», a profound review of these previously mentioned effects is presented, along with a regional analysis of regional public policies related to the entrepreneurial tourism activities in Spain, showing important concentration of public efforts in some destinations and regions and also an important bias towards technology-related enterprises, in line with the most recent literature, that presents innovation and new technologies as key elements to ensure a future.

An important part of tourism recent literature discusses which are the key elements for destination competitiveness. Synergies with the development of smart destinations and their sustainability are pursued but there is no international agreement concerning the competitiveness measurement. **Natalia Porto** (National University of La Plata-Argentina), **Ana Clara Rucci** (National University of La Plata-Argentina) and **Matías Ciaschi** (National University of La Plata) in «Tourism accessibility competitiveness. A regional approach for Latin American countries» seek to establish the importance of an adequate accessibility to tourism sites represent an increase in international tourism flows for 17 Latin American countries for the 1995-2014 period. Through the elaboration of an accessible tourism index and a gravitational panel data model with fixed effects, accessibility is acknowledged as an important aspect in explaining tourism international demand.

At a sectoral level, technology and innovation are transforming each and every one of the touristic areas, and phenomena that we currently experience related to the collaborative economy should not surprise tourist destinations. If in the early 2000s technology was decisive for low cost airlines to be more competitive than traditional airlines, today the same digital revolution allows models such as Airbnb or Uber have a greater impact than traditional models in the accommodation sector. The existence of technology that models prices facilitates the understanding of this phenomenon of collaborative economy and allows us to obtain a different perspective on its impact on the sector.

All tourism-related stakeholders are implied in the digital transformation of the sector. Literature is recently identifying frameworks to better understand the dynamic of online prices, based on demand and supply, as well as on the geographical location of the hotels. The work presented by **Manuela Pulina** and **Valentina Santoni**, from Universitá di Sassari & CRENoS (Italy), titled «Hotel online pricing policy: A review and a regional case study» reviews the most important literature concerning online hotel pricing policy. It classifies strategies from three points of view: demand, supply and regional characteristics. Electronic word-of-mouth (e-WOM) and reputation are key aspects from the demand side whilst the supply side does not present any digital transformation in its competitive scheme. This paper is complemented by an analysis on how hotel online policy is influence by accessibility and mobility within regions.

In line with innovation and technology use in the tourism sector applied to online rental prices, the paper titled «The use of artificial intelligence in price maximisation in the tourism sector: its application in the case of Airbnb in the Valencian Community» by **Luis Moreno Izquierdo**, **Galina Egorova**, **Álex Peretó Rovira** and **Adrián Más Ferrando**, from Universidad de Alicante (Spain), shows how the application of artificial intelligence models in price optimisation for tourism rental sector is significantly

better than the use of traditional procedures. This work uses Airbnb data to reveal how machine learning optimises performance when the existence of a vast number of accommodation offerers meets the same enormous amount of tourists. These two conditions require optimisation of the price of the products but also and optimisation of the utility demand in order to provide the most appropriate selection for the tourist.

Collaborative economy can be understood as a continuation of the technological revolution that the tourism sector is experiencing, whose transversal nature, together with the high volume of demand, allows it to be a testing ground of the application and development of numerous technological advances. Undoubtedly many questions are opened about regulation, the future or the consequences for traditional sectors and impact on tourism, although it is certain that the collaborative economy, in one form or another, will continue its pathway towards consolidation in the tourism market, and in special with the reinforcement of smart tourist destinations.

The work titled «Smart Tourism Experiences: conceptualisation, key dimensions and research agenda» by **Francisco Femenia-Serra** (University of Alicante-Spain) and **Barbara Neuhofer** (Salzburg University of Applied Sciences-Austria) explore how tourists' experiences are potential focal points of smart tourism development. Thus, Smart Tourism Experiences (STEs) need a more profound study to develop a clear and agreed definition of what they represent. This paper explores a comprehensive analysis of the literature to propose a new conceptual model for this STEs, in addition to an agenda for further research. Two examples are given of how destination and companies should promote these, explored from a marketing and strategic viewpoint.

Innovation and knowledge, applied to tourists' activity will be key to give answer to the competitive demands in the destinies of the 21st Century. Knowledge acquires more value in the current era as an inexhaustible resource, able to promote innovative solutions to issues such as overtourism or the coexistence and management of spaces between residents and tourist activities. Tourism destinations must be understood as flexible and dynamic entities, whose life cycles evolve from presenting sharp growth rates to a maturity level that can be revitalized or led to extinction. Indeed, destinations that do not know or are not able adapt to the changes that occur in the environment, end up starting a competitive decline that, besides being accompanied by a decrease in tourists, shows other problems as a minor profit return per visitor or the decline of economic zones.

The intensive use of technology that involves the implementation of an intelligent tourist destination, will allow the continuous measurement of aspects linked to sustainability that, until now and in the absence of such technology, were difficult or simply impossible to measure, and therefore, manage. Precisely, in this management of information, derived from new data sources, is where the response to the problems derived from overtourism and the doubts generated by the emergence of the collaborative economy is framed in many occasions.

José Francisco Perles Ribes and **Josep Ivars Baidal**, from University of Alicante (Spain), suggest a combination of two of the most important topics present in current literature and in this Special Issue: smartness and sustainability. The combi-

nation of these two concepts permits the achievement of sustainability based on the creation of a smart tourism background for destinations. Three key steps are presented in this work, titled «Smart Sustainability: a new perspective in the sustainability tourism debate», with a view to better understand this synergy: an appraisal of sustainability concept applied to tourist destinations, an evaluation of the new possibilities that the smart destination perspective offers to rethink sustainability and the proposal of the smart sustainability model, which comprises principles of the circular economy and imposes limits to growth.

The sustainability of destinations is currently at stake and is feasible that new technologies and artificial intelligence are their only tools for becoming competitive destinations and, therefore, sustainable. In many cases, a destination by itself can not afford the conversion to an intelligent tourist destination, for several reasons such as the high costs involved or the lack of enough infrastructure. For this reason, transcending territorial areas and reinforcing cooperation networks between adjoining cities or towns to create smart tourism regions is the key.

Smart tourism destinations are rising important interest lately, not only related to individual smart destinations but expanding quickly towards smart tourism regions. The work carried out by **Ulrike Gretzel**, from University of Southern California (USA), shows the important bias present in the current literature, and also in the practice, towards cities, explaining the reasons why it is not possible to implement in a direct line smart cities principles to smart tourism regions. This work, titled «From Smart Destinations to Smart Tourism Regions» sustains that these smart tourism regions have latent experiences that are substantially different to existing ones, providing significant synergies but needing a more thorough and specific development than smart cities or individual destinations.

According to previous affirmations, smart tourism development requires an important amount of mobility and georeferenced information. If the preceding article showed a supra-local framework of smart destination, the following contribution adopts the local scope, namely the tourist micro-destination, as subject of study. The key value of geolocated information is that allows the delimitation of tourist zones or neighborhoods.

For this purpose, **Raúl Hernández** and **Yurena Rodríguez** from University of La Laguna, Spain, present methodology for the determination of tourism destinations at a local scale on the work titled «Foundations and Relevance of delimiting local tourism destinations». The identification and reference of the most crowded areas of a big city and the delimitation of the different neighbourhoods are currently key aspects for evaluation, planning and management of tourism activities but yet there are few applications in the touristic field. This work also illustrates with an example of the application of these criteria to the Canary Islands.

On a final note, presenting this tourism innovation monograph is a valuable opportunity to reunite all upcoming challenges and put the focus on where the tourism sector is headed and what specific problems are defying destinations as we currently know them. These challenges are characterized by innovations both on this sector but also on cross cutting technologies, disruptions or new forms of consumption.

ARTICLES

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Section ARTICLES

Journal of Regional Research Investigaciones Regionales

The challenge of long-term tourism competitiveness in the age of innovation: Spain as a case study

Luis Moreno-Izquierdo *, Ana Ramón-Rodríguez *, María Jesús Such-Devesa **

ABSTRACT: This article questions whether the innovation deficit observed in the tourism sector on a global scale also characterises the world's leading power in terms of tourism competitiveness and whether Spain is taking the right steps so as to guarantee the future leadership of its destinations. Spain's innovative framework will be analysed in its European context, placing emphasis on the innovative intensity of the most important tourist regions. Spanish tourism companies and their capacity for innovation will also be studied in relation to those operating in other sectors. Formulas for generating tourism industries capable of assimilating and creating innovation will be proposed as a way of tackling the transformations that the sector is currently experiencing with the emergence of smart tourism destinations, the sharing economy and other disruptive changes, such as artificial intelligence.
It is important to take a long-term perspective of competitiveness in which innovation and digital transformation have become the centre of political, social and corporate action in the sector. Meeting these challenges will mean the implementation of a series of more specific policies and strategies that will foster Smart Tourist Destinations and the development of a more digitalised and responsible economy in which the collaboration between citizens and tourists within the destination is the frame of reference.

JEL Classification: O32; L83; R1.

Keywords: competitiveness; sustainability; innovation; tourism intelligence; overtourism; digital economy.

El reto de la competitividad turística a largo plazo en la era de la innovación: España como caso de estudio

RESUMEN: Este artículo cuestiona si el déficit de innovación observado en el sector turístico a escala global también caracteriza la capacidad de liderazgo en lo que respecta a competitividad turística, y también si España está dando los pasos

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adecuados para garantizar el liderazgo futuro de sus destinos. El marco de referencia de la innovación española será analizado en su contexto europeo, haciendo énfasis en la intensidad de innovación de las regiones turísticas más importantes. Las empresas turísticas españolas y su capacidad innovadora también serán analizadas, en relación a otras que operan en sectores distintos. Se harán propuestas para estimular la generación de industrias turísticas capaces de asimilar y crear innovación, como una manera de abordar las transformaciones que el sector está experimentando en la actualidad con la emergencia de los destinos turísticos inteligentes, la economía colaborativa y otros cambios disruptivos, como la inteligencia artificial. Es importante adoptar una perspectiva de largo plazo de la competitividad en la cual la innovación y la transformación digital se conviertan en el eje de las acciones tanto políticas como sociales y corporativas del sector. Enfrentar este desafío supondrá la implementación de una serie de políticas y estrategias más específicas que, a su vez, fomentarán los Destinos Turísticos Inteligentes y el desarrollo de una economía más digitalizada pero también más responsable en la que la colaboración entre ciudadanos y turistas dentro del destino sea el marco de referencia.

Clasificación JEL: O32; L83; R1.

Palabras clave: competitividad; sostenibilidad; innovación; inteligencia turística; masificación turística; economía digital.

1. Long-term tourism competitiveness, leadership and innovation

There is no doubt that today tourism has become consolidated as one of the largest and most rapidly growing economic sectors in the world. International tourist arrivals broke records in 2016 with a total of 1,322 million people, according to the UNWTO World Tourism Barometer, 7% higher than in 2015 (WTO, 2018). According to the same organisation, tourism now accounts for 10% of GDP on a global level, 7% of total international trade and 30% of world service exports, exceeding the value of exchanges of oil or cars, for example. But, going beyond the figures, the impact of tourism generates a series of benefits for the development of the destinations, thanks to its capacity to create employment and reduce poverty (Samini and Sadeghi, 2011; Schubert, Brida and Risso, 2011. It also provides an alternative for diversifying the economic base of a region (Gibson, 1993; Porto, 1999, Perles-Ribes *et al.*, 2017), and it serves as a mechanism for converging developing countries, where tourism constitutes one of their main sources of income.

The distribution of the tourism impact is not equal on a global level and the indicators of tourism competitiveness can be used to explain both the movement of people and the economic performance of the sector. Generally speaking, the increase or decrease in the market share of exports —in this case, the volume of tourists— is used as the indicator par excellence to explain the competitive variations in the great majority of sectors in terms of the national and international trade of most industrial goods and services (Perles, Ramón and Sevilla, 2014). We can intuitively understand

competitiveness as a relative and multidimensional concept in which countries, companies or destinations seek to improve their products to position themselves above their rivals. It is a zero-sum game in which there is a limited distribution of the market and all players fight for the largest possible volume of customers and profits.

However, there are some issues that prevent the perfect application of the business concept of competitiveness to the reality of tourism territories (Perles-Ribes, 2016). For example, the emergence of new exotic destinations (particularly in developing countries) which, with small investments, can experience a rapid convergence in the early stages of growth (which slows down as the destinations mature). Or the tourism carrying capacity due to physical or sustainability reasons, preventing an infinite maintenance of market share while the number of tourists increases on a global scale.

Tourism competitiveness, therefore, should be addressed from several different perspectives (Spence and Hazard, 1998). Consequently, there is a broad and productive academic debate (Dwyer and Kim, 2003; Crouch and Ritchie, 2003; D'Hauteserre, 2000; Hassan, 2000; Heathe, 2003; Croes, 2011, among others). These studies seek to apply the knowledge on the holistic competitiveness of industries (Porter, 1990) to the case of tourist destinations, searching for the parameters that are best able to explain the movements and profitability of the destinations. Accordingly, the definition of tourism competitiveness is associated to concepts such as «well-being» or «sustainability» (Crouch and Ritchie, 1999), and does not represent an end in itself but an intermediate objective for reaching economic prosperity and well-being in the territory as a whole, as illustrated in the integrated model proposed by Dwyer and Kim (2003). In this concept of competitiveness, as well as attracting visitors, a satisfactory service is required with memorable experiences and a clear profitability for the destination and its residents from a sustainable point of view. Therefore, human resources and knowledge constitute two key elements of competitiveness.

The case of Spain is fairly paradigmatic in this double way of measuring competitiveness. With more than 82 million tourists in 2017, it is the second country in terms of international arrivals from all over the world, with total international tourism receipts of almost 90,000 million euros. The direct and indirect impacts together account for more than 14% of the wealth generated in Spain and the job positions in the economy (WTTC, 2018)[1]. These statistics have broken the country's record. However, with sufficient historical perspective it can be observed that the evolution of Spain's tourism competitiveness, measured through its participation in the global market, is characterised by a decreasing trend which can be explained by new competing destinations and the mature state of the country's principal tourism product (Perles-Ribes, J. F., Ramón-Rodríguez, A. Moreno-Izquierdo, L., and Torregrosa-Martí, M. T., 2016).

But this natural negative evolution associated to mature destinations such as Spain should also be reflected when we examining tourism competitiveness from a multidisciplinary perspective. Thus, the Travel and Tourism Competitiveness Index

[1] *https://www.wttc.org/-/media/files/reports/economic-impact-research/countries-2018/spain 2018.pdf.*

(TTCI) of the World Economic Forum (WEF, 2017), the most widely accepted indicator in an international level, considers Spain as the country with the highest tourism competitiveness in the world. In order to reach these conclusions, aspects related to culture and the environment and policies aimed at the sector and the tourism infrastructures are considered; aspects in which Spain is clearly a global leader. However, other areas related to the generation of companies, innovation or the training of human capital are also taken as elements of the competitiveness of destinations, in which Spain is not so strong.

Over the next few years, Spain will need new products to revitalise itself and increase its profitability and maintain its competitive indexes in the face of the emergence of new destinations. This will require an innovative ecosystem that fosters the development of tourist knowledge as an unlimited resource and its transfer between the agents involved (Ramón and Pedreño, 2009). The different debates reveal that innovation seems to be the only response to aspects such as the changes in tourist preferences, the digitalisation of our society, the emergence of the sharing economy or the impact of the sector on the residents (Perles-Ribes, Ramón-Rodríguez, Vera-Rebollo and Ivars-Baidal, 2017).

This need for innovation is evident in any sector of the current knowledge society. In the tourism industry, for many years, authors such as Hjalager (2002), Ottenbacher (2007), Shanker (2008) or Baggio and Cooper (2010) have highlighted the competitive improvements of the new technologies: the increase in information in terms of both supply and demand, an increase in communication between agents, greater transparency or the possibilities of delocalising and controlling production and services, etc. According to many authors, such as Inkpen (1998), Buhalis (2003), Sevki and Rifat (2006), Liao and others (2010) or Werthner and Klein (2005), innovation is a key aspect for understanding the growth in tourism over the last few decades and its adaptation to the new needs of the demand, thanks to e-commerce or the greater global visibility of companies and destinations, among other factors. However, technology has also improved the processes of tourism companies in terms of management or distribution (Longhi, 2009), or the interaction between users (B2C) and companies (B2B) Hojeghan and Esfangareh (2010).

Nonetheless, it should be noted that this question relating to tourism and innovation is not new. More than two decades ago, Poon (1993) identified the difference between traditional demand and new tourists (subsequently called 2.0, referring to the millennial generation). Since then, even though digital technologies have constituted a transforming kingpin in destinations, with a total impact on the sector accounting for billions of dollars, the tourism industry has not fully exploited its capacity to innovate (Stamboulis and Skayannis, 2003). Based on an extensive literature review, Cooper (2006) highlights some of the causes of this insufficient management of knowledge in tourism:

— Stagnation in terms of incorporating academic research into the sector, which includes a failure to adapt studies to the reality of the sector and the recommendations for their application to the industry.

— The average size of the tourism companies (mainly small and medium-sized firms), with a low capacity for innovation. Although small companies are also capable of innovating, as noted by Hjalager (2002) or Camisón and Monfort-Mir (2012), only large companies or franchises have been able to generate their own innovation and develop new products. According to Williams and Shaw (2011), large hotels are best at absorbing and applying innovation, while King and others (2012) also refer to the greater ease with which large tourism companies innovate with respect to the deficit observed in the small and medium-sized firms.
— A very traditional and family-based sector, far-removed from the idea of development and innovation in the design of their business model. While in other sectors —particularly technological sectors— companies usually cooperate and support one another, in tourism they operate very independently. According to Aldebert and others (2011), tourism is made up of a series of activities that are highly dispersed, not only in nature, but also in terms of time and space, and they need to be dynamically combined so as to obtain a greater profitability.
— Professionals in the sector are not highly knowledgeable in the technological aspects, having studied vocational degrees (tourism-based) which do not include subjects that are essential for the future of the companies, such as computing or statistics. This hinders the generation of new tourism business models based on innovative ideas.

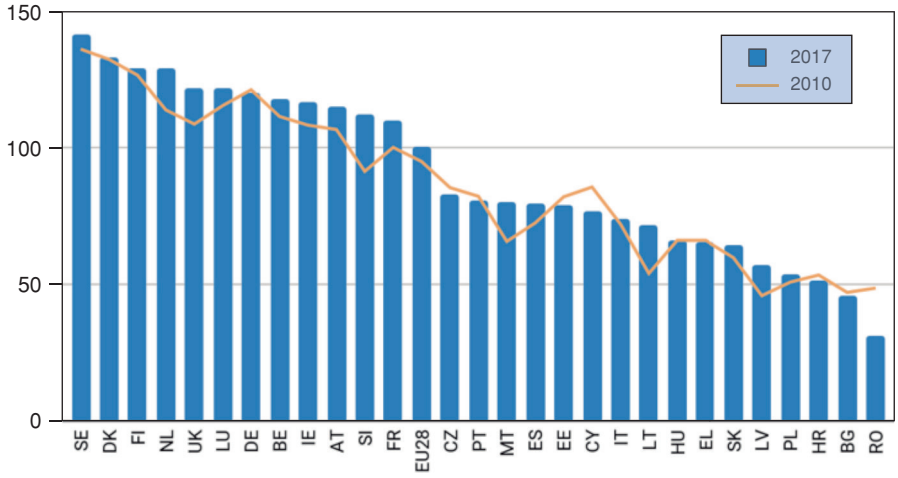
The question addressed in this article is whether this innovation deficit that characterises the tourism sector on a global scale is also prominent in the world's leading power in terms of tourism competitiveness, and whether Spain is taking the necessary steps to guarantee the future leadership of its destinations. To do this, first, Spain's innovative framework will be analysed in its European context, placing an emphasis on the innovative intensity of the most important tourist regions. Subsequently, Spanish tourism companies and their capacity for innovation will be studied in relation to those operating in other sectors. Finally, formulas for generating tourism industries capable of assimilating and creating innovation will be proposed as a way of tackling the transformations that the sector is currently experiencing with the emergence of smart tourism destinations, the sharing economy and other disruptive changes, such as artificial intelligence.

2. The innovative framework of Spain within the European context and the deficit in the tourism sector

One of the principal problems of the Spanish economy resides in its low capacity for innovation which not only affects the emergence of new leading sectors in the digital economy, but also the renovation of traditional industries, such as tourism. The European Innovation Scoreboard, created by the European Commission (2018), places Spain in the 16th position of 28, with no variations with respect to 2017. As we

can see in Figure 1, this position is a long way behind the leading countries in terms of innovation. Sweden (SE), Denmark (DK), Finland (FI), the Netherlands (NL), United Kingdom (UK) and Luxembourg (LU). Spain (ES), meanwhile has a middle-low position, together with other moderately innovative countries, such as Portugal (PT), Malta (MT), Estonia (EE), Czech Republic (CZ), or Cyprus (CY). In order to determine these values, different indicators have been used which have been gathered from different sources ranging from the formation of human resources or the attraction of international researchers to a country, including business investment in R&D, financing capacity or the international trade of technological products, among many others.

Figure 1. Value in the innovation index of the European Innovation Scoreboard (EU28 in 2017 = 100)



Source: Eurostat.

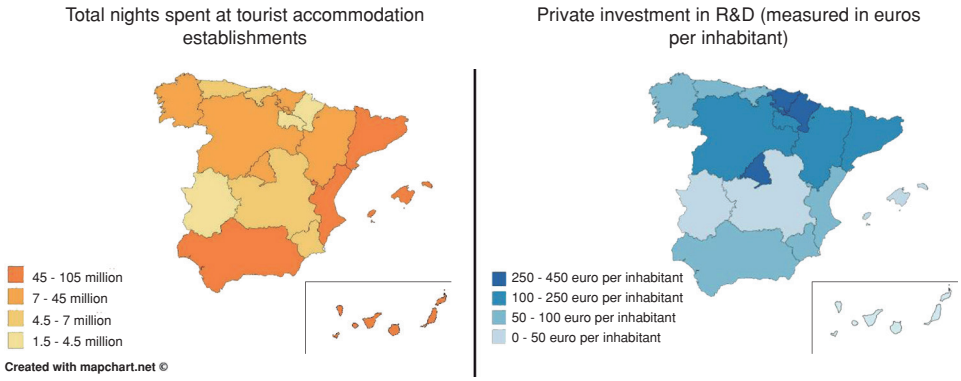
Relatively speaking, according to the afore-mentioned index, Spain has only closed the gap with the European average by 3% in recent years from 76% to 79%, with a series of elements that are clearly lagging behind, such as the attraction of foreign researchers, collaboration between companies to create innovative projects, the number of patent applications, technological exports or employment in highly innovative areas. But, undoubtedly, the greatest problem of the Spanish economy with respect to innovation is the lack of innovation in companies, with an absolute absence of new product design, a very low percentage of public and private expenditure in R&D and a very low incidence of the creation of new companies and entrepreneurial activity.

During the period called the «Spanish economic miracle», a great opportunity was lost to revitalise strategic sectors such as tourism, highly focused on the development of its property dimension. So while in Spain second residences multiplied, the

companies that had reinvented the relationships between tourism supply and demand (Booking, Airbnb, TripAdvisor, Ryanair,...) emerged in innovative environments (the United Kingdom, the Netherlands, Ireland, the United States,...) (Moreno-Izquierdo and Pedreño-Muñoz, 2017). This was not the case in other countries, such as Sweden, which had known how to maintain its specialisation in sectors such as construction or automobiles, while promoting any area related to science or technological production (ICTs, energies, new materials,...). Germany also combined its traditional industries, such as pharmaceuticals or cars with other eminently innovative sectors, such as new materials, aeronautics or energy (see the Report on Innovation and Research by the European Commission 2017).

Spain, meanwhile, seemed to be enjoying a clear comparative advantage in the tourism sector due to its climate and beaches. Despite the efforts made by the government, the policies for innovative development are insufficient or very slow and the tourist regions are not advancing in the right direction, as we can see in Figure 2, which shows how the principal Spanish tourist regions, in terms of regulated overnight stays (Catalonia, the Region of Valencia, Andalusia and the Balearic Islands), have a lower level of private investment in R&D than other regions less specialised in tourism, such as the Region of Madrid, the Basque Country or Navarre.

Figure 2. Impact of tourism and investment on innovation in the Spanish regions



Source: Eurostat.

In the European context, the situation is similar. In 13 of the 20 most important tourist regions of Europe, private investment in R&D is below the national average. In the case of countries with a low level of innovation, such as those in southern Europe, the lack of innovation with respect to the European average is even more concerning, as we can see in Figure 3. However, there are different nuances which should be highlighted.

Figure 3. Investment in R&D of the most important tourist regions in Europe

Region	*Total nights spent by tourists in the region (millions)*	*Private R&D investment in the region measured in euros per inhabitant*	*% of private investment in R&D with respect to the national average (indicated in parentheses)*	*% of private investment in R&D with respect to the EU28 average (EU28 average=381.7)*
Canary Islands (ES)	102.7	16.9	11.34% (149)	4.42%
Catalonia (ES)	79.8	239.7	160.87% (149)	62.79%
Jadranska Hrvatska (HR)	74.2	16.8	37.00% (45.4)	4.40%
Île de France	71.2	1,067.5	223.5% (477.6)	279.6%
Balearic Islands (ES)	69.9	11.6	7.78% (149)	3.03%
Andalusia (ES)	66.2	60.2	40.40% (149)	15.77%
Veneto (IT)	65.4	229.2	108.11% (212)	60.04%
Prov-Alpes-Côte d'Azur (FR)	51.8	460.1	96.33% (477.6)	120.5%
Rhône-Alpes (FR)	49.1	586	122.7% (477.6)	153.2%
Region of Valencia (ES)	47.4	83.8	56.24% (149)	21.94%
Tuscany (IT)	44.2	210	99.05% (212)	55.01%
Emilia-Romagna (IT)	37.8	427.8	201.8% (212)	112.1%
Lombardia (IT)	37.2	323.2	152.45% (212)	84.67%
Tyrol (AT)	36.5	842.2	96.32% (874.3)	220.6%
Oberbayern (DE)	35.1	1,787.6	238.1% (750.7)	468.3%
Languedoc-Roussillon (FR)	34.1	181	37.96% (477.6)	47.41%
Aquitaine (FR)	32.9	283.8	59.42% (477.6)	74.35%
Lazio (IT)	32.1	187.4	88.39% (212)	49.09%
Provincia Aut. di Bolzano (IT)	31.3	196.7	92.78% (212)	51.53%
Berlin (DE)	30.9	524.2	69.82% (750.7)	137.33%

Source: Eurostat.

First, of the regions observed, there are three which are particularly noteworthy with a higher R&D deficit than the rest: The Balearic Islands, the Canary Islands and the Adriatic Coast of Croatia. When compared with the surrounding countries, none of these regions reach even 5% of the average private investment in R&D of the European Union of the 28 countries (EU). These are followed by Andalusia, (16% of investment with respect to the EU28 average) and the Region of Valencia (22%), with a more diverse production fabric. Of the Spanish tourist regions, only Catalonia

—thanks to the boost from Barcelona— exceeds 50% of the average investment in R&D of the EU, although it is still a long way behind the leading countries. Although there are tourist regions with an innovation deficit in other countries, such as Italy and France, the data are much higher than the average of the Spanish tourist regions, which shows that the Spanish tourism sector is lagging behind due to the innovation deficit of the country as a whole.

At the other extreme, regions such as Bavaria, the Austrian Tyrol, the Île de France (region of Paris) or the Côte d'Azur are highly specialised in tourism but this has not prevented a business diversification reflected in private investment in R&D. These regions should constitute models of best practice for the Spanish destinations.

3. Explaining the innovation deficit of the Spanish tourist regions

Among the principal barriers preventing tourism companies from adopting innovations and technology, in the literature we can find certain elements such as the small size of many of these companies —mainly microenterprises—, a low level of professionalisation of the entrepreneurs and the doubts regarding the profitability of the investments (see Perles-Ribes, Rodríguez-Sánchez and Ramón-Rodríguez, 2015). But this fact does not affect all of the regions equally, and the context in which the tourism activity is developed will ultimately determine the commitment of the tourism companies to the renovation of the development.

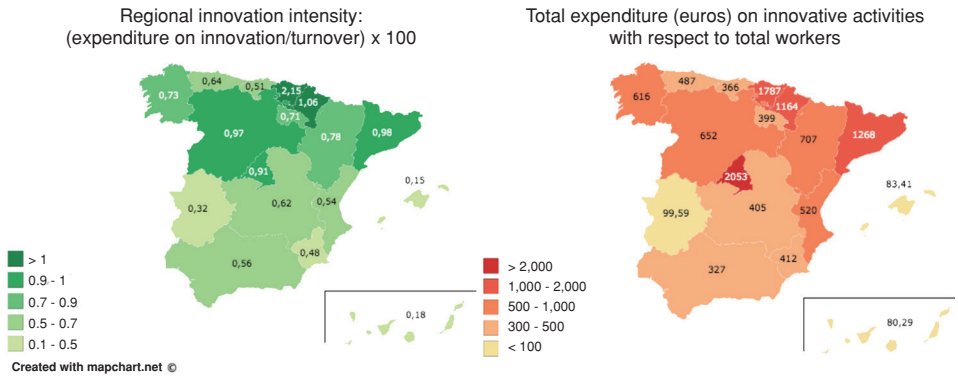
With respect to the types of innovation, Aldebert and others (2011), identify three different types: innovation in the product or service; innovation in the process; innovation in the marketing. This study determines that 70% of total innovation in tourism occurs in the first category (introducing a new product or service onto the market), although with certain nuances: only 21% of product innovation effectively refers to a new product on the market; 79% implies the creation of a good or service in a company but which already exists on the market, or «minor innovations» to improve an existing product (in terms of design, usability, accessibility, adaptability to mobile phones, etc), according to the classification of the authors.

Innovation in processes (implementation of new production, distribution, sales techniques, etc.), represents 20% of innovation in tourism and includes proposals such as the creation of new online distribution systems, tools for hotel management, systems for working in the cloud to save costs and the generation of more information, etc. According to Ubierna and Pérez (2016), organisational innovations are more important than product or process innovations. Finally, innovation in marketing (implementation of new marketing techniques, including communication, user management or the visual redesign of the product) represents the remaining 10% of innovation for tourism companies.

This classification of innovation helps us to understand two things: first, that innovation and competitiveness in tourist destinations not only require the efforts of

the companies in the sector (of any size) but also those of new start-ups and entrepreneurs who contribute a new vision of solutions and improvements; and second, the need for a specialised innovative environment that enables tourism companies to employ professionals and experts in technologies, marketing or design among other fields. In the case of Spain, and based on the Innovation Survey of companies (INE, 2017), once again, we can see the relationship between the Spanish tourist regions and sectors and innovation. First, as shown in Figure 4, of the regions with the highest tourism impact (Andalusia, Catalonia, the Balearic Islands, the Canary Islands and the Region of Valencia), only Catalonia displays an innovation intensity higher than the national average, with the Balearic Islands and Canary Islands in last place. The same result can also be observed when analysing the total expenditure on innovation by companies per wage earner. Figure 5 shows how tourism-related sectors included in the above-mentioned survey (transport and hotel and restaurants) have an investment ratio that is lower than the average of service companies and much lower than the national average. In other words, Spanish tourism companies usually have a lower average degree of innovation than the rest of the economic sectors, which seems to be penalising the regions most specialised in this industry.

Figure 4. Regional differences with respect to the intensity of investment in innovation



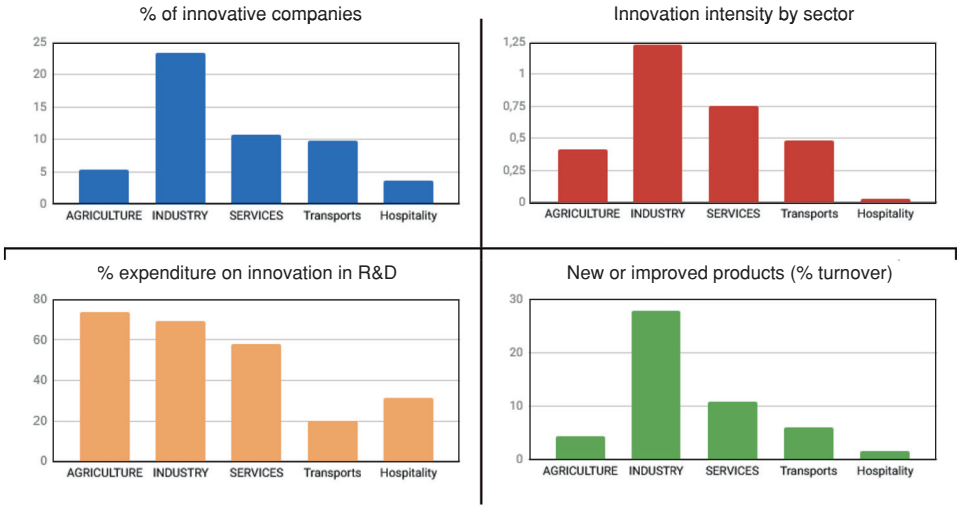
Source: own elaboration based on the Survey on Innovation in Companies 2016 (INE).

Moreover, the average Spanish investment in innovation is also lower than the European Union average. If this situation is not reversed, the above-mentioned Spanish tourist regions, and also the Region of Murcia which also has a sizeable tourism industry, will widen the distance that separates them from the rest of the European territories that understand investment in R&D as a key policy for explaining their growth.

With respect to the type of innovation that is taking place in the Spanish tourism sector, according to Camisón and Monfort-Mir (2012), the innovative focus is on the non-technological aspects, with special emphasis on retail and management innova-

tion. This can be seen in the graph that represents the low turnover derived from new or improved products in the hotel and restaurant and transport sectors. However, as indicated by Adebert and others (2011), it is foreseeable that with future innovations, as in the case of the emergence of the mobile terminal, the tourism industry will adapt its products to new opportunities, as although the tourism sector is not a technological industry, it does know how to update itself, adapting its business models to external innovations (Thomas and Wood, 2014).

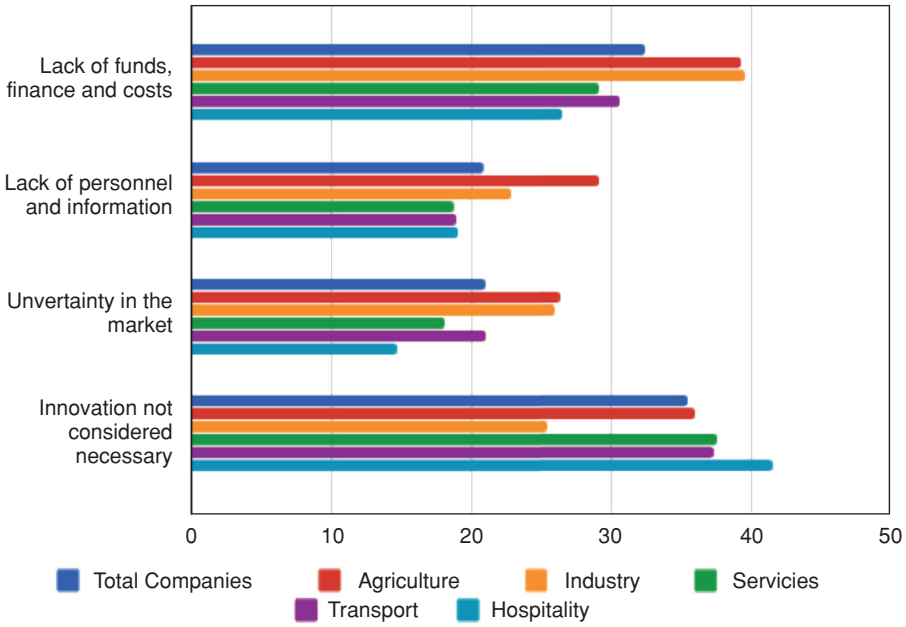
Figure 5. Indicators of innovation in tourism sectors in the Spanish economy



Source: Survey on Innovation in Companies 2016 (INE).

As previously mentioned, in Spain, according to the information provided by the companies themselves, there are many reasons to explain this lack of tourism innovation. Figure 6, also drawn from the Survey on Innovation in Companies, shows some aspects of the Spanish tourism structure dominated by family-run and small businesses that give cause for concern: first, the hotel and restaurant businesses are those that attach least importance to innovation, with more than 40% stating that it is not necessary; another of the main reasons given for the low incidence of innovation in hotel and restaurant businesses (36% of those surveyed) is that there is no demand for new products; followed by the fact that it is too costly (22%), the lack of own funds (17%) and the lack of qualified personnel (15%). In the case of transport companies, the problems reside in the non-existence of new demand (32%), the high costs (23%) and the absence of own funds (20%). This is surprising as it is precisely the accommodation and transport sectors that are most affected by the changes in the marketing of their services undertaken by foreign technological companies.

Figure 6. Reasons why companies do not innovate (% all of the companies)

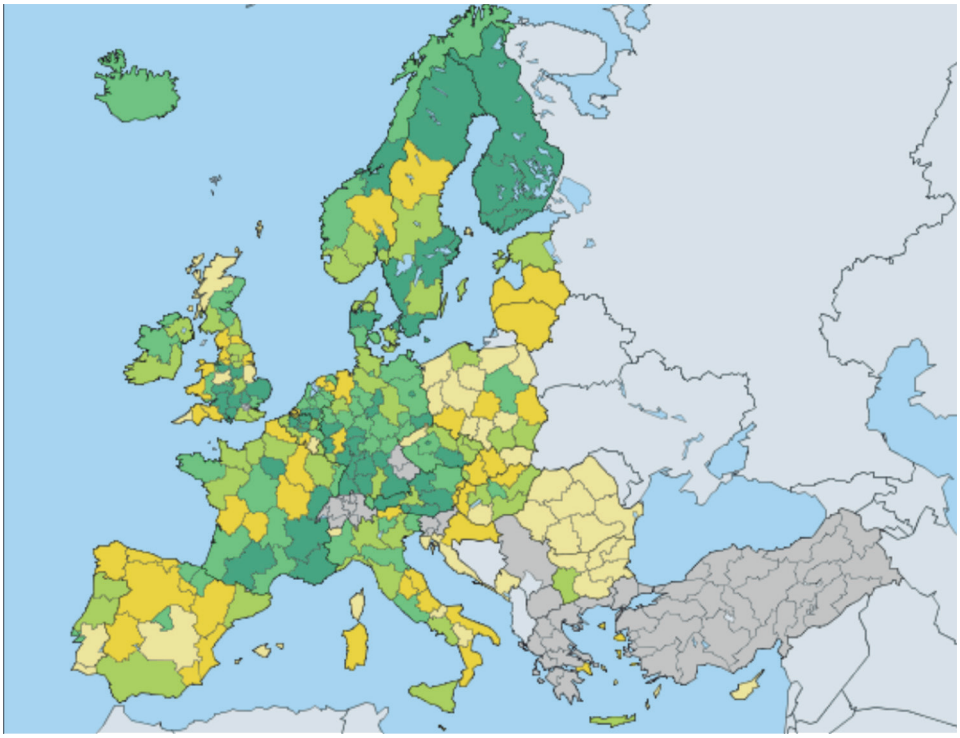


Source: Survey on Innovation in Companies 2016 (INE).

That said, the tourism sector is not an isolated case. The main reason given for not innovating by all Spanish companies (30% of the total) is, according to the firms, as in the case of tourism-related companies, due to an absence of demand and customers who are not very demanding. Although it is true that certain nuances may be made (mainly with respect to the industrial activity of the large companies, whose main difficulty for innovating resides in the lack of funds), it is necessary to point out that the tourism sector suffers from the same structural problems in the lack of innovation as Spain as a whole, although its specific structure aggravates them even more. Figure 7 illustrates this, showing how no Spanish region particularly stands out in the comparative map of innovation in the European Union, as previously pointed out.

The same map also reveals that, with the exception of the Côte Azur, the regions considered as being the most tourism oriented regions in Europe have an innovation deficit. Therefore, it is worth reflecting on the need for product diversification in regions highly specialised in tourism to ensure their sustainability over time in which innovation will be the key to their survival.

Figure 7. Percentage of private investment in R&D with respect to GDP



	% of investment	*Number of regions*
	0.06 to 0.64	56
	1.04 to 1.53	56
	2.36 to 11.36	54

	% of investment	*Number of regions*
	0.64 to 1.04	56
	1.53 to 2.36	56

Source: Eurostat.

4. Generating innovative ecosystems in tourism based on STDs

Precisely due to the highly consolidated state of tourism in Spain, and despite the non-innovative context of the Spanish economy and the early stages of the concept, the «smart tourist destination» has been received with a high level of interest in Spain and other countries (Gretzel, Sigala, Xiang and Koo, 2015). Spain is one of the countries in which the greatest efforts are being made with respect to the conceptualisation, research and development of STDs (Ivars-Baidal, Celdrán-Bernabeu, Mazón and Perles-Ivars, 2017). Institutions such as Segittur are promoting the theo-

retical development of the concept as well as its practical application, investing hope in it to foster the competitiveness and innovation of the national tourism sector and meet the different challenges —including sustainability— faced by Spanish tourist destinations (Ivars-Baidal, Solsona-Monzonís and Giner-Sánchez, 2016; Fernández-Alcantud, López-Morales and Perles-Ribes, 2016; Fernández-Alcantud, López-Morales, Moreno-Izquierdo, Perles-Ribes, Ramón-Rodríguez and Such-Devesa, 2017).

However, for now, efforts are still concentrated on pilot programmes, promoted by the public initiative, although without investment in R&D&I by private companies, it will be impossible to sustain the leadership in tourism competitiveness in the long term. But the innovation required of companies is not casual or isolated. The most innovative companies are, on the whole, immersed in a dense network of relationships that promote, generate and also limit the opportunities for innovating (Dogson, Gann and Salter, 2008, p. 128). These networks, led by the companies, will be necessary to modernise the tourism sector. We are therefore faced with the challenge of stimulating ecosystems on a global scale that combine companies that have tourism know-how with the technological sectors that provide the tools.

These business relationships should not be based solely on the exchange or adaptation of innovation, but on reinventing the tourism industry through hybridisation with future sectors and disruptive technologies, such as big data, artificial intelligence, nanotechnology, personalised education or blockchain. This reinterpretation based on technological avant-garde will contribute a high added value to destination management and the tourist experience, even more so if we consider the business genetics that the Spanish tourism sector has acquired over time. It would also give rise to a regenerating effect of all of the sub-sectors which depend on the tourism industry, helping to modernise their structures, as indicated by Moren and others (2017).

According to the same authors, maintaining the leadership of the international tourism scene requires three key elements: *a)* leading the export of know-how in STDs to Destination Management Organisations (DMOs) in the rest of the world; *b)* fostering an environment that will capture, promote and retain talent and digital entrepreneurialism in tourism (Rae, 2004); and *c)* hybridising the traditional tourism sector to transform it into an avant-garde sector, improving the profitability and external competitiveness of the tourism companies.

All of the previously mentioned elements would form part of the development of smart development, and these tourism innovation ecosystems would be consolidated within them. According to Perles-Ribes, Ramón-Rodríguez, Vera-Rebollo and Ivars-Baidal (2017), many consolidated destinations that are irreversibly confronted by the limits of their growth believe that the solution to their problems of competitiveness and sustainability can be found in the paradigm of these STDs. However, this will require these networks of companies to incorporate new perspectives which, to date, are, to say the least, problematic.

First, the so-called sharing economy should be a strategic element integrated into the structure of the STDs, promoting the efficient and sustainable use of goods and services between peers based on the use of the internet and blockchain. The demand

already understands that these types of services are essential, highlighting the need to regenerate certain tourism services which we believed were consolidated. In fact, the reaction of the Spanish tourism sector to the Airbnb or Uber models shows a worrying failure to adapt to the digital medium. However, we should not forget that both the concept of STDs and the sharing economy define the conversion of traditional destinations into a new concept of destination in which the relationship of the tourist with the environment is transformed. Therefore, they should go hand in hand.

Second, the management of open data will be necessary in the destinations to foster the advance towards big data and the Internet of things. These actions, however, would go against European and national data protection laws. But the Spanish tourism sector must also be disruptive in this field and foster a better interconnection between companies and users and promote new business models based on large volumes of data to which only large multinationals have had access until now.

As a world power in tourism, Spain cannot put up barriers to these types of phenomena if it wants to promote innovative tourism ecosystems. The destinations should learn how to respond effectively and intelligently to the challenge with which they are faced from a legal perspective and to their necessary integration into the digital economy. As indicated by Moreno-Izquierdo, Ramón-Rodríguez and Such-Devesa (2016), all of this alters the dominant organisational models and demand responses in terms of innovation, adaptation, specialisation or regulation.

5. A new challenge of tourism destinations: excess demand or overtourism

As pointed out at the beginning of this paper, measuring tourism competitiveness based on the relative volume of visitors clashes with the idea of sustainability and the fact that a destination receives many tourists is not always a cause for celebration. The massification of tourists without a sustainable management of the destination can lead to negative effects (Vera-Rebollo and Ivars-Baidal, 2011). These diseconomies have been addressed by many authors in recent decades and we can observe the impact from different perspectives, as summarised by Archer, Cooper and Ruhanen (2004): from an economic point of view (increase in prices in response to the pressure of new demand; reconversion of land for tourism services; temporariness of employment), a political point of view (decisions seeking to satisfy tourist companies or visitors and not residents), an environmental point of view (overexploitation of water resources and occupation of natural spaces) and a socio-cultural point of view (loss of cultural identity and problems arising from the cohabitation of residents and tourists).

But, although the problems surrounding the negative impact of tourism have been subject to abundant research for decades, concepts such as overtourism (also excess tourism or tourist saturation) are relatively new, particularly from a scientific research point of view. While studies of sustainability in tourism have traditionally focused on the environmental impacts (territory, fauna, water, landscape, etc.), today the negative effect can also be seen in the residents and their discontent with the loss of qual-

ity of life due to the arrival of an excessive volume of tourists. This tourismphobia is manifested in the classic theory of Doxey (1975) regarding the attitude of the residents towards tourism.

Currently, the growing state of the question (Novy and Comob, 2016; Goodwin, 2017; Milano, 2017; WTTC, 2017 or Pearce, 2018 among others), reveals that several international destinations, measured with similar parameters, are encountering serious problems derived from excessive tourism: Venice, Barcelona, Mallorca, Berlin, Amsterdam, Machu Picchu (Peru), Phi Phi (Thailand), Reykjavik (Iceland) or New York (United States) among many others. So much so that the term Venice syndrome has been coined (Milano, 2017) to refer to the phenomenon of tourist saturation and the exodus of local residents to peripheral urban centres.

Among other reasons, many observe a growing discontent of the residents, particularly due to the emergence of Airbnb and the use of traditionally residential properties for tourism, although there are many other issues that have been unresolved for decades, such as the saturation with a regulated supply of the most attractive tourism spaces, the lack of social housing rent policies, a disrespect for the laws of construction in coastal areas, excessive licences for bars and leisure facilities, the seasonality of the destinations, etc. Therefore, Airbnb is just one more element in a long list.

In short, the combination of competitiveness and tourist attraction, with a non-smart management over the course of many years can lead to problems of saturation and overtourism and, in the long run, dying from success. This problem is becoming increasingly urgent in the most visited destinations, and for those in which the implementation of strategies included in the framework of the STDs could be part of the solution, seeking a higher profitability based on a lower number of tourists, a better distribution of spaces, the geolocalisation of tourist attractions and their affluence, traffic management or promoting strategies to deseasonalise the demand. But achieving these goals requires a combined effort, with the raising of the awareness of the public and private agents and the tourists and residents as the problem of saturation and the loss of competitiveness of the destinations affects all of the actors in the tourism chain.

6. Conclusions

The tourism sector is affected by the constant changes that affect and represent new challenges for the public and private agents and the new competing destinations on an international level, the emergence of digital platforms of tourism marketing or the problems derived from the saturation of tourist destinations. Even such consolidated concepts such as the principles of the sustainability of our destinations are affected by the digital economy and its impact on the sector or by a risk of mismanaging the competitive success of a destination in a globalised environment with falling transport costs. These continuous changes lead us to reflect on the need to advance in the study of tourism competitiveness, given the complexity of this concept.

In the age of globalisation and knowledge, the tourism system is broader and interrelated. Spain, a world power in tourism, and based on a considerable endowment of physical, human and technological capital, has to lead this change in its tourism product based on more R&D&I. Making the most of this opportunity may ensure a sustainable leadership in the long term, which, without question, will entail a new type of relationship between all the agents involved in the tourism sector based on the use of better technologies in keeping with the digital age. This new relational space, which is much more flexible and adaptable, should enable the local society to also substantially gain from the benefits and improve the well-being of its citizens. Becoming a leading agent in the field of tourism knowledge requires it to generate an innovative ecosystem based on the so-called Smart Tourist Destinations. However, their development, to date, has been based on public initiatives and not the real commitment of the Spanish tourism companies. In fact, this is, undoubtedly, one of the main problems of Spain's long-term tourism competitiveness: the tourism companies, which should play a relevant role in the new configuration of the destinations, do not consider innovation in the sector to be necessary, according to the survey on business innovation carried out by the Spanish government.

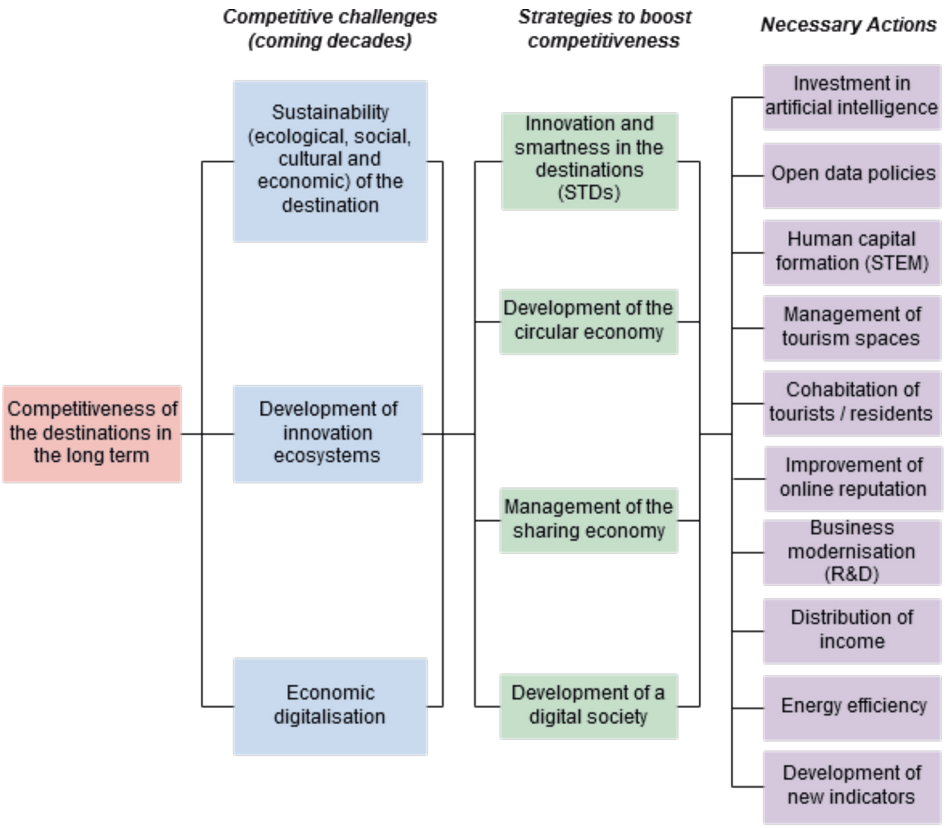
All of this calls for an urgent redressing of the foundations of the competitiveness of the Spanish tourism model in the digital and knowledge age. This is because the rhetoric that reaches the agents of the destinations uses elements such as the incorporation of innovation, strategies related with the knowledge society, the generation of knowledge and talent, or the impacts of the pressure of tourist demand and the cohabitation of tourists and residents, among others. It will therefore be necessary to propose new indicators and measuring systems and to adapt the term «tourism competitiveness» to the current digital age and equip policy makers with tools so that they are able to know when their destinations and attractions require specific actions.

This complex evolution of the tourism activity and its interrelations with the destinations raises relevant uncertainties for the immediate future: Maintaining tourism competitiveness in the long term without tourist intelligence can lead to saturation and overtourism. Does the tourism specialisation in certain products entail a risk of dying from success? Is the sharing economy a determining factor in the saturation of tourist destinations? What role do the technological advances play in this new context and this new challenge?

It is important to take a long-term perspective of competitiveness in which innovation and digital transformation are at the centre of political, social and corporate action in the sector. As we can see in Figure 8 and according to the arguments in this paper, over the next few decades, tourism competitiveness will face a challenge that other sectors have dealt with radically and which will entail a commitment to digitalisation and sustainability on all levels (cultural, economic, ecological...) and the creation of innovation systems that will enable these issues to be addressed. Meeting these challenges will mean the implementation of a series of more specific policies and strategies that will foster Smart Tourist Destinations and the development of a more digitalised and responsible economy based on the collaboration between citi-

zens and tourists. Finally, implementing these strategies will depend on specific actions, such as the commitment to open data, the training of human capital in STEM skills, a management of spaces and rents that fosters the integration of tourism into the normal life of the destinations, a commitment to mobility and clean energy or even the creation of new statistical indicators that help policy makers make the right decisions based on indicators of tourism pressure, the absence of innovation, digital reputation or any other aspect that affects the competitiveness of the destinations.

Figure 8. Framework of long-term competitiveness within the digital economy



Of all of these, as previously mentioned, the controversy surrounding tourism saturation and the response of the residents is particularly concerning as it could lead to competitiveness problems in the short term; followed by the integration of the sharing economy, which could have partly fostered these saturation problems, but which also benefits the development of high-impact sectors, such as hotels or taxis, and finally, the need to consider the real impact of innovation on the more traditional destinations and whether the new tourism destinations are able to converge thanks to factors such as online reputation or the capture of more of the so-called 2.0 tourists.

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Section ARTICLES

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Venice: the problem of overtourism and the impact of cruises

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ABSTRACT: This article aims to present the current tourism problem in Venice and specifically to analyse how the island and the lagoon are being affected by cruise ship tourism. Made a World Heritage Site by UNESCO as recently as 1987, from 2016 it has become a candidate for Heritage in Danger. UNESCO has imposed an ultimatum on the capital of Veneto in order to regulate the flow of tourism and ensure the care of the future of the city. For this purpose, the different socio-cultural factors that have affected the modification of the city will be analyzed, with a primary focus on the tourism sector, such as the relevance of space, the context in a city with such a symbolic past, or the relevance of the market and current economic interests. All these factors have led to one of the most impressive cases of turistification. Amongst all these factors, cruise ship tourism is particularly influential, given Venice's location at the heart of the Mediterranean circuit. Cruises cause a great impact in cities, particularly in Venice due to its uniqueness: pollution, noise, smoke, alteration of heritage and the environment, endangerment of citizenship, architectural and cultural heritage and the environment. And at what cost? With recent changes in mind, and given the extreme situation which has come to pass, it is hoped that public awareness will lead to heavier tourism regulation —in particular for cruises— which would be a key step towards achieving inhabitable, tourist-friendly cities.

JEL Classification: L83; O18; R1.

Keywords: tourism; mass tourism; overtourism; cruise tourism; cruises; Venice.

Venecia: el problema del *overtourism* y el impacto de los cruceros

RESUMEN: Este trabajo pretende plantear el problema actual del turismo en la ciudad Venecia y, de manera más concreta, de cómo afecta el turismo de cruceros en la Venecia insular y en la laguna. El objetivo es poner de manifiesto cómo ha pasado de ser declarada Patrimonio de la Humanidad en 1987 a ser candidata a Patrimonio en Peligro desde 2016. La organización ha dado un ultimátum a la capital del Véneto para que sea capaz de regular el flujo turístico y velar por el cuidado del

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futuro de la ciudad. Para ello se analizarán los diferentes factores socio-culturales que han ido afectando a la modificación de la ciudad, principalmente relacionados con el sector turístico, como la relevancia del espacio y el contexto en una ciudad con tanta carga simbólica o el peso del mercado y los intereses económicos presentes en la actualidad, que han desembocado en uno de los casos de turistificación más impactantes. En toda esta problemática afecta especialmente el turismo de cruceros, siendo una de las ciudades principales dentro del circuito del Mediterráneo. Los cruceros crean un gran impacto en las ciudades y en Venecia en concreto, por su singularidad, con mayor impacto incluso. Contaminación, ruido, humo, alteración del patrimonio y del medio ambiente, puesta en peligro de la ciudadanía, del patrimonio arquitectónico y cultural y del medio ambiente. ¿A qué precio? Con todo este planteamiento, y dada la situación extrema a la que se ha llegado, se pretende llegar a una concienciación ciudadana, en la que una regulación y organización de los flujos turísticos y crucerísticos son claves para hacer que las ciudades sean habitables en un mundo en que el turismo no nos es ajeno.

Clasificación JEL: L83; O18; R1.

Palabras clave: turismo; turismo de masas; turismofobia; turismo de cruceros; cruceros; Venecia.

1. Introduction

Nowadays tourism is a democratised product, the true mark of globalization and of the different advances that both transport and technology have experienced. Sometimes, tourist consumption is so high that regulating it is complex. Due to this massive consumption some terms have emerged, such as «mass tourism» or «tourism-phobia», that affect the most visited cities in the world. Venice is one of these examples and its reduced space essentially forces visitors to be concentrated in the same place (at the same time) and so the actual visiting experience loses quality.

The main objective of the publication is to highlight the tragic transformation that Venice has experienced, from inscription to the UNESCO World Heritage List in 1987 to the List of World Heritage in Danger in 2016. Venice is often referenced as a typical example, albeit on a smaller scale, reflected in a large number of cities worldwide

The article aims to question the cruise tourism and the way that it affects cities and more specifically Venice and to put in value Venice from different angles, analyzing different approaches and actions that have been taken. It aims to put in value the city from its spacial perspective, the historical Venice of Canals and the lagoon, out of the souvenir shops (ignored by many visitors).

To reach this objective it will be necessary first of all the situation of Venice, respect to (mass) tourism and how it affects the city, the context, society, the economy and the market. Secondly, the problem of cruises around the world and specifically in Venice. Finally, considering the different public and private proposals, as well as proposals from the citizenship and the reactions to the measures taken.

After analyzing the impact of tourism in economy and society, we conclude that we need to learn to live with tourism, trying to manage it in the most profitable way to society. Because of that, this article aims to be a compendium of all the causes of the touristic problem around Venice (that can also be applied to other cities), specially the problem of the cruises. We pretend this article to be a reflection and a reason for acting to reach the definitive change in a city that deserves to be protected and conserved, from different points of view: historically, patrimonially, architecturally, socially, anthropologically. Those causes of the problem should help to reach an improvement in regard to tourism management and avoiding «tourismphobia».

2. The current situation of Venice

According to Salvatore Settis, archaeologist and art historian, «cities can die by three different ways: when they're destructed by an enemy, when a new civilization set up by force, expelling the natives and their gods and thirdly, when the inhabitants themselves lose their memory and become foreigners in their own city. If we look around, to our landscapes, to our cities, to be abandoned to beauty is not enough, is not even enough to ask beauty for a miraculous salvation [...]. Beauty will save nothing and no one, if even we are not able to save beauty. Neither culture, History, memory, economy [...] life» (Settis, 2014).

This reflection looks back on the restoration theory that was developed by John Ruskin in «The Seven Lamps of Architecture» (1849). Ruskin will be the first one defending the continued maintenance of an artwork, so that it does not disappear, defending conservation and avoiding restoration at all times. The objective of Ruskin is sustainability. He made eleven trips to Venice between 1835 and 1888 (Fernández, 2018), and thanks to them he wrote «The Stones of Venice» (1851-1853), an allegation against the Venetian contemporary restorations, defending the original artworks and, specially, the gothic ones, predominant in Venice at the moment. In the XIX century, Ruskin appealed for the defence of the buildings conservation and the city identity that today, two centuries later, is still being devastated.

The lagoon has been affected by different factors that have been developed over the years, even going worse. Today tourism is one of the biggest gentrification problems in cities and has become a double-edged weapon, especially when it is not controlled and become mass tourism, like has happened either in Barcelona, Florence, Prague or Venice. The last one is the more affected, because the city has not been able to maintain a balance between the primary needs of the citizen and the demands of the tourists, being the balance more in favour of the latter. Market has suffered a transformation, trying to be at the service of tourism and obviating the needs of the locals, increasingly more reduced, grown old and captive within the «sestieri» or neighbourhoods. Venice is one of the more tourism dependent cities all over the world, just to survive, and it is why it has developed a local economy destined entirely to tourism (Seguí, 2009).

The island is 156.9 km^2, where 30 million tourists arrive each year (Valcárcel, 2018). Venetians do not want to live in their own city anymore and they are moving to the close Mestre. Because of this abandonment, and at this rate, Venice will become a «museum city». A similar situation occurred in 1630. Because of the bubonic plague there was a decrease in the population comparable to the current one (Bernabé, 2016). That makes us think about tourism as a pandemic. In the 1950s, as a result of the economic and demographic crisis in the city and the decadence of the tourist activity linked to the spas of the Lido, Venice started to promote a mass tourism in the city centre. From that moment on, the city has remained in a spiral of economical, residential, demographical crisis Urban crisis is still damaging Venice. It is reflected in exodus to mainland of many of the residents (mainly the youngest), the conquest of the city by tourists and foreign investors, the difficulties of renovation of the hamlet and the physical problems of the historical city centre. Because of all these problems the local and specialized market has lost prominence (Seguí, 2009).

Venice is one of the favourite destinies of the country, with an exponential growth that has overcome the global tourism growth trend. So much that between 1997 and 2010 the number of passengers increased by 440% and the landings of ships increased by 263%, indicating that the growth in tourist demand gradually flows in a growth of the ship size. Respect to cruises, the Stazione Marittima in Venice, is already considered one of the main gateways of tourism (Testa, 2011).

However, the different factors discussed above have caused that the indisputable label of Venice as World Heritage (1987) is put in doubt, faced with the threat of UNESCO to requalify it «in danger» and put it in the «blacklist» of the organization. The way that Venice has become from World Heritage Site to candidate for Heritage in Danger is clear and the factors that have influenced this change are different. Italia Nostra, responsible for the complaint (Menor, 2016), considers that if UNESCO decides to remove Venice from the list and put it into the «blacklist» is just a matter of time, as they did once with Dresdren, after the building of a bridge visible from the baroque city (Settis, 2014).

2.1. Impact of tourism on space

According to Settis, if Venice dies, it Will not happen because of an enemy invasion neither for the irruption of a new civilization (that could be tourism) but it will be because of the forgetfulness of itself. Settis means forgetfulness not the ignorance of the History but the lack of awareness regarding the specific role of the city, its uniqueness and diversity, something present in each city (Settis, 2014).

With this reflection makes responsible all Italians, Venetians (most of them already sensitized and victims of the situation) and authorities, who have the power of decision.

With this reflection Settis reaches the conclusion that cities are not only made of buildings and streets, but also of women and men with different relationships: cul-

tural, religious, social, vital. The urban form is generated and modified over the time according to a powerful mechanism that Henri Lefebvre calls production on space, which means that the space we live in is a social space per se, produced by the human, result of economic processes, politic decisions, cultural elections that modify the balance between public and private, religious and laic, functional and symbolic. Each society produces its own space, a necessary context of the economic activity, social hierarchies, power, knowledge, rites... Space is very relevant and identitary. For this reason Venice has produced along the centuries a cultural and social space, with originality without measure (Settis, 2014).

Social space wraps and determines the body, generates perceptions, an order of values, layers of memory, experiences... Everything in the life of somebody depends on the space is sorrounded by, and very rarely it can be controlled. However, the act of society in the space alters those relations, because of the change of traditions and habits, for example. In the city, in the way it was created, space is loaded with meaning. So, it offers to each one the physical coordinates of its experience, but also the meaning of membership, the collective identity where we reflect. Space in Venice was, and still is, own identity, not just because of the History, but also because of the ambient, with the environment of the lagoon, the life and memory of families, the canals, the cultural, artistic, religious and economical life (Settis, 2014).

Last February 2nd of 2018, the month of the Carnival, the appearance of Venice was unusual. We even did not find the famous «acqua alta», the scene was upset. On this occasion, an unusual low tide giving an image of empty Canals and gondolas stranded in the mud. Is not the first time that something like that happens in Venice. The city has suffered significant drops in water levels before. This year it has dropped 60 centimetres, in 2016 the water level dropped 66 centimetres, in 2008 and in 1989 it dropped 90 centimetres (La Vanguardia, 2018). The historical record of low tide occured in 1934, with less 121 centimetres (La Nación). It could be because of the astronomical phenomenon of the blood blue super moon, which came out on the same week of February. But, on the other hand, another cause of this problem, of this alteration of its context and its reality, is due to tourism (and cruise tourism), because when the city put the interest in citizens, Canals were cleaned up of excess mud and were navigable most of the time (La Vanguardia, 2018).

Jacopo De' Barbari designed in 1500 in his famous Venice map the framework of secrets under the canals and the division in six neighbourhoods or «sestieri» that represent the six «ferro» teeth, the iron of the bow that decorates gondolas. But Venice is not just beauty, is the syncretism between East and West itself, is Marco Polo, is market, music, l'Arsenale and the ships, the salvation of the classics. Venice is Petrarca, the Biblioteca Marciana, Aldo Manuzio printing. It is also Lepanto, Palladio's architecture, the paintings of Carpaccio, Gentile Bellini, Tiziano, Tintoretto, «La Scuola Grande di San Rocco»... (Valcárcel, 2018)· St Mark's horses, the «campanille» and the «com'era e dov'era» by Luca Beltrami.

It is so important the identity of Venice that from itself also emerges a very important concept in restoration, the «com'era e dov'era» by Luca Beltrami. On July 14,

1902, the «campanille» of St Mark collapsed, remaining the city without bell tower (again for not paying attention to the needs of the city). With the need for lifting a new tower, the purposes done are many and diverse, but at the end the chosen one is that made by Luca Beltrami, heir to the theories of John Ruskin and William Morris, because the sense of identity and membership were essential in Venice, and they are still important. On this occasion the idea is not to change the original view of the most representative square in the city. So Beltrami built the bell tower «com'era e dov'era», as it was and where it was. With Beltrami the current of the historical restoration starts.

2.2. Relation between tourism and market

Protected by its lagoon, in a millenary symbiosis, this city seems to be immune to any attack and unable to grow old: a happy island. But it is not really like this. The happiness that each traveller feels once arrived to Venice, instantly catched by the urban (and human) dimension and also the feeling of total immersion in a natural environment, soon gives way to other thoughts. It is enough to stay for a few hours in Venice to feel the dark ghosts of a «modernity» without future. Cruises burst the quiet walk, like enormous skyscrapers, creating a huge impact in the space of the city. Cruises never stop remembering us in each meeting that Venice is not eternally young and wonderfully complete in itself (like it seems to be), but nevertheless is old, dying, poor and it needs to begging from tourists. At all cost (Settis, 2014).

The Venice urban form seems to contradict the idea of «modernity» related to skyscrapers, because of the fact that it has no one and no traffic, apparently is an idyllic island. However cruises arrive at the heart of Venice, taking the shape of a «skyscraper-ship» humiliating the city and the Venetians, becoming an ephemeral and arrogant form of the skyscrapers. According to Settis, it happens just because impact of damage cannot be measured (Settis, 2014). It rather happens because Venice is sold to the consequences of the damages.

If Venice dies it won't die just Venice, but also the own idea of modern city, the city as a space where to develop the social life and to create culture. Venice is the largest icon of the western city preserved and, for that reason, is the biggest goal of the new barbarians, which want to put it to the «God market» service. Offending Venice is not an unwanted consequence, but the intention of the project itself. Desecration, moreover, the visibility of desecration has a symbolic meaning, it is a vulgar statement of «hypermodernity», that wants a past revenge, to humiliate Venice looking at it from the top of one of the big cruises either a rooftop in Rialto, or a skyscraper in Marghera, as if they were visiting the thematic park «Italia in miniatura» in Rimini (Settis, 2014). Venice does not need anything of this to be admired. It just needs services. It has been invested only in the tourism industry. If that policy had been followed Venice would only need to be preserved, because the good tourist admires it on its own.

To save Venice from the repeated commercial offers that can drive it to death, it is not enough to reactivate our memory or aesthetic taste, and not even to be conscious

of the problem. The key is to know how to do something relevant, trying to go further, creating social awareness, elaborating a project for the future that preserves the unity of the city and the care of the context and the environment. For this reason, Venice became a national and international fireproof, an experiment to analyze the accelerated degradation of city centres (Settis, 2014).

Market in Venice has entered into a phase of very pronounced specialization that leads the city to a musealization, like a tourist product itself. Venice has created a tourism dependant relationship, because the city does not conceive its survival without it. Venice has obviated the first need products and prevail the touristic sector, so that they need to demand tourists constantly, otherwise tourism makes life in Venice untenable. In a city with many conservation problems and with such a high maintenance cost, those who can afford to live in it are very few. The problem started with the investor's arrivals who are not involved in the management of the commercial space or the hamlet, where the city has being adapted to visitor's needs and demand, putting little resistance to a commercial and touristic model that does not benefit the city and that tests constantly its tourism carrying capacity. The city centre has been occupied by locals intended exclusively for tourists, such as souvenir shops, Venetian and regional craft (mainly masks and Murano glass objects) and, in this century, international luxury brands (Seguí, 2009). According to Seguí, the public agents declared that «the luxury shops seek to associate the beauty of the city with the beauty of their products, although the main controversy is that services have been closed to residents to open businesses oriented to tourism».

Luxury market includes a lot of products, such as leisure, tourism and culture services, that generate in the consumer a unique experience away from mass consumption. Taking into account the situation of Venice, some people think that luxury tourism is the solution of the problem, limiting the number of travellers and increasing the money income per tourist. That is why a maximum capacity was applied during the Carnival or control barriers were placed during the long weekend of May 2018 (Seguí, 2009). The idea of controlling the capacity in the Carnival came out to not overcrowd St Mark's Square. So to be able to attend the events it was a must to arrive in advance, while if you did not succeed more than 200 activities were offered. In 2017, 100,000 people came to «Il Volo dell'Angelo», so the need for controlling the capacity was clear, just for security reasons (Nuova Venezia, 2018, Contapersona, il Carnevale di Venezia sarà a numero chiuso). At the end, after considering different options, it was decided to fix a maximum capacity of 11,000 people in each show, as a measure of control of tourist flows, while resident's access was guaranteed. On the other hand, in St Mark's Square, the maximum capacity was 20,000 people, while the «voli dell'Angello e del Aquila», was the fifth of the capacity of previous years (Nuova Venezia, 2018, Carnevale di Venezia al via con il numero chiuso: steward ai varchi d'accesso). The installation of the four turnstiles in April 28, 2018, tried to regulate the capacity during the longweek of May and control the pedestrian and aquatic traffic. It was expected to be an action well accepted by Venetians. However, lot of venetians have reacted against this installation, because they felt even more in a kind of «Veniceland». Venetians think that «what it is necessary are houses, no check

points» so the same day as they were installed, one of the turnstiles was ripped (Repubblica, 2018, Tornelli per turisti a Venezia, ripristinato il varco rimosso dai centri social). The mayor testifies that he feels proud of the initiative because he considers that is the first action that has been taken, although the reception was expected to be more positive. However, the Council will try to take other measurements to regulate the flow of tourism (Verdú, 2018). The capacity has not been exceeded and the turnstiles were opened, even if the protests have continued throughout the month of June (Repubblica, 2018, Venezia, nuovo blitz dei centri sociali contro i tornelli: «Benvenuti a Veniceland»).

Lux market can be considered as a tool to renew and get better the commercial image of a city, but always with a local commitment. When it does not happen, a functional area can be gentrified and dedicated it to restricted users, causing an increase in the price of land, the expulsion of small local and regional commerce and the creation of a commercial duality. In small cities, as Venice, the differences between both types of commerce are much more visible and accused, so it is necessary to integrate the business establishments within the commercial planning policies that are to be carried out (Seguí, 2009).

In view of the above, different conclusions can be drawn: first at all the impact of tourism in society, economy and politics and the need to control it; secondly, the rejection reaction that arises from society to tourism; and finally, that Venice suffers a problem of special attention for different reasons, which should have already been solved.

3. The plague of cruise tourism in Venice

3.1. The World cruise activity

The World Tourism Organization defines cruises from the conception of the ship as a floating resort and not as a mere means of transport, where recreational activities alternate both in the ship and in onshore. Therefore, cruise industry is different from other ways of travelling because it can be marketed like a transport or like a destiny, and you can enjoy one or both parts of the trip (Luna Buades, 2005). It is known as a tourist resort because it incorporates all kinds of facilities of a resort (Butler, 2008).

From the creation of the cruise service, the demand has been growing at an accelerated rate (one of the biggest growths in the last 30 years, close to the +8% cumulative annual), reflected in the touristic ranking, taking the main cruise companies the first positions. Cruises have boosted marine transport, exceeding 21 million passengers in 2014. It is a delocalized and global business with a huge impact because of its quick settlement. It highlights the success and economics strength, reducing costs to offer a low-cost service (Butler, 2008).

Calculating the economic impact of a destination is relevant since it allows objectively to assess whether cruise tourism is economically beneficial or not for the

local community. For this, must be considered the available infrastructures, level of development and accessibility of the destination, as well as the economic agents that intervene and an analysis of socioeconomic and environmental sustainability. The concept of cruise as marine resort implies greater interest of shipping companies in increasing the time of passengers on board, decreasing their stay at the destination and, therefore, reducing the local consumption. Furthermore, on some occasions, there is some competition between destinations and shipping companies, because the ship is a destination itself, generating almost no impact on the local economy. There is no doubt that tourism entails a transfer of income to the destination, although it is also true that a good part of the profits obtained reverts back to the tourism multinationals of developed countries, mainly hotel chains, tour operators and airlines or shipping companies. Part of this problem is because of the low participation of local agents and the limited regulation and taxation (Butler, 2008).

3.2. «No alle grandi navi»: the cruise problem in Venice

One of the main entry routes for tourists is the arrival of large cruises, one of the biggest current enemies of the city, because they generate a huge impact on the environment, they damage its basic constructive structure and the ecosystem and do not generate a prolonged wealth in the city. Venice receives 66,000 tourists a day. Of all these people, two and a half million tourists arrive on cruise each year (Valcárcel, 2018). In 2009, the number of passengers that have disembarked in Venice from cruises have been 1,420,490 and in 2010 1,598,616, with an increase of 12%. The crossing of the cruises by Bacino San Marco was of 1258 in 2010. Cruise passengers suppose a high number of visitors per year, who crowd in the same space during a specific time slot, turning the city into the kitsch card of itself (Testa, 2011).

Settis considers that the removal of cruisers from the city is not ordered because the damage cannot be accurately measured. What the authorities hide behind is in benefits. President of Venezia Terminal Passeggeri (vtp), Sandro Trevisanato, affirms that ships enrich the whole city and that the port guarantees direct products (230 million spent in the city by passengers) and indirect products (the complex of the economic activity triggered by cruise activity) of almost 500 million euros a year (Balance de previsión aprobado el 27 de septiembre de 2010) (*www.vtp.it*). It is estimated that the average daily expenditure of tourists in Venice is 120 to 160 €, which means 250,000,000 € a year (Valcárcel, 2018). Even so, a local impact cannot be demonstrated in all cases. Ministers, mayors and port authorities cannot be unaware of so much destruction, but they tolerate it (moreover, they encourage and promote it) in the name of a single value: money. A million and a half tourists a year, after having a distracted look at Venice, wander or buy something in the stalls, and most of the time the biggest impact is that they just pay an access fee (Settis, 2014).

The environmental factor is also added, if aesthetic or economy factors are not enough to put a stop to cruises. How much it costs to hurt Venice? Cruises are harmful and dangerous to the city and its inhabitants, despite the port authorities say the

opposite (Testa, 2011). Cruises represent a threat to the environment and it is essential that they respect the environment to preserve the local ecosystem (Luna Buades, 2005). To the horrible visual impact are added an increase in the turbidity of the water and the risk of collisions and spills of hydrocarbons in the heart of the city.

No one in the Ministry of the Environment or Palazzo Chigi has calculated the effects of displacement, the pressure of thousands of tons of water on the fragile coasts of Venice. Nobody has offered data on fine dust pollution (500 tons unloaded from ships in Venice in 2010); or the presence of highly toxic benzopyrene in the lagoon. No one offers data on radar contamination or on the release of poisons from antifouling paints (Testa, 2011). No one can say if the tumour diseases that could have these causes are increasing in recent years, even if the tumours registry indicates for Venice a «significant excess of pulmonary neoplasia» (Settis, 2014). Emissions produced by cruises are comparable to those of hundreds of thousands, even millions of cars. So, unfortunately, a city without traffic is now exposed to noise and pollution of cruises («Grandi navi a Venezia: tra turismo e tutela della Laguna, giusto lasciarle fuori?», 2017).

More than 12 cruises are often found in Venice at the same time and the Marittima docks are insufficient to park at night. Because of that, ships use to park to in Riva dei Sette Martiri, very close to houses, with engines running day and night, which means vibrations, smoke, noise, electromagnetic pollution by non-stop radars, etc. A 2004 agreement pretends that this situation in Riva dei Sette Martiri does not take place more than 7 times a year; however, this agreement is violated much more frequently (Settis, 2014).

Cruises problem affects in a global way because it supposes a great (mass) tourist impact instantly, a space impact and with little monetary repercussion (whichwould not justify it either). Locally there are few benefits, even if the cruise passenger benefits from the experience of visiting the city just for a few hours. Lot of cities suffer the spatial impact, altering their context and their routine. In Venice, where space is even more limited, the presence of these great ships (and tourists) is inmediately noticed.

Salvatore Settis wonders: why, if we want to bring tourists to Venice by sea, does it have to be with super-polluting ships that glide through the city like they were skyscrapers? The excuse is always the same: without the cruises there would be no tourists (Settis, 2014). It is remarkable how a high percentage of citizens see a positive contribution and employment creation; on the other hand, others see the collateral damage created in the environment by the cruises in the lagoon, at the bottom of the canals, in the environment... («Grandi navi a Venezia: tra turismo e tutela della Laguna, giusto lasciarle fuori?», 2017).

«And they call them ships». That is the name of the publication of Silvio Testa, Venetian journalist that has followed closely, during the last 40 years, the main events of his city. Actually they should be ships, but are not very similar to the great ships that are remembered from History (Testa, 2011). Testa defines these giants like temples of consumerism, a «super-cruises» that shamelessly conquer the capital of Veneto, destroying its horizon (and its sunsets). They look more like one of the Las

Vegas hotels than a ship. As in Las Vegas, here we can find ships with thousands of rooms of «exclusive» luxury. And they transmit the illusion of apparent luxury, but keeping costs low: here the unskilled staff, the disasters such as Isola del Giglio with Costa Concordia on January 13, 2012. Many platforms testify the fear of a catastrophe in the city centre.

These ships look more and more to cities, they are the reincarnation of skyscrapers. However, there is nothing naturalness. Actually, their moment of glory is when they break in Bacino San Marco, showing their arrogance, challenging millenary basilica, the bronze horses, the Palazzo Ducale (Settis, 2014). Fortunately, it is not happening now, after the action taken by UNESCO in January 2018 to ships of more than 55,000 tons. The solution is to cross Malamocco and to dock in the port of Marghera, in Mestre and tourists being transferred to the city by bus (Cadena Ser, 2017).

These cruises are like floating cities, 60 meters high, even more, higher that the «palazzi» of the Grand Canal. Actually, the average height of the buildings in Venice does not exceed 15 meters (Testa, 2011). For example, the Voyager of the seas is 63 meters high, 311 long and 47 wide. Because of that any visual perception is upset. Cruises come into the heart of Venice to appreciate its beauty. However they damage it and disturb the perception of the city (aesthetically and culturally), its context, its environment, to people in their home or the street, creating a shadowy effect like seeing an eclipse (Settis, 2014). Cruise tourism is selfish and vague commitment.

The conclusion of this chapter is that cruise tourism is one of the touristic offers with higher impact on space, society and environment. It is one of the more difficult ways to control tourism flow. Moreover, it highlights the case of Venice, where economic interests prevail over the other ones.

4. Responses to cruise tourism in Venice

4.1. Measures against irresponsible tourism plans

Once all the studies and problems caused by cruises as a touristic option and in Venice in particular have been raised, proposals are different to keep them out of the city. Nowadays, there is no consensus, so the decision has been taken to divert cruises weighing more than 40,000 tons, preventing them from passing through Bacino. At least this measure is already recognizing the risk («Grandi navi a Venezia: tra turismo e tutela della Laguna, giusto lasciarle fuori?», 2017).

Who want to abuse the lagoon always remember that it is artificial, which is true, but it has been for thousands of years, while its balance it has been only broken less than two hundred years ago, to allow the development of a modern port. In 1901 the average depth of the mouths of the port was 7.5 meters in Lido, 9.5 meters in Malamocco and 4 meters in Chioggia. Today, to allow the passage of cruises (increasingly large) the depth has reached 12 meters in Lido, 17 meters in Malamocco and 9 meters in Chioggia (Testa, 2011).

Proposals are very varied: to build a floating port in the entrance to the port, outside the island of MoSe (Modulo Sperimentale Elettromeccanico), therefore at the sea; to build a fix port co-located; or, as Italia Nostra proposes, that ships go to other cities such as Trieste or Ancona... The interests are strong, also in Europe, but the Italian State has the power to prohibit the definitive entrance to the ships («Grandi navi a Venezia: tra turismo e tutela della Laguna, giusto lasciarle fuori?», 2017).

It is remarkable that the MoSe, the project of mobile dams in the entrances of the port, does not serve to protect Venice from «acqua alta», as the rest of the world is led to believe. However, its function is to maintain an incompatible port in the lagoon. With a port with some functions in line with the place, it could return to a more balanced lagoon and the «acqua alta» would have lower levels and frequencies (Testa, 2011). This argument has been a taboo, as a port outside the lagoon would have made useless the MoSe.

With regard to the open sea port, it can be taken into account for cruises, trying to solve in a sustainable manner the way of taking passengers to Venice. In any case, the number of cruises should be reduced, because they can not only depend on the exponential growth imposed by world trends and port, economic and tourism interests. Moreover, this kind of tourism must be regulated, because is not respectful (Testa, 2011).

4.2. Private initiatives

The article focuses mainly on private initiatives, because public support is limited. Due to the gentrification process that the city has suffered, many movements (physical and virtual) have been organized in and around Venice, to defend it from all the points in which it is affected and attacked by this new epidemic.

Many platforms have been created, because there are many venetians who are against cruises and are joining forces. In Facebook, for example, you can find the group «Fuori le maxinavi dal Bacino di San Marco» (Fuori le maxinavi del bacino di San Marco, 2018). There are posted news, pictures, videos about the city, events appointments, relevant information...

The organization «Comitato No grandi navi – Laguna Bene Comune» organizes a movement that seeks the expulsion of the cruises from the Bacino di San Marco (today those exceeding 40,000 tons), defending the symbiosis between Venice and the lagoon. The organization organized a self-managed referendum on June 18, 2017. In this referendum population should answer the following question: «Do you want the cruises to be out of the Venetian lagoon and that no new excavations are made in the lagoon?» Results were unexpected for the organization, with a participation of 18,105 people, 80% of them venetians, the rest foreign. 17,874 people, that is a 98.72%, voted affirmatively. Undoubtedly, the referendum will be decisive to advance with the problema (Pietrobelli, 2017).

Thanks to the project Venexodus, hundreds of venetians have protested (picture 14) against what is probably the most alarming depopulation in the world, caused by high rents, the shortage of housing supply and growing tourist industry. Citizens demand a limit on the flow of tourism and more affordable housing (to prevent the population diminishing further). Population in Venice has decreased to 55,000, since around 175,000 in 1951, with a decrease of 66% (La Nuova di Venezia e Mestre, 2017). Around a thousand residents leave the city each year. Meanwhile, the number of visitors has experienced a massive increase in the last 25 years, benefiting hotels and local operators, as well as those who rent apartments to tourists. It is difficult to try to find a balance in a city where tourism gives life to it while taking it away, at the same time. «Tourism made us rich in a short term, but it is killing us in a long term», said Matteo Secchi, from the Secchi community group. «We are turning into Pompeii, a place where people come to visit and says is fantastic, but nobody lives in there». Our of the thirty million tourists that Venice receives, only 25% overnight (Valcárcel, 2018).

There are other initiatives to deal with the matter from another focus, as «Venecia (NO) está en venta», the curatorial project by Anita Ozores and Valentina Negro selected for the sevillian contemporary artfair S.A.CO. Different contemporary problems of Venice are highlighted through different artistic projects. The Venetian life and the impact of cruises in it versus the touristic city are shown through photography and videoart. Venetians have participated in some of the projects, as Vogliamo Venezia, who organized a Flash mob in front of Palazzo Ducale with photographies of cruises after rejecting the exhibition of the artist Gardin, who works on this subject [S.A.CO 2016: Venecia (NO) está en venta, entrevista a Anita Ozores y Valentina Negri, 2016].

It is very useful to make a search in social network with the hashtag #NoGrandiNavi. Users even public pictures of other cities like Genoa. Thanks to this hashtag we can analyze the involvement of the population with the cruises conflict, their presence in demonstrations and what they demand.

On the occasion of the celebration of the LGTBIQ Pride, Facebook launched a campaign in June 2015, in which users could add an automatic filter with the multicolour flag, in defence of sexual rights (20 Minutos, 2015, Facebook crea un filtro arcoíris para que sus usuarios celebren el orgullo gay en su foto de perfil). The next option that Facebook brought was to allow to place the French flag on the occasion of the Parisian attacks, some months later, in November 2015 (20 Minutos, 2015, Facebook habilita la opción de poner la bandera francesa en la foto de perfil). The social network has added different frameworks. Since 2017 one can be added against all that is involved in cruise tourism, thanks to the collaboration of the Facebook group «Fuori le maxinavi del Bacino di San Marco».

After all the issues raised in this chapter, it can be concluded that there is a certain level of awareness, reflected in the different efforts of action. However they have not been enough to provide a solution to the trinomial Venice-tourism-cruises. It is a must that Venice tries to reach a balance between its immediate economic

needs, protected by tourism, and to ensure its role as a city and to be able to perpetuate itself.

5. Conclusions

Once the whole article has been examined, different conclusions can be drawn, from the analysis of tourism and cruises tourism in general and particularly in Venice. After analyzing the current situation of tourism, it is remarkable the impact that it makes economically, socially and contextually, so the negative social reaction to in many cases. Tourism democratization has led to a disproportionate use of it, not in excess but with a bad management, even if an increasing consumption was foreseen. The problem in Venice is even more remarkable for its particularities. Figures are overwhelming. A city of 156.9 km^2 receives 30 million tourists per year. Tourists do not stop coming, motivated by cruises too (in 2017 2.5 millions of people landed). Population has descended two-thirds since the last century, becoming one of the most notable case of gentrification and touristification. The problem in the island has been that the market of tourism has been imposed on the needs of citizens, and now tourism has an effect on space day by day. All this has ended in «tourism-phobia». Many travellers visit Venice, admiring it, and getting lost in its corners, going beyond St Marks, the Bridge of Sighs or Rialto. Tourism is a power in Venice, but Venetian people must take care of it, taking actions to not to squeeze the city (like getting out the cruises of the Bacino). Venetians (and Italians) should ask for a cultural focus, with visitors able to appreciate its value and history. All this is a long-term problem and without being solved yet, which still requires strict control measures. Cruise tourism makes a negative impact and that is why citizens of different cities are mobilising. If actions are not taken, people will reject tourism, generating new cases of «tourism-phobia».

After analyzing all the problems caused by cruises tourism, in any of our cities and particularly in Venice, it can be concluded that is necessary to control the entrance of cruises to the heart of the city. Each city, from its identity, capabilities and qualities, should be able to offer a rich tourist offer. Personally, I consider cruises incompatible with this option, maybe the cruises on the high seas, but not tourists in mainland, who are unable to enter the city (regardless of what their interests are). Even though, cruises as means of transport produce a huge environmental impact that has to start to be disregard, considering the wide touristic offer that we can find on Internet and in touristic agencies. Cruise tourism is one of the tourism offers that cause the biggest impact in space, society and environment. And controlling tourism flow through cruises is very difficult. Moreover, it is remarkable the economic interests, that prevail over the other one. This is a typical management problem that must be improved following smart tourism destination tools.

Venice has fought against different problems along its history, trying to preserve its values to remain the unique city which is today. July 14, 1902 the Bell Tower collapsed, for not taking due measures in advance. With Beltrami starts the

current of the historical restoration, a response inspired in John Ruskin and in William Morris. The campanile was reconstructed «com'era e dov'era» (like it was and where it was), a concept that will be known internationally. From that moment the bell tower of St Mark honours the conservation of the spatial concept and the context. Every time that a cruise comes into the lagoon and breaks the context, taints the name of Ruskin, Morris and Beltrami, their publications, the «com'era e dov'era» and the later restoration letter and current restoration documents influenced by all of them.

We admire Venice and its lagoon because of its ability to adapt (now missing), for its struggle, against invasions, against epidemics, tides, humidity, but not against itself. Venice has too many problems to be damaged by extra pollution, with excesses of tides, with giants that break its context, a context that anyone admires just for the fact of being Venice. Because when Venice plays not to be itself, the city loses. And now the countdown has started.

Venice is digging its own tomb, being aware of it. Because of its particularities, Venice needs a special action (didn't take). It is why the state of the city has been worst that others. However, it is expected to be a global example to not allow a touristic management problem become a social problem with an unpopulated city. To prevent that is necessary to consider the touristic behaviours, the consequence of all the problems and the action of the State, and to be focus in a quality and respectful tourism.

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Section ARTICLES

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Public support for entrepreneurship, human capital and talent in the context of Spanish tourism

Saúl Cobo-Soler *, Andrés Fernández-Alcantud **, José María López-Morales ***, Marta Santamaría-García ****

ABSTRACT: The key challenges the Spanish tourism industry faces in the coming years are related to the necessity to promote and develop tourism activities based on entrepreneurship and its associated competitive advantages. This article submits a detailed and up-to-date overview of the contributory effects of governmental and public initiatives on entrepreneurship, human capital and talent in the tourism sector. This work also provides a regional analysis concerning entrepreneurial-tourism related public policies in Spain.

JEL Classification: L83; L26; H57; O38.

Keywords: tourism; tourism policies; competitivity; entrepreneurs; human capital.

El apoyo público al emprendimiento, al capital humano y al talento en el ámbito turístico en España

RESUMEN: Los principales retos a los que se enfrenta el sector turístico español en los próximos años pasan por la necesidad de fomentar las actividades turísticas basadas en las ventajas competitivas asociadas con el emprendimiento. En este artículo se ofrece una visión detallada sobre la contribución que ha tenido hasta la fecha la administración pública en España en el fomento del emprendimiento, del capital humano y del talento en el ámbito turístico. En el trabajo también se analizarán las principales repercusiones a nivel regional de las políticas de apoyo público al emprendimiento turístico español.

Clasificación JEL: L83; L26; H57; O38.

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1. Introduction

During the last decades, tourism has become one of the most important economic activities for the Spanish economy, with a notable presence in terms of economic growth (measured in terms of GDP), employment and balance of payments. During the most recent years, the number of tourists and the revenue generated through non-resident tourists' expenditure have been growing uninterrupted, reaching record levels in 2017: 81 million tourists and close to 87,000 million euros of revenue [National Institute of Statistics (INE), Frontur and Egatur Statistics].

There is, therefore, no doubt that the Spanish tourist sector finds itself in a crucial moment which is reflected and enhanced by the fact that Spain leads the international ranking of tourism competitiveness. Nevertheless, in order to maintain this privileged and beneficial situation of the national tourism industry, it is essential that in the short- to mid-term both the Spanish public and private sectors are capable of confronting and ceasing the upcoming challenges and opportunities of the tourism sector. These challenges and opportunities are, for example, the forecasted gradual reduction in economic growth of the main European countries that compose the largest share of tourists in Spain; the increased political stability of other Mediterranean countries, who are direct competition of the Spanish tourism; the promotion of sustainable tourism which can enhance other tourism models (MICE, cultural or sporting tourism) that are different to the traditional national tourism model of beach and sun; or the expansion of the so-called collaborative economy tourism model, which is linked to the development of new technologies.

There is a wide agreement that in order to successfully tackle all these challenges, it is essential to prioritise the promotion of tourism activities based on the competitive advantages associated with entrepreneurship, human capital and talent (Aldebert, Dang and Longhi, 2011; Brookes and Altinay, 2015; Hall and Williams, 2008; Hallin and Marnburg, 2007; Hjalager, 2010; Li, 2008; Page and Ateljevic, 2009; Russell and Faulkner, 2004; Shaw and Williams, 2009; Xiao and Smith, 2007). The role that the public administrations are going to play in the promotion of these aspects is vital for Spain to maintain its position as an international tourism leader. For this reason, the principal objective of this article is to present a detailed overview of the contributory effects of past governmental and public efforts in the promotion of entrepreneurship, human capital and talent in the tourism industry. This work also provides a regional impact analysis of the results of the different public policies regarding Spanish entrepreneurial tourism.

The article is structured in the following manner. Firstly, after this introduction, the second section provides a general overview of the role that entrepreneurship, human capital and talent play in the tourism industry. This section also contains a description of Spain's basic tourism policy characteristics, as well as the support it

provides for talent and entrepreneurs in the tourism industry. The third section of the article explores the main actions and efforts undertaken by public administrations to promote entrepreneurship and human capital in the tourism sector. It firstly describes the initiatives undertaken by the public sector that promote and support entrepreneurship in general. It then moves onto public programmes which are strictly concerning entrepreneurship in the tourism industry. The fourth section analyses the regional implications of the various policies that support and promote entrepreneurship in Spanish tourism. Amongst all the policies, the programme EMPRENDETUR, launched by the Spanish State Secretariat for Tourism (Secretaría de Estado de Turismo del Gobierno de España) is particularly important due to the high levels of financing and funding it has supplied to the sector. The article shall conclude with the fifth and last section, which presents a summary including the authors' final conclusions.

2. Entrepreneurship, human capital and talent in the tourism industry

2.1. Tourism, competitiveness and innovation in Spain: a general overview

Spain is currently amongst the global leaders of the tourism industry in terms of both number of inbound tourists and tourism expenditure (Fernández Alcantud, López Morales and Perles Ribes, 2016). In addition, it also ranks first in the Travel and Tourism Competitiveness Index, which is produced bi-annually by the World Economic Forum (2017). Spain's international leadership in the tourism industry is primarily due to its capacity to supply a very professional and high quality service, to the existence of a wide array of cultural resources, to the highly developed and abundant network of tourism infrastructure, and to its ability to adapt its tourism supply to the current digital consumption trends and habits. All of these positive tourism aspects are the fruit of Spanish «know how» in the tourism sector and to its ability to adapt to the requirements of the demand. Spanish «know how» and adaptation skills have been enhanced and facilitated by the public sector support in integrating entrepreneurship, human capital, talent attraction and retention in the tourism sector.

Ever since the founding of the Spanish State Secretariat for Tourism in 1905, the government has actively focused on developing the business and entrepreneurial environment that surrounds the Spanish tourism industry. All governments after to 1905 have consistently been committed to the national tourism industry. Over more than a century there have been several public institutions and departments dedicated to the management of tourism, whose responsibilities and objectives have evolved in line with the socioeconomic context at each point in time. The tourism industry is very important for the Spanish economy and is characterised by a series of peculiarities which have led the Spanish tourism sector to become highly dependent of the international context as well as, of course, the national situation.

The national tourism industry has been a key component and factor of the Spanish economic development and growth in the last six decades, becoming one of the most productive industries in the Spanish economy (Cuadrado-Roura and López Morales, 2011 and 2015). The high levels of economic contribution the tourism industry can be explained by the industry's high labour intensity, its capacity to generate a dynamic job creation environment, and by its transversal and systemic nature, since it has the ability to create indirect positive spill-over effects across several other industries. These characteristics of the Spanish tourism sector, job creation and positive spill-over effects, are the basic factors required to implement successful tourism policies (Fernández Alcantud, López Morales and Such Devesa, 2017).

With regards to job creation, according to recent statistics of the National Economically Active Population Survey (EPA, Encuesta Nacional de Población Activa) produced by the National Institute of Statistics (INE), in 2018 the 13% of Spanish active labour force is employed in the tourism industry, which amounts to a total of 2.5 million people. In some regions the tourism industry accounts for over 30% of the labour force, as is the case with the Canary and Balearic Islands. It is important, however, to explore whether Spain's capacity to create employment is accompanied by an equivalent generation and development of human capital. Employing the available data, it has been observed that the academic formation of those individuals employed in the tourism industry is inferior to that of the labour force in the services industry, and also in comparison with the national average. In 2013, for every ten individuals employed in the tourism industry, approximately, six would have attained secondary education, three would have attended college or college and university, and only one individual would possess primary education as his/her highest level of education or no education at all. In other words, there is a lot of room for educational improvement in the tourism sector's labour force, which is vital for Spain's tourism to transition from a labour intensive industry to a human capital intensive industry.

In terms of the positive spill-over, or knock-on, effects that the tourism sector provides the Spanish economy, which is the best way to assess its contribution to Spain's GDP, we can distinguish between direct effects on the tourism industry itself, and the indirect effects it has on the rest on Spain's economic activities. The main direct positive impacts it has in the tourism sector itself are: the outcomes of the foreign exchange, the creation of employment and the economic activity it stimulates in the multiple businesses this heterogeneous sector presents. In addition to the tourism industry's capacity to inject money into the economy via the increased economic activity and income generation from tourists' expenditures, the indirect or induced effects on the rest of the national economy are also very important. Particularly, food industry and other services, although other less salient indirect effects also exist, such as in the construction or in the automobile and aeronautical industries.

This innate systemic nature of the tourism industry, is not an aspect that has been traditionally considered in the legislation of policies. When producing national policies that are not strictly related to tourism, the knock-on effects these policies could have on tourism, such as on its development and competitiveness, are not explored

nor taken advantage. Nevertheless, during the current twenty first century, several of the different public authorities have incorporated these transversal and cross-industry considerations into the design and implementation of tourism policies.

2.2. Spain's national tourism policy: supporting talent and entrepreneurs

Within the evolution of Spanish tourism policies, there have been two general stages (Instituto de Estudios Turísticos, 2005):

The first stage comprises the period between 1905 and 1978. These dates, respectively, represent the birth of the first public Spanish governmental tourism department and the year in which the current democratic constitution was implemented. The tourism policies of this stage are characterised by the fact that quantity was valued over quality, promoting mass tourism. The main objective was to attain the highest possible quantitative growth of the tourism industry based on a centralised governmental intervention approach.

The second period begins in 1979 and continues until date. During this phase, the Constitution of 1978 transfers the responsibilities of tourism affairs to each of the composing federal Autonomous Communities of Spain [Comunidades Autónomas (CCAA)], marking the beginning of a regional design and management of tourism. This shift away from a centralised to a regional approach to tourism requires the coordination of tourism efforts and the design of new tourism policies based on differentiation with regards to quality, sustainability, information and innovation.

The Spanish Government tourism responsibilities during this democratic stage are, naturally, the tourism affairs and responsibilities that were not transferred to the different CCAAs, such as: the promotion in the international arena of Spain as a tourist destination; good decision making based on their experience, knowledge and intelligence of the tourism industry, on both the supply and demand side; long-term planning; and of course ensuring good coordination between the tourism efforts of all the CCAA.

Here follows a recompilation of the primary actions and policies conducted in the last decades in the tourism sector:

— *FUTURES I: Spanish Tourism Competitiveness Structural Plan (1992-1995):*

This was the first National plan designed by the National Government and the CCAAs (Turespaña, 1992). It stablished the necessary strategies for the tourism industry to consolidate its competitiveness within the heart of the Spanish economy. The implemented programmes marked a shift away from the traditional national tourism strategy. The programmes primarily focused on quality improvement, the development of human resources, the integration of new technologies and the diversification of the Spanish tourism products and services. One of the most notable aspects of this plan was the attempt to define in a clear manner the cooperative public-private relationships in the tourism sector.

— *FUTURES II: Spanish Tourism Competitiveness Structural Plan (1996-1999):*

FUTURES II was a continuation of the previous plan, although it incorporates a reformulation of the approach (Turespaña, 1996). Special emphasis was invested in the definition of a new tourism model, where sustainability gained a central role as FUTURES II joined tourism and territory under one sole concept. During this plan, the importance of human resource development was consolidated and seen as a necessary and fundamental factor for the improvement of the Spanish tourism industry.

— *PICTE: Spanish Tourism Integral Quality Plan (2000-2006):*

The context in which this plan is implemented is marked by economic expansion and by the recovery of the tourism sector. PICTE gave momentum and continuity to the previous above-mentioned efforts towards the improvement of Spain's tourism competitiveness (Turespaña, 2000). PICTE also takes place at a time of convergence with European Union (EU) programmes and initiatives. EU initiatives focused on quality and incorporated aspects of the business environment, the management of tourism destinations, as well as the implementation of environmental sustainability standards.

— *Spanish Tourism Horizon Plan 2020 (2008-2011):*

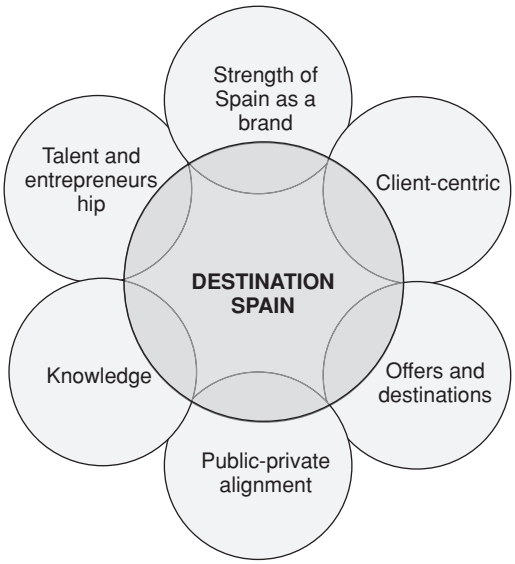
This plan is more commonly known as the 2020 Plan. It is characterised by its long-term perspective. Its main objective is to satisfy the new requirements of the tourism industry. It focuses on the economy of knowledge and information, on sustainability, it is a client-centric approach, and seeks to maximise cooperation and collaboration between all the agents of the tourism sector (Turespaña, 2008). This plan is the first to explicitly incorporate into its strategy the attraction and development of entrepreneurs. The most challenging objective is that of the economy of knowledge, as it is an intangible. Nevertheless, advancements in the economy of knowledge can be achieved through the incorporation, integration and development of talent. The 2020 Plan also highlights the imperative necessity of promoting innovation within the tourism industry, which is attainable through the incorporation and attraction of innovative entrepreneurs. It also incorporates into its competitiveness agenda the necessity to create the optimal environment to stimulate and facilitate the development of innovative and competitive tourism businesses.

— *National Integrated Tourism Plan (PNIT) (2012-2015):*

This has been the latest tourism plan, which entered into force in 2012 and terminated in 2015 (Turespaña, 2012). The plan's purpose was to provide a strategy that would ensure Spain maintained its position as an international tourism leader, which was under threat due to economic hardship caused by the crisis. The main differences between PNIT and the previous enacted tourism plans are: its national vision of Spain as a tourism destination in competition with other international destinations; its systemic and transversal nature; its strategic and operative nature; the coordination, control, measurement and transparency of its results. Out of all the measures this plan is composed of, it is worth noting the promotion of innovation in tourism

management, which is a vital ingredient to build a competitive tourism industry for the future. PNIT's strategy to integrate innovation in the tourism industry is based on the attraction of talent and entrepreneurs.

Figure 1. Entrepreneurial support provided by the National Integrated Tourism Plan (PNIT)



Source: National Integrated Tourism Plan (PNIT) (2012-2015).

PNIT has entrusted the *young entrepreneur* as its protagonist, due to his/her large potential, to introduce innovation in the management of the tourism industry. However, this potential will only be tapped into if the young entrepreneur has easy access to the necessary funds and financing required to develop and launch tourism related projects and businesses. Consequently, one of the major measures of this plan is to facilitate the access to finance that will allow the innovative entrepreneurs to put into action their projects. Three actions in particular have been articulated:

— Lines of credit for young tourism entrepreneurs (*EMPRENDETUR Programme*): Eligibility is for individuals below the age of 40. Its objective is to support the innovative tourism projects of young entrepreneurs during the initial stages, as well as to incorporate the dynamism of the young entrepreneurs into the business environment surrounding the tourism industry.
— Innovative tourism entrepreneurs programme (*EMPRENDETUR Programme*): Its objective is to support the development of innovative tourism business models, with the aim of improving the sector's profitability and competitiveness.
— Align the supply of research and training to the business' demand.

SEGITUR (State Company for Innovation and Tourism Technology Management). It is a policy department of the government involved in the management of the integration of innovation and technology into the tourism sector. SEGITUR has, amongst others, the following responsibilities [1]:

— The implementation of the INNPULSA portal and the operation of the one-stop-scheme.
— The creation of credit services for entrepreneurs.
— The establishment of a cooperative network that promotes entrepreneurial tourism.
— To facilitate the search of informal investors, such as «business angels».

The following sections of the article shall outline in a detailed manner the primary public and governmental actions that promote entrepreneurial tourism in Spain.

3. Primary public actions that support entrepreneurship and human capital in Spain's tourism sector

In general terms, there exists a traditional perception that the relationship between public administrations and entrepreneurship support is limited to the concession of subsidies to the entrepreneurs by the corresponding ministries. Entrepreneurs, however, have, in addition to subsidies, access to other various initiatives and can seek support from other Public Administrations (AAPP) different from the ministries. These alternatives can result more useful for the entrepreneur depending on the stage of his/her project.

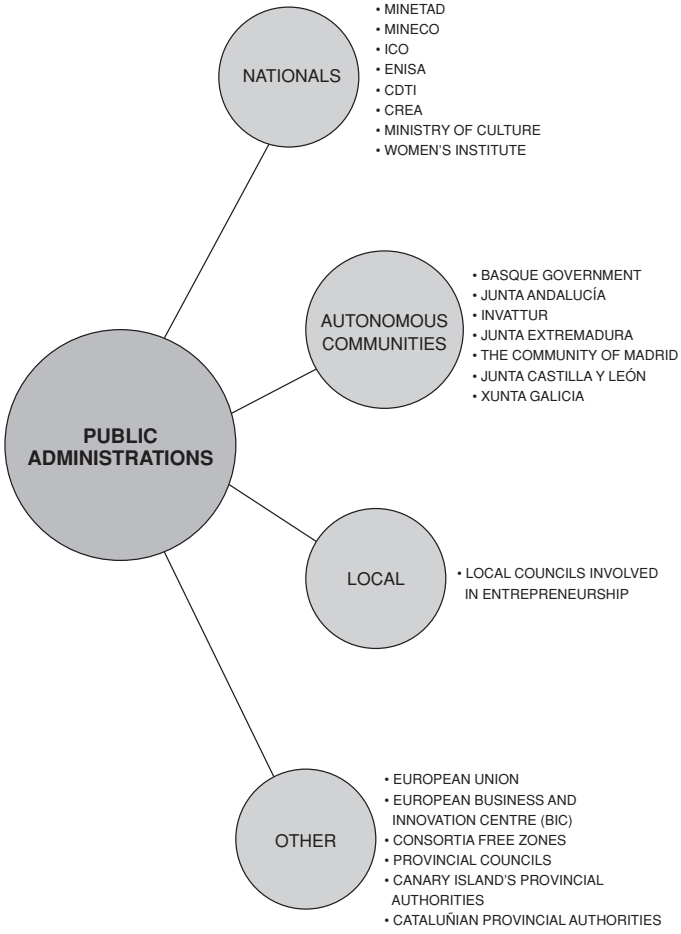
In this subsection, the primary efforts to support the development of entrepreneurship and human capital in the tourism sector by the various AAPPs in Spain shall be described. In order to do so, the article shall first outline the main non-industry specific entrepreneurial assistance mechanisms offered by the various AAPPs. It shall then move on to a more detailed description of programmes aimed exclusively towards promoting entrepreneurial tourism.

3.1. Typology of Public Administrations and of entrepreneurial support

As indicated previously, the central government is not the sole support mechanism for entrepreneurial tourism. A wide array of other institutions offer support to entrepreneurs. In fact, not only can the entrepreneur seek support from the different Spanish administrations, but also from the European Union (EU).

[1] In FITUR, additionally, Fitur Know-how & Exports takes place. It is an event of work and diffusion where SEGITTUR, in collaboration with ICEX Spain Exports and Investments and FITUR, explore avenues to promote the internationalisation of Spanish companies operating in the tourism industry.

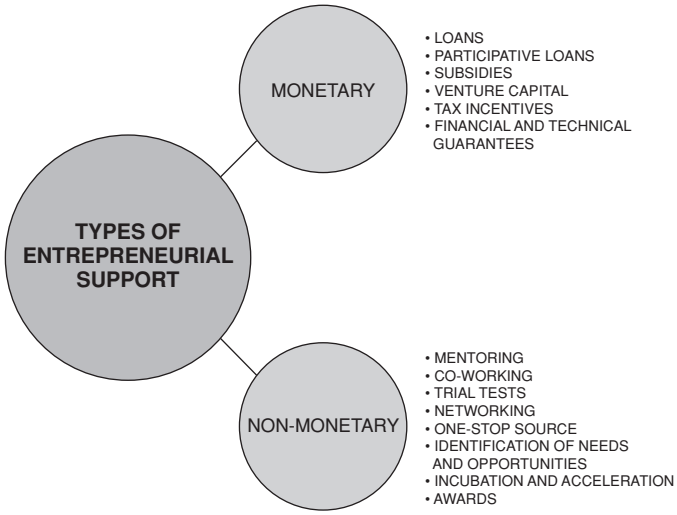
Figure 2. Typology of AAPPs that support to entrepreneurs



Source: own elaboration.

Therefore, all the different AAPP programmes aimed at supporting entrepreneurship employ different types of initiatives: from subsidies for entrepreneurs, to loans, mentoring programmes, co-working spaces and offices, fiscal incentives and guarantees. In order to tackle this analysis, a classification of different support actions and mechanisms has been developed. Such classification is based on whether the support is monetary or non-monetary, and also on which type of AAPP is providing the assistance (Figure 3).

Figure 3. Typology of entrepreneurial support mechanisms



Source: own elaboration based on data from the Ministry of Energy, Tourism and Digital Agenda (MINETAD), the Ministry of Economy, Industry and Competitiveness (MINECO) and from the CCAAs.

Monetary assistance:

— **Loan**. The grant of a loan for a determined period of time, at a variable or fixed interest rate, with a grace period.

  • Official Credit Institute (ICO): The «ICO lines for entrepreneurs and companies» provides financing targeted towards the self-employed, to companies as well as to public and private entities, of both national and foreign origin, as long as the investments, fruit of this financing, are productive for the national territory or/and require liquidity.

— **Participative loan.** A financing instrument which could be considered as a middle ground between a traditional loan and venture capital. It strengthens considerably the financial structure of companies.

  • National Company for Innovation (ENISA): The «ENISA lines for young entrepreneurs» is targeted towards recently funded small and medium companies by young entrepreneurs. Its intention is to provide financial resources for the entrepreneurs' business investments during the critical early stages. «ENISA lines for entrepreneurs» provides financial support in the early stages of small and medium companies funded by entrepreneurs without an age eligibility criterion. Its purpose is to facilitate the necessary investments for the project to develop.

— **Subsidies.** A mechanism where the monetary aid is not recovered.

  • Ministry of Culture. It offers programs to assist in capital investments with the aim of increasing the legal supply of cultural digital content in the in-

ternet and to promote the modernisation and innovation of the creative and cultural industries.
- Centre for Industrial Technological Development (CDTI): The «NEOTEC Programme». Its objective is to support the creation and consolidation of technology-based companies.
- Regional incentives in Extremadura. It is directed towards companies who invest in Extremadura. Its purpose is to support the creation of new companies and the consolidation of existing companies. It gives priority to projects involving company expansion, modernisation and relocation.

— **Venture Capital.** It involves the companies' capitalization with the aim of spurring its growth.
- ENISA: It supports both public and private initiatives in the attainment of venture capital funds, such as financing business projects with high prospects of growth.
- CDTI: Its programme INVIERTE has its own venture capital vehicles.

— **Tax incentives and tax bonuses.** The tax incentives are company tax reductions that compensate for the development of Research and Development projects and/or technological innovations. The tax bonuses are applied to the researcher's personal social security business quota.
- Ministry of Industry, Economy and Competitiveness. Its efforts and actions are oriented towards private sector initiatives, without conditioning the innovation plans of a company. i.e., it is not limited to specific industries, programmes or initiatives.
- Fuerteventura's Technology Park. It has developed a programme which incentivises start-ups to begin and stablish their entrepreneurial business endeavours in their island.

— **Financial and technical guarantees.** Operations through which the guaranteed attains financial or technical support from a financial entity or bank, who provides a series of financial or technical guarantees depending on the type of endorsement.
- CREA Reciprocal Guarantee Society (SGR): It's a non-for-profit financial entity who is subject to the supervision and inspection of the Bank of Spain. It is composed by two types of parties: the protectors and the participants. The protectors are the institutions who participate in SGR's capital, which is consistent with its social objectives. The participants are the small and medium companies who receive guarantees form the SGR[2].

In addition to the previously mentioned mechanisms to support entrepreneurship in Spain, the existence of a payment due to unemployment, called Unemployment Capitalisation, also deserves attention. Its objective is to facilitate the take-off of en-

[2] An SGR exists that specialises in Tourism. It guarantees cultural tourism projects, R+D+i and digital development.

trepreneurial projects of self-employment nature. There is also a programme called Entrepreneurial support for women, coordinated by the Women's Institute.

Within the entrepreneurial support efforts, apart from local, regional and national finance, the EU offers the «SME Instrument». It is a sub-programme of the eighth EU R+D+I Financing Horizon 2020 Programme. It is divided into 3 phases, from the business plan's project elaboration, to its development and its diffusion[3].

Non-monetary assistance:

Local, regional and other authorities, in general, provide business creation an entrepreneurial support programmes which are non-monetary. These non-monetary concessions should not be viewed as incompatible with monetary support programmes. In fact, complementarity between the two types of assistance does occur.

Various forms exist to describe this non-monetary assistance. Some CCAAs, such as the Community of Madrid, offer the service of a portal dedicated exclusively to entrepreneurship. This service offers information regarding support and assistance, as well as academic training in entrepreneurship centres. Other CCAAs, such as the Basque Country, have designed the acceleration programme «BIND 4.0», which provides training specifically for the development of commercial skills, mentoring, technological workshops, networks sessions with agents and business leaders of the Basque industrial and business environment, as well as access to finance, amongst many other actions. The «Programme Vía Galicia», promoted by the province of Vigo and the Galician regional authorities, offer support and assistance during the initial phases of the entrepreneurs' and businesses' endeavours. They provide seed capital, training, infrastructure and consulting advice. Similarly, the regional authorities of Castile and Leon have also put into action the «regional Strategy for Entrepreneurship, Innovation and Self-employment».

The analysis of these initiatives together with other similar programmes in Andalucía, Madrid or Barcelona, has identified the following non-monetary support mechanisms:

— **Mentoring**: entrepreneurs gain support and advice at the time of initiating a project from different professional specialists and experts in finance, marketing, technology, publicity, as well as legal assistance and many other activities.
— **Access to co-working spaces**: collaborative working spaces that public and private entities make available for entrepreneurs, such as accelerators and incubators.
— **Product testing**: agreements can be reached between entrepreneurs and AAPPs prior to launching the project.
— **Promotion of networking between entrepreneurs and companies**: collaboration with technology centres and companies.

[3] Phase 1: The concept and viability evaluation; Phase 2: Demonstration and commercial replication; Phase 3: Commercialisation.

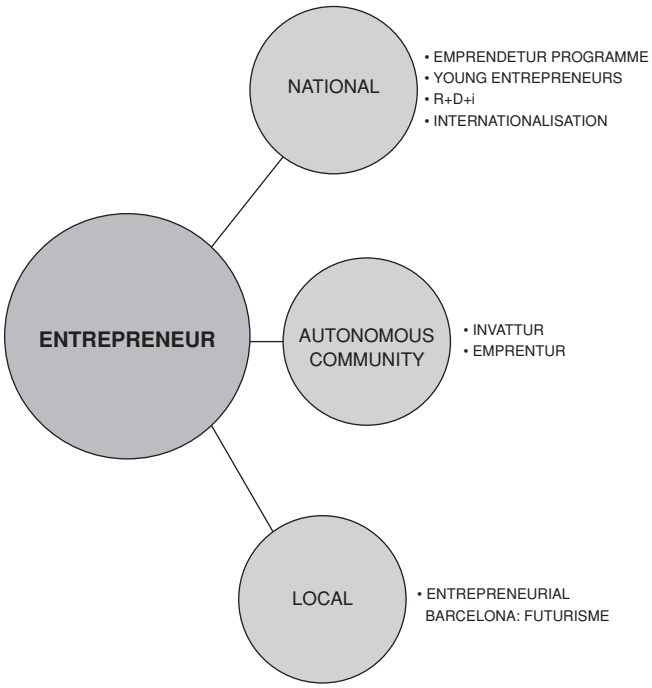
— Implementation of **one-stop-scheme for entrepreneurs**.
— **Identification** of business needs and ideas.
— **Incubation and acceleration of projects**.
— **Awards.**
— **Business angels Networks**: can eliminate the barrier between investors and entrepreneurs**.** The local council of the city of Madrid, for example, offers this service.

3.2. Tourism specific entrepreneurial support programmes

The above-mentioned programmes of assistance and support to entrepreneurship are not sector specific, and therefore, any industry is eligible to receive such support, including tourism.

There are, however, independently of the previously described programmes, AAPP programmes that are exclusively oriented towards supporting entrepreneurial tourism. These tourism-specific entrepreneurship support programmes are mainly due to the relevance and importance of the tourism industry for the local, regional or national economy (Figure 4).

Figure 4. Entrepreneurial tourism support programmes



Source: own elaboration based on data from the Ministry of Energy, Tourism and Digital Agenda (MINETAD), the Junta Andalucía, the Community of Valencia and the Council of Barcelona.

Amongst the tourism-specific entrepreneurial programmes, we can highlight the following:

Entrepreneurial Barcelona: «FUTURISME Programme». Its objective is to facilitate the creation of innovative companies. It is characterised by its long-term vision, as it is aimed to give answers and solutions to the needs and challenges of the Barcelona tourism sector. This programme offers: training and the attainment of entrepreneurial skills; advice on the progression of projects; entrepreneurial experiences; networking meals; awards for the best tourism initiatives.

Invattur: This project was developed by the Valencian Regional Tourism Agency. Notable aspects of it are: to facilitate and stimulate contact between entrepreneurs; the creation of business synergies; the discovery and analysis of new tourism business opportunities; the promotion of innovative and technological businesses as a differentiation strategy; and to aid entrepreneurs in their awareness of the opportunities and possibilities the tourism sector can offer their projects and businesses.

Junta Andalucía: It is involved in ensuring the growth of the tourism services and the creation of new tourism products. It does so through «PYMETUR» which focuses on the growth and the consolidation of tourism companies, and through «EMPRENTUR» which focuses on the creation of new tourism companies. It also grants subsidies with the finality to improve the competitiveness and productivity of small-medium and micro small-medium tourism companies. These subsidies facilitate their modernisation and allows them to implement innovative actions.

Spanish State Secretariat for Tourism: The objective of the programme «EMPRENDETUR»[4] is to promote business initiatives in the tourism industry. It achieves so through synergies between entrepreneurs, universities, businesses and investors who all seek innovative, competitive and profitable business models. It is composed by three lines of assistance:

— «Emprendetur for Young Entrepreneurs» (EJE).
— «Emprendetur I+D+i» (EIDi).
— «Emprendetur Internationalisation» (EI).

These 3 lines of assistance are reimbursable loans, amortising in 5 years and with a grace period of two years. The EJE does not require any form of guarantee, while EIDi and EI lines require a guarantee equivalent to 36% of the proposed loan.

[4] Order IET/2481/2012, 15 of November. Official Governmental Newsletter, number 279, 20 of November of 2012, pp. 80698 to 80731.

Order IET/2481/2012, 15 of November. Official Governmental Newsletter, number 279, 20 of November of 2012, pp. 80732 to 80763.

4. Spanish entrepreneurial tourism support: implications at the regional level

As mentioned in the preceding section, amongst the primary entrepreneurial tourism specific support mechanisms in Spain, the programme EMPRENDETUR, coordinated by SEGITTUR, stands out as the most relevant.

The Spanish State Secretariat for Tourism has, via EMPRENDETUR, granted over 80 million euros during the period 2012 to 2016. The four financing lines have facilitated the development of 314 innovative projects, and consequently, it has become fundamental for entrepreneurship in the tourism industry, as intended by the National and Integral Tourism Plan (PNIT) 2012-2015[5]. More than 70% of the beneficiary projects and companies of the EMPRENDETUR support lines had been in operation for less than five years at the time of application. In other words, most of the financed companies were companies in their initial and critical stages of development.

From a provincial stand point, the data on loans clearly reflects the polarization of the Madrid-Barcelona axis in the Spanish entrepreneurial tourism support services, where 68.3% of the financing took place in companies belonging to these two provinces. Valencia (5.3% of the total) and the Baleares (3.8%) are the only other two provinces with over ten beneficiaries. Girona, Malaga and Santa Cruz of Tenerife are the next set of provinces who benefitted the most out of these support mechanisms –5 benefiting companies each. It is worth noting that 15 provinces and cities (which represent 29%) did not obtain any financial support. None of them, however, where included in the 2016 list of the 25 provinces with the most number of companies. All the Spanish provinces with no EMPRENDETUR financing are situated in the interior of the Iberian Peninsula, except for Huelva which is located on the south Atlantic coast. It is worth highlighting, therefore, the importance of the tourism industry, and in particular the traditional sun and beach model, for the Spanish economy when analysing these entrepreneurial support programs.

[5] This shall be the last Plan of Governmental National Tourism Policy. From 2016 onwards no tourism policy at the national level shall exist. Nevertheless, tourism policy actions can be exercised by the central government, such as the 2016 EMPREDENTUR.

Figure 5. Provincial map of Spain regarding EMPRENDETUR financed projects, 2012-2016

Source: own elaboration based on data from the Ministry of Energy, Tourism and Digital Agenda (MINETAD).

When one focuses on regions rather than provinces as the territorial organisation of Spain, the Autonomous Communities of Madrid and Catalonia collectively represent 70.9% of all the loan beneficiaries. The six communities of the peninsular interior, excluding Madrid, (Castilla-La Mancha, Castile and Leon, Aragon, Navarra, Extremadura and La Rioja) barely represent 5.3% of the national total (Figure 6). The only two regions which received no financing whatsoever where Melilla and la Rioja. Interestingly, the latter, la Rioja, is the region least visited by non-resident tourists and who also hosts the smallest number of tourism companies.

Figure 6. CCAA ranking based on the number of EMPRENDETUR beneficiaries, 2012-2016

Autonomous Community	*Contract-awarded Companies*	*% total*
Community of Madrid	100	37.7
Catalonia	88	33.2
Valencian Community	17	6.4
Andalusia	13	4.9

Autonomous Community	*Contract-awarded Companies*	*% total*
Balearic Islands	10	3.8
Canary Islands	6	2.3
Galicia	6	2.3
Castilla-La Mancha	4	1.5
Castile and Leon	4	1.5
Basque Country	4	1.5
Aragon	3	1.1
Asturias	3	1.1
Cantabria	2	0.8
Navarra	2	0.8
Ceuta	1	0.4
Extremadura	1	0.4
Murcia	1	0.4
Melilla	0	0.0
La Rioja	0	0.0
Total	**265**	**100.0**

Source: own elaboration based on data from the Ministry of Energy, Tourism and Digital Agenda (MINETAD).
Note: Some of the beneficiaries have more than one EMPRENDETUR financed project.

By focusing on the regional data concerning Research, Development and Innovation (R+D+i) expenditure, Madrid and Catalonia's dominance can be observed. Both regions lead the statistics on the percentage of the AAPP budget dedicated on R+D+i investment in intangibles (fundamental for start-ups) and on company's expenditure on research (over 3,771 million euros in 2016, representing 53% of the national total).

If a comparative analysis were undertaken based on the number of tourism companies per CCAA, employing the data available from INE, the four first places in 2016 would be occupied by the CCAA who also lead in the number of contract-awarded companies. Such ranking is headed by Catalonia with around 79,000 companies, followed by Andalusia (in the region of 74,000 companies), Madrid (around 65,000) and Valencia (around 47,000 companies).

Amongst the EMPRENDETUR beneficiaries, a comparative analysis can also be produced based on the type of client (B2B, B2C, B2B2C)[6], type of company

[6] B2B (Business-To-Business): business between companies, whereby the client of a company is another company; B2C (Business-To-Consumer): business whereby the company's client is a consumer; B2B2C (Business-To-Business-To-Consumer): business whereby a company's clients are both consumers and other companies.

(technological or not) and on the tourism sector it operates. The results for the Community of Madrid, Catalonia and for the country as a whole, would be the following (Figure 7):

Figure 7. Geographical comparison on type of client, type of company and on tourism sector financed by EMPRENDETUR

Geographical comparison by type of client						
TYPE OF CLIENT	*Territory*					
	Community of Madrid	*% total*	*Catalonia*	*% total*	*Spain*	*% total*
B2B	58	58.0	44	50.0	142	53.6
B2C	32	32.0	39	44.3	99	37.4
B2B2C	10	10.0	5	5.7	24	9.1
Total	**100**	**100.0**	**88**	**100.0**	**265**	**100.0**

Geographical comparison by type of company						
TYPE OF COMPANY	*Territory*					
	Community of Madrid	*% total*	*Catalonia*	*% total*	*Spain*	*% total*
Technological	94	94.0	85	96.6	250	94.3
Non Technological	6	6.0	3	3.4	15	5.7
Total	**100**	**100.0**	**88**	**100.0**	**265**	**100.0**

Geographical comparison by type of tourism activity financed by EMPRENDETUR						
TOURISM SECTOR	*Territory*					
	Community of Madrid	*% total*	*Catalonia*	*% total*	*Spain*	*% total*
Leisure activities	19	13.8	21	22.1	57	16.1
Travel agencies	11	8.0	7	7.4	22	6.2
Accommodation	40	29.0	34	35.8	114	32.1
Destinations	14	10.1	14	14.7	41	11.5
Food and beverage services	22	15.9	8	8.4	54	15.2
Transport	18	13.0	5	5.3	38	10.7
Other	14	10.1	6	6.3	29	8.2
Total	**138**	**100.0**	**95**	**100.0**	**355**	**100.0**

Source: own elaboration based on data from the Ministry of Energy, Tourism and Digital Agenda (MINETAD).
Note: one same project could be directed to various sectors. Some of the beneficiaries have more than one EMPRENDETUR financed project.

As can be observed from the tables above, the dominant type of client of the two CCAAs, and for the country as a whole, follows the same distribution: over 50% of the financed projects were granted to B2B companies. The financed projects are generally technological companies, with nearly identical percentages for the country as a whole and for the two analysed CCAAs (between the 94% observed in Madrid and the 97% in Catalonia). Therefore, two EMPRENDETUR financing characteristics concerning the destination of the funds stand out: the supported projects are predominantly technological and are issued primarily to B2B companies.

It is noteworthy that the majority of the EMPRENDETUR beneficiaries are technological companies that act as external providers for the tourism industry, service and product developers, and solution providers for Tourism subsectors. The tourism activity which has received the most EMPRENDETUR financing is accommodation (29% of the companies in Madrid, and 36% of the Catalonia companies). Leisure activities for the whole of Spain and Catalonia, and the food and beverage sector in Madrid, are the second tourism activities that received the most entrepreneurial financial support.

A ranking table can be constructed based on the amount of EMPRENDETUR financing each CCAA has received. Once again, the Community of Madrid leads such list with 33.2 million euros (41.4% of the national total), followed by Catalonia with 24.5 million euros (30.6% of the total) and the Valencian Community who summed a total of 5.2 million euros (6.5% of the total) in granted financial support. Aragon and Castilla-La Mancha are the CCAA that present the highest financial aid per project ratio. For instance, Aragon shows a ratio of 945,000 euros per financed company (Figure 8).

Figure 8. CCAA ranking based on the quantity of EMPRENDETUR financing received and on average quantity per loan

Autonomous Community	*Euros*	*% of Total*	*Average quantity per loan*
Community of Madrid	33,159,882	41.4	331,599
Catalonia	24,520,258	30.6	278,639
Valencian Community	5,207,572	6.5	306,328
Andalusia	4,491,311	5.6	345,485
Aragon	2,836,801	3.5	945,600
Castilla-La Mancha	2,764,408	3.5	691,102
Balearic Islands	2,396,927	3.0	239,693
Galicia	1,704,044	2.1	284,007
Basque Country	828,212	1.0	207,053
Canary Islands	660,520	0.8	110,087
Murcia	368,606	0.5	368,606
Navarra	354,053	0.4	177,027

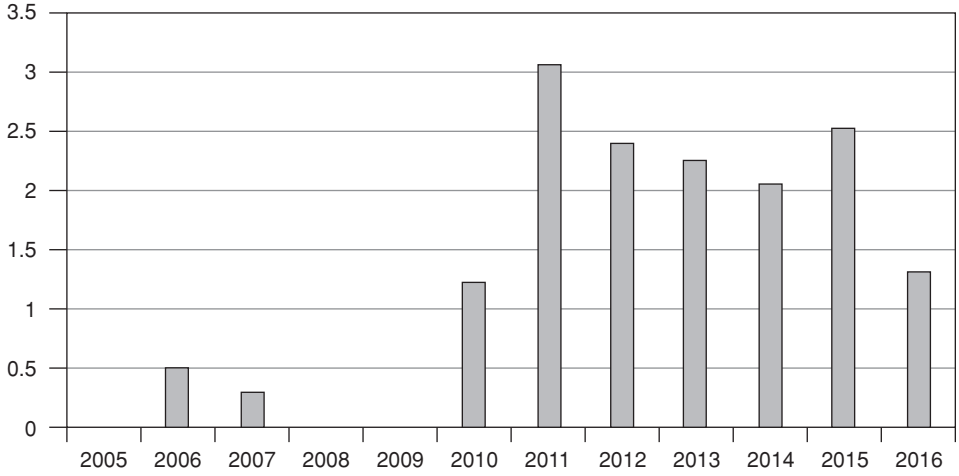
Autonomous Community	*Euros*	*% of Total*	*Average quantity per loan*
Asturias	315,264	0.4	105,088
Cantabria	240,402	0.3	120,201
Castile and León	114,433	0.1	28,608
Extremadura	99,972	0.1	99,972
Ceuta	13,000	0.0	13,000
Melilla	0	0.0	
La Rioja	0	0.0	
Total	**80,075,664**	**100.0**	**302,172**

Source: own elaboration based on data from the Ministry of Energy, Tourism and Digital Agenda (MINETAD).
Note: Some of the beneficiaries have more than one EMPRENDETUR financed project.

The impact of EMPRENDETUR financing on companies is very significant. Employment, taking into consideration the 95 financed projects between 2012 and 2014, increased 26.8%. In addition, the 43 financed companies between 2012 and 2013 experienced a 23.3% growth in revenue.

It is worth highlighting also the financing efforts of the National Company for Innovation (ENISA), which is part of the Ministry of the Economy, Industry and Competitiveness. From 2005 to 2016, ENISA has offered a total of 188 loans, amounting to 15.6 million euros and representing 2.1% of all facilitated financing. The primary recipients of these loans are companies of the leisure and hospitality sectors (Figure 9).

Figure 9. Millions of euros loaned to companies by ENISA in the leisure and hospitality sectors (2005-2016)



Source: own elaboration based on data from the Ministry of Energy, Tourism and Digital Agenda (MINETAD).

5. Conclusions

Entrepreneurship, innovation, human capital, talent. All of these concepts should go hand-in-hand with the tourism industry. In our current days, both academically and professionally, the possibility of Spain maintaining its world leading tourism industry is inconceivable unless these concepts are developed, deepened, promoted and conceived as Spain's competitive differentiation strategy. The tourism industry is particularly exposed to the integration of new technologies, which in itself enables the integration of other intangible factors that spur productivity.

During the recent years, the tourism companies aware of the necessities and reality of the industry have begun to develop strategies where innovation and new technologies are at its heart to ensure market positioning both within Spain and internationally. In addition to these private initiatives, there is a growing implementation of public tourism policies that promote quality, knowledge, sustainability and innovation in the tourism sector.

The public sector, therefore, plays a major role in the industry's revitalisation and sustainability, particularly by supporting entrepreneurship, human capital and talent. This article has analysed the public policies that have supported entrepreneurial tourism in Spain in the last decades, without forgetting the associated initiatives of human capital, innovation, knowledge and talent, etc.

The article has explained in detail the different tourism plans produced by the Government, which is increasingly biased towards the promotion of a more sustainable tourism model and a higher quality tourist destination. In order to construct a tourism industry that will be competitive in the future, a series of measures have been progressively implemented to enhance the attraction and formation of entrepreneurs. Special emphasis has been placed on the empowerment of young tourism entrepreneurs and on programmes associated with tourism innovation.

The article has also shown that, in the case of Spain, entrepreneurial support in the tourism sector is not only the result of subsidies from the central government, but also due to the rich basket of initiatives offered by the different administrations that entrepreneurs have access to. The article has highlighted the interest of the different public Spanish administrations in entrepreneurship and their efforts to support it in the best possible manner.

The Spanish State Secretariat for Tourism's EMPRENDETUR programme has received special attention in this article. Its different lines of financing action have led it to become the most important public entrepreneurial tourism support mechanism in Spain. It has also served to launch the National Integrated Tourism Plan (PNIT), which has granted over 80 million euros to over 300 innovative projects via its three lines of actions: «Emprendetur for young entrepreneurs», «Emprendetur R+D+i», «Emprendetur Internationalisation».

The granted assistance is geographically concentrated in the Autonomous Communities of Madrid and Catalonia (and within these, the provinces of Madrid and Bar-

celona), followed by Valencia and Andalusia. Regions of the interior of Spain, however, have barely participated in the entrepreneurial tourism support mechanisms. In the Community of Madrid and Catalonia, as well as in Spain as a whole, the majority of the financed projects are predominantly technological involving companies whose main client is another company (B2B), particularly in accommodation activities.

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Section ARTICLES

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Tourism accessibility competitiveness. A regional approach for Latin American countries

Natalia Porto *, Ana Clara Rucci **, Matias Ciaschi ***

ABSTRACT: Tourism competitiveness is a topic of concern for everyone involved in planning, investing and studying the tourism sector. Researchers face challenges in measuring competitiveness and evaluating which issues to include in their analyses. The aim of this work is to determine to what extent adequate accessibility —defined as a set of conditions that a destination should have to be used optimally by individuals, including people with disabilities— represents an additional determinant for tourism demand, in a regional context. Using data from 17 Latin American countries during the period 1995-2015, we estimate a gravitational panel data model with fixed effects and show that the attractive assets declared by UNESCO as world heritage sites, as well as the component of accessibility, together increase international tourism demand. In this way, this paper shows the value of prioritizing discussion of issues like accessible tourism to reach a broad and «modern» measurement of competitiveness.

JEL Classification: R1; O32; L83; J14.

Keywords: tourism accessibility; regional tourism demand; competitiveness.

La competitividad turística en accesibilidad. Una aproximación regional para países latinoamericanos

RESUMEN: La competitividad turística es un asunto de preocupación para todos aquellos involucrados en el planteamiento, la inversión y el estudio del sector turístico. Los investigadores se enfrentan constantemente a retos con respecto a la medición de la competitividad y a la evaluación de qué aspectos incluir en sus análisis. El propósito de este trabajo es determinar hasta qué punto una accesibilidad adecuada —definida como un conjunto de condiciones que un destino debe tener

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para ser usado de manera óptima por individuos, incluyendo personas con discapacidades— supone un determinante adicional para la demanda turística, en un contexto regional. Utilizando datos de 17 países latinoamericanos durante el periodo 1995-2015, estimamos un modelo gravitacional de datos de panel con efectos fijos y mostramos que los atractivos turísticos declarados por la UNESCO como patrimonio de la humanidad, junto con el componente de accesibilidad, combinados, aumentan la demanda turística internacional. De esta forma, este artículo muestra el valor de priorizar la discusión de aspectos como el turismo accesible para conseguir una medida amplia y «moderna» de competitividad.

Clasificación JEL: R1; O32; L83; J14.

Palabras clave: accesibilidad turística; demanda turística regional; competitividad.

1. Introduction

Over the last decade, tourism researchers have shown particular interest in identifying, measuring and systematizing variables that determine the competitive position of tourism destinations. These variables are important for management decisions made by policymakers, destination managers, tourism entrepreneurs and other stakeholders (Pulido-Fernández and Rodríguez-Díaz, 2016). Do accessibility, technological aspects of smart destinations, innovation, and sustainability hold a place in the measurement of competitiveness? In this paper, we focus on one of these dimensions, accessibility, to shed some light on its definition, alternative methods of measurement, and its potential relationship with technological aspects of smart city destinations.

This work aims to determine to what extent adequate accessibility serves as a determining factor for regional tourism demand. We define adequate accessibility as a set of conditions that a destination must possess to be used optimally by all persons, including those with disabilities. Using data from 17 Latin American countries during the period 1995-2015 we estimate a gravitational panel data model with fixed effects to analyze the determinants of tourism flows. The results show that the UNESCO declaration of tourist attractions as heritage sites, as well as a component of accessibility, increase international tourism demand. This paper illustrates that several fundamental issues need to be taken into account in order to formulate an encompassing and «modern» definition of competitiveness. It proposes that accessibility is key among these.

Why should accessibility be taken into consideration? Two primary facts illustrate its significance. First, more than a billion people, or about 15% of the world's population, are estimated to live with some form of disability (based on 2010 global population estimates); by 2050 this figure is set to increase to approximately 1.2 billion (WHO, 2011). Other non-disabled persons may also benefit directly or indirectly from enhanced accessibility, including pregnant women, people with temporary dis-

abilities, seniors, and families with young children; together these groups constitute more than one-fifth of the world's population (Domínguez, Darcy and González Alén, 2015). We expect disability to be an even greater concern in the future, as its prevalence increases alongside an aging population, given that the risk of disability is higher among older adults. The global increase in chronic diseases such as diabetes, cardiovascular diseases, cancer and mental health disorders (WHO, 2011) also indicate that these numbers will increase. Second, the Convention of Rights of People with Disabilities (UN, 2006), an international treaty of human rights, includes accessibility and participation in cultural life, recreation, leisure and sport as a specific right for persons with disabilities. People with disabilities often choose not to travel for vacation due to a combination of factors, including a lack of reliable information, lack of financial resources, and negative prior experiences (Gfk, 2015). A lack of accessible services and places can curtail many disabled persons' desires to travel (Neumann and Reuber, 2004). UNWTO (2014) considers accessible tourism as an opportunity for economic, social and cultural growth.

Accessibility should not only be considered a right but also as an essential issue in city planning. Improved accessibility has the potential of developing general well-being, increasing the usability and enjoyment of touristic sites, services, and products, and capturing a new segment of the tourist market. It can also make sites more competitive. In this sense, this paper conducts an initial exercise of including a broad concept of accessibility in the explanation of regional tourism flows. Ultimately, it aims to see an accessibility indicator included as a part of a competitiveness measurement in destination competitiveness models.

2. Literature Review

2.1. A broad conceptualization of destination competitiveness

The concept of competitiveness, fundamentally related to international trade theories, has a long history in economic literature. Garelli (2006) outlines the evolution of the idea of competitiveness, tracing its evolution from Adam Smith in 1776 to the current vision of Porter at the beginning of the 1990s. In recent times, factors like the 1970s oil crisis, the Latin American fiscal crisis of the 1980s, and innovations and technological improvements in each country, explain the growing importance of competitiveness measurements (Chudnovsky and Porta, 1990). Thus, this concept ceases to be sustained solely by international trade theory or national market protection, and instead incorporates issues such as economic well-being and quality of life (Fagerberg, 1988; Fajnzylber, 1988; Jones and Teece, 1988). In this way, defining and measuring the phenomenon of competitiveness is not a simple task. It is a multidimensional, relative and complex concept that encompasses many elements, some of which are difficult to rigorously measure (Gooroochurn and Sugiyarto, 2004). Competitiveness in tourism has become more relevant in the literature since the 1990s but correctly measuring it still represents a challenge. The transversality of the tourism

sector and the lack of unique criteria in its definition complicate efforts at quantification.

Since the first public presentation of the conceptual model of competitiveness in tourist destinations in 1993, Ritchie and Crouch (2003) have promoted the continuous review and modification of variables that make up a competitiveness model. The model is determined by sociocultural, economic, anthropological, technological, behavioral and environmental factors, among others. It takes comparative and competitive advantages into account and is based on two strengths: the destination's resources (human, physical, knowledge, historical and cultural, availability of capital, tourist infrastructure, and size of the economy) and its capacity to use those resources over the long-term (audit and inventory, growth and development, efficiency and effectiveness, and maintenance). The model recognizes a global environment through the identification of the previously mentioned factors (economic, technological, environmental, political, legal, sociocultural and demographic) and includes the most important elements for characterizing a destination's tourism competitiveness. For their part, Dwyer and Kim (2003) present a comprehensive approach to measuring tourism competitiveness in destinations based on the Ritchie and Crouch (2003) model, with the difference that they group together planning and tourism development factors.

One of the most commonly used measures of tourism destination competitiveness is the Travel and Tourism Competitiveness Index (TTCI) developed by the World Economic Forum (WEF) in 2007. It defines competitiveness as «the set of institutions, policies, and factors that determine the level of productivity of a country» (WEF, 2010:4). The TTCI provides a global tourism competitiveness index and four competitiveness sub-indices: i) enabling environment; ii) travel and tourism policy and enabling conditions; iii) infrastructure, and iv) natural and cultural resources. In order to develop these indices, available data is organized into 14 pillars of tourism competitiveness, which are split, in turn, into 90 competitiveness variables or indicators. Even though the TTCI has been criticized for not making use of previous tourism research (Crouch, 2007), for the weakness of its prediction ability (Mazanec and Ring, 2011) and the arbitrary weighting of the variables within each pillar (Pulido-Fernández and Rodríguez-Díaz, 2016), it is nevertheless a first step towards measuring destination competitiveness, based mainly on economic factors.

Other models have revised the components included in a measure of destination competitiveness. In their work, Gooroochurn and Sugiyarto (2005) develop and use the World Travel and Tourism Council's Tourism Competitiveness Monitor (TCM), emphasizing that technology and social indices are the most important factors in determining competitiveness. Keeping in mind the challenges of measuring tourism destination competitiveness, Ring (2011) questions whether it is feasible to actually measure overall competitiveness in an undifferentiated way. A sound measure of competitiveness for the whole tourism industry that could also serve as a reliable predictor of performance or growth is desirable. However, it is difficult to capture the tourism industry, in all its heterogeneity, in one single index. A question that

still needs to be answered is how competitiveness in different kinds of tourism and markets is connected to overall competitiveness of a nation. In a theoretical sense, destination competitiveness lends itself to a hierarchical construct, i.e. countries will exhibit different levels of competitiveness in different parts of the industry as well as in different markets; regions within a country will also not be equally competitive. It is still unknown how much this complexity should be taken into account in models of total competitiveness[1].

Although a great number of studies have focused on measuring the competitiveness of tourism destinations (Ritchie and Crouch, 2003; Dwyer and Kim, 2003; WEF, 2011), others have looked at technological and social indices (Gooroochurn and Sugiyarto, 2005), and a few have studied accessibility in tourism in the context of competitiveness, though not in a broader sense (Madeiro Barbosa, 2008; Domínguez, Darcy and González Alén, 2015; Porto and Rucci, 2016).

2.2. Accessible tourism destinations

Madeiro Barbosa (2008) applied a methodology to measure competitiveness in 65 tourism destinations in Brazil based on five macro-variables: infrastructure (general and access); tourism (tourism infrastructure, tourist attraction and promotion of destinations); public policies; economy (economic activities and business capacity); and sustainability (social, environmental and cultural aspects). These included a total of thirteen micro-variables. Examining one of these macro-variables (tourism), this study includes a measurement of compliance with the access requirements for persons with disabilities. Although the main objective of the research was not the measurement of accessibility in tourism, it is one of the first competitiveness investigations that include accessibility as a variable in competitiveness destination measurements. Starting in 2008 and based on the information detailed above, Brazil's Ministry of Tourism computed the National Tourism Competitiveness Index, which has included, since 2011, the measurement of accessibility as one of its variables (access). Since 2013, accessibility has been included for three other variables: general infrastructure, tourist services and equipment, and tourist attractions. The 2015 index results show that accessibility conditions increase the competitiveness value of the different variables.

In another investigation of destination competitiveness, Domínguez *et al.* (2015) consider 17 attributes and focus on the measurement of two variables: level of accessibility (degree of access) and the number of accessibility products and services offered. The authors analyze competitiveness in accessible tourism between Australia and Spain at the country level as well as for the tourist regions of both countries. They use a cluster analysis, suggesting three possible accessibility situations:

[1] Some authors point out the need to discuss how the concept of destination competitiveness can be brought closer to the central point -namely, the visitor's experience (Crouch and Ritchie, 1999; Dwyer and Kim, 2003; Hong, 2009).

i) destinations that have advanced in tourist accessibility through the offer of specific products; ii) destinations that have identified the accessible tourism market as a business opportunity and incorporated accessibility conditions as a policy of differentiation; and iii) destinations that are not working to improve tourism accessibility and, therefore, will not have advantages derived from the exploitation of this segment or, indirectly, from the segment of family and senior tourism. While the study concluded that tourism destinations in both countries illustrate similar behavior, interesting findings emerged in the detailed comparison. It was observed that intrinsic tourism attractions such as climate, location, or tourism structure are more important for Spain, whereas the quality of services, brand and infrastructure were more significant for Australia's competitive position. The investigation suggests that any tourism destination has the potential to become an accessible tourism market. In the cases studied, there existed a concordance of demands to promote the development of infrastructure, products, services, promotion and marketing information, and the provision of adequate information for people with disabilities. Finally, the findings suggest that a destination's competitive factors are country-dependent and that destination competitiveness must be considered according to different types of disabilities because the needs of people with disabilities vary. For instance, larger cities tend to be the main focal points of greater accessibility (for example, Sydney, Melbourne, Madrid and Barcelona) [2].

The UNWTO (2015) conducted another effort to measure accessibility tourism and has published a model of indicators to measure accessibility as part of the tourism value chain. The model has eight stages (and sub-stages); each stage includes a number of indicators. In the first, UNWTO suggests a definition of the tourism value chain and then application of the given indicators, which must be evaluated through the following key-issues: access, cleanliness, common spaces, management, information and communication, mobility, staff training, services, and use. While considered a comprehensive measurement of accessible tourism, this method has the disadvantage of being very difficult to put in practice: the information required is often difficult to come by.

Recently, Porto, Rucci and Ciaschi (2016, 2017) completed several studies related to accessible tourism and competitiveness. Porto and Rucci (2016) developed a methodology to measure accessibility in tourism, in a broad sense. This study is

[2] Another study, Kastenholz, Eusébio, Figueiredo and Lima (2012), presented the municipality of Lousa in Portugal's initiative to become the first accessible tourism destination in that country. Lousa has a long history of supporting initiatives for persons with disabilities, given the area's nature and rural tourism potential. The study, which showed the results of the Lousa project, consisted in an analysis of the municipality's potentialities to enhance its competitiveness and the central strategy to become an accessible destination. These strategies included making the accommodation units more accessible, generating a certificate called «Lousa Accessible» to award those establishments that had invested in making their products and services more accessible, create an accessible route to observe the destination's wildlife, among other. The study indicates that Lousa used accessible tourism as a strategic tool to gain competitiveness by attracting an underserved and typically loyal market, and by creating a culture of social responsibility that would enhance a shared, human vision of the destination amongst stakeholders, including tourists, who increasingly value socially-responsible positions.

built on an examination of overarching tourism destination competitiveness from a disability and accessibility perspective. It takes into account variables that show the political will of countries for accessible tourism, including the population of people with disabilities, legal frameworks, government capacity to implement legislation that supports tourism infrastructure, and services that cater to travelers with disabilities. Special focus is granted to accessibility at UNESCO World Heritage Sites in each country. In Porto, Rucci and Ciaschi (2016) six countries of Latin America (Argentina, Brazil, Chile, Paraguay, Uruguay and Venezuela) for the 1995-2014 period are analyzed. Some results indicate that accessibility has been increasing over the years, especially since 2006. The Convention of Rights of People with Disabilities (CRPD) and the 2010 conditions of accessibility for the World Heritage Sites, have both made an impact. According to this study, Brazil and Argentina have greater accessibility in terms of the political will (legal frameworks, organizations for the treatment of tourism and disability, national programs) and at World Heritage Sites. Porto, Rucci and Ciaschi (2017) also applied a revised version of the Porto and Rucci (2016) index related to tourism specialization for four South American countries (Argentina, Brazil, Chile and Uruguay), showing that when destinations become more accessible, in a broad sense, the change has a positive effect on tourism flows.

2.3. A future step in competitiveness: smart accessible cities

Recent literature has begun to consider accessibility as one of the four axes (innovation, technology, sustainability and accessibility) for the development of smart cities and smart destinations. The accessibility component makes it an important item to be included in the measurement of competitiveness.

The Ministry for Industry, Energy and Tourism of Spain (2015) considers that a country, region or industry's leadership over time depends on its ability to anticipate the future and consciously prepare itself to welcome the best possible conditions. Given this, the study shows the decision to invest in a transformation of the Spanish tourism model in 2012 using an structure based on innovation, technology, sustainability, and accessibility, secured both the present and the future of tourism in the country.

Lheureux-De-Freitas and Macanar (2013) present the case of Porto Alegre in Brazil, which employed different initiatives to become a smarter city. One of those initiatives is accessibility. A Master Plan for accessibility was created to make Porto Alegre a pioneer in the country on the issue, it considered: i) the «accessible route», a project to make service, tourism and culture sites accessible to all; ii) the «blue area», free parking to people with disabilities; iii) the «free pass», an initiative through which mentally, physically, visually or hearing disabled persons are entitled to free passes on buses, as long as their monthly income does not exceed six times the minimum wage; iv) a public employment access program for persons with disabilities, and v) Ombudsman's Special Department for Social Inclusion and

Accessibility that deals with complaints by persons with disabilities concerning city services.

Suryotrisongko, Kusumaa and Ginardib (2017) provide a concept for a smart city designed as a disability-friendly environment. Four standards are defined to make smart city designed with persons with disabilities in mind: accessibility, safety, problem solving, and flexibility. Accessibility means that disability service facilities should be easily accessible and not difficult to use; safety means that disability service facilities does not cause harm; problem solving is a standard used as a determinant of the feasibility of facilities, describing if the service facility is in accordance with the needs of the problem rather than creating new problems; flexibility reflects whether the service facilities provided are easy to use anywhere, anytime, and by anyone.

3. Explanation of the accessible tourism index

As already noted, this work computes a broad measure of accessible tourism as an index. It lays out the conditions of accessibility in the tourism sector showing, on the one hand, political willingness for accessibility tourism in a country and, on the other hand, tourism accessibility as a measured component of destination competitiveness.

The index computes four components: i) international tourism and the share of population with disability; ii) legal framework; iii) policy, and iv) access conditions in tourism resources (Table 1). Therefore, it sets out a logic that shows that, if a country has people with disabilities, which it recognizes as a vulnerable population (WHO, 2011) with needs that must be attended to, and international tourism in that country is significant, the government must guarantee the full exercise of rights to persons with disabilities; the tourism sector is a critical arena for such achievement. In this way, the index is a tool that shows: i) the political will of the countries through the existence of laws that establish rights; ii) the implementation of such willingness, through the existence of organizations that design and develop policies with disabled persons in mind, and iii) the conditions of access at tourism attractions and World Heritage Sites (UNESCO)[3,4].

Table 1. Accessibility tourism index

I. International tourism and disability importance
i. Population with disability - Total population relationship.
ii. International tourist arrivals (number of arrivals) - Total population relationship.

[3] The methodology of the accessible tourism index is described in Porto and Rucci (2016) and Rucci (2018).

[4] Because of lack of information, the index does not include information on smart destinations variables.

II. Legal Framework
i. Adherence to the Convention on the Rights of Persons with Disabilities (CRPD) and its Optional Protocol. ii. Considerations of PWD rights into Constitution. iii. Tourism normative regulation. iv. Disability normative regulation. v. Accessible Tourism normative regulation.
III. Policy
i. Tourism organization. ii. Disability organization. iii. Accessible Tourism organization.
IV. Access Conditions in tourism resources
i. Access conditions in the World Heritage Sites (UNESCO).

Source: elaborated by authors.

Developing a methodology that can measure accessibility in tourism serves a practical contribution to the literature; it strengthens and supports research on disability while also fulfilling WHO recommendations (2011) for the improvement of disability data collection. It prioritizes nine areas of implementation, organized by sector (health, education, social protection, labor, transport, housing) and actors (governments, civil society organizations, including disabled people's organizations, professionals, the private sector, and people with disabilities and their families). WHO (2011) also mentions that it is fundamental that methodologies for collecting data on people with disabilities be developed, tested cross-culturally, and applied consistently. Data must be standardized and internationally comparable so that it can be used for benchmarking, to monitor progress regarding disability policies, and for the national and international implementation of the CRPD. Moreover, to improve the well-being of the disabled community, studies on accessibility must be supported.

4. Methodology and estimations

In this work, an analysis of the economic determinants of regional tourist flows is made for 17 Latin American countries for the period 1995-2015 using a panel data model; this method permits variability for both time and the countries' dimensions (cross section).

The role of accessibility, calculated by computing the previously mentioned index, is included.

The equation to estimate (in natural logarithm) is the following:

$$Y_{it} = \alpha_{it} + \gamma_i + \beta_1 \text{Acces}_{it} + \beta_2 \text{Sites}_{it} + \beta_3 \text{Acces}_{it} * \text{Sites}_{it} + \beta_4 GDPpc_{i,t} + \\ + \beta_5 \text{Pop}_{i,t} + \beta_6 \text{rer}_{it} + \beta_7 \text{crisis}_{it} + u_{it} \quad (1)$$

where Y_{it} represents the tourist inflow to country i in period t; α_{it} is the constant of the regression; γ_i are characteristics of country i, which are assumed to be constant over time. Acces_{it} represents the accessibility index of country i at time t; Sites_{it} makes reference to the number of heritage sites in country i in year t. Lastly, $GDPpc_{i,t}$, represents the Gross Domestic Product per capita of country i in period t; $\text{Pop}_{i,t}$ expresses the population of the country i for period t; rer_{it} is the real exchange rate of country i in period t; and $\text{crisis}_{i,t}$ is a dichotomous variable that takes the value of one if a crisis happened in the country i during this period; and u_{it} is the error term that complies with the properties that ensure the consistency of the regressors.

According to the theory and the empirical evidence, we expect a positive sign both in the coefficient associated with country population and its GDP per capita. This is because both variables represent the size of a nation; GDP per capita, in particular, indicates the country's degree of development and, as a result, would indicate more favorable conditions for economic activity and tourism. The coefficient associated with a country's real exchange rate is also expected to have a positive sign as, in principle, a greater value implies that the country offers a cheaper alternative to its competitors in tourism services. The coefficient associated with an economic crisis is expected to have a negative sign: a country that is suffering from social or economic instability, for security reasons, becomes less attractive to potential tourists.

Finally, we expect that the coefficients associated with the number of heritage sites and the accessibility index still have positive signs. As mentioned, evidence suggests that the appointment of tourist attractions as heritage sites by UNESCO encourages tourism demand. Regarding the accessibility index, we expect improved facilities —in broad terms— at these sites will generate a greater influx of tourists. The estimation of this last coefficient represents the main motivation of this work; its calculation reflects an effort to encourage the inclusion of accessibility in existing measures of tourism competitiveness.

In the literature, it is common to use fixed-effect estimates with panel data (Cheng and Wall, 2004; Vargas da Cruz, Camargo Rolim and Vampre, 2007) to estimate the econometric model presented in equation (1). We discard Ordinary Least Squares (OLS) estimates because this method cannot capture unobserved heterogeneities across countries, and thus results in biased and inconsistent estimators of the interest coefficients. To avoid this problem, one can make estimations with fixed effects or random effects. In this work, we choose to renounce the gains in efficiency given by random effects estimates; we instead used the gain in consistency which implies the use of fixed effects estimates. In this way, it is possible to control for all unobservable heterogeneities that do not vary in time, or that vary only slightly.

Additionally, it is possible to perform a Hausman test that indicates, in terms of consistency of the estimates, if it is convenient to use random effects or fixed effects. Test results provide evidence that rejects the null hypothesis that both estimators are consistent for all levels of significance. We also performed a test of absence of fixed effects; these results suggest that, for all levels of significance, there is evidence to reject the null hypothesis of the absence of fixed effects.

In conclusion, both the existing literature and the econometric theory support the use of fixed effects methodology to estimate the coefficients of equation (1) and, in particular, those associated with the number of heritage sites in the country and the accessibility index, both of which are of central interest in this work.

5. Alternative accessibility measures

It is possible to create alternative measures of this variable that generate a better analysis of the effect of accessibility on regional tourist demand.

The first alternative measure we define in this work is the remoteness of accessibility. Based on a definition of remoticity already applied in the literature[5], a new index is computed. Instead of taking into account the distance between alternative destinations, we consider the accessibility of potential competitors. For example, the remoticity accessibility index for one country in one year is given by the sum of the ratios of the accessibility index to GDP per capita for its potential competitors, in the region, in that year. The advantage of this indicator, given the econometric specification of fixed effects used, is its greater variability both temporally and between countries. This variability allows for improved estimation of the effect of accessibility on tourist arrivals.

The remoticity of accessibility is defined as:

$$RemAcc_{i,t} = \sum_{h} \frac{Accesibility\ Index_{i,h}}{GDP_{h,t}}$$

Where *i* indexes the country of interest (the country for which the index is calculated), whereas *h* references the rest of the countries in the region.

Another alternative to measuring accessibility is to consider the difference in the accessibility of each country with respect to the average accessibility for the region, for each year. For example, for one country in one determined year, we first compute the average accessibility index of the region and then we compute the difference between that value and the accessibility index for each country for the same year.

6. Results

The results of this work are exposed in Tables 2-4. Models a, b and c (Table 2) use the accessibility index shown in section 3. The specifications d, e, and f (Table 3) use the remoticity accessibility index as a measure of accessibility. The g, h

[5] The remoticity index (Anderson, 1979; Deardorff, 1998) refers to how far apart spatially the country i and its potential competitors are. That is, it is a sum of distances weighted by the size of the economies of the alternative destinations. For a detailed explanation on the remoticity index, see Porto, Garbero and Espínola (2013).

and i models (Table 4) consider the difference in the countries' accessibility with respect to the regional average. The analysis is reinforced by estimating the models b, c, f, g, h and i, controlling first by capital inflow variables, as in the work of Yang, Lin and Han (2010), and second, by trade volume, as in Roh, Bak and Ming (2015). Capital inflow is measured by direct foreign investment (FDI), which is used as a proxy for the volume of business carried out by foreigners within each country. The volume of trade refers to the total sum of goods and services exchanged abroad; that is, the total sum of imports plus exports. The results seem to reaffirm that the dependent variable reflects the behavior of recreational tourism and not that of business tourism[6].

Table 2. Determinants of international tourism - Accessibility index

Tourist Inflow	*(a)*	*(b)*	*(c)*
Population	1.162*** (0.373)	1.216*** (0.394)	1.297*** (0.382)
GDP	0.708*** (0.0878)	0.763*** (0.0901)	0.671*** (0.0974)
Real Exchange Rate	–0.0512 (0.0705)	–0.0995 (0.0707)	0.000832 (0.0750)
Crisis	–0.0645* (0.0381)	–0.0631* (0.0380)	–0.0601 (0.0400)
Accessibility Index	0.244*** (0.0539)	0.316*** (0.0505)	0.245*** (0.0536)
Constant	7.464*** (0.659)	8.940*** (0.638)	7.737*** (0.673)
Observations	324	324	319
R-Squared	0.726	0.769	0.728
Number of countries	17	17	17

Standard erros in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3. Determinants of international tourism - Accessibility remoteness index

Tourist Inflow	*(d)*	*(e)*	*(f)*
Population	1.216*** (0.394)	1.784*** (0.377)	1.058*** (0.399)
GDP	0.763*** (0.0901)	–0.0618 (0.149)	0.768*** (0.0944)

[6] Estimations are available upon request.

Tourist Inflow	*(d)*	*(e)*	*(f)*
Real Exchange Rate	–0.0995 (0.0707)	0.164** (0.0766)	–0.124* (0.0710)
Crisis	–0.0631* (0.0380)	–0.0463 (0.0355)	–0.0671* (0.0376)
Accessibility Index	0.127*** (0.0387)	0.191*** (0.0373)	0.120*** (0.0387)
Constant	7.833*** (0.681)	9.075*** (0.661)	8.080*** (0.689)
Observations	313	313	308
R-Squared	0.708	0.748	0.710
Number of countries	17	17	17

Standard erros in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4. Determinants of international tourism - Accessibility versus average accessibility

Tourist Inflow	*(g)*	*(h)*	*(i)*
Population	1.297*** (0.382)	1.519*** (0.367)	1.166*** (0.383)
GDP	0.671*** (0.0974)	0.0231 (0.149)	0.661*** (0.0996)
Real Exchange Rate	0.000832 (0.0750)	0.199** (0.0800)	–0.0245 (0.0756)
Crisis	–0.0601 (0.0400)	–0.0420 (0.0383)	–0.0636 (0.0396)
Accessibility Index	0.103** (0.0519)	0.141*** (0.0500)	0.110** (0.0517)
Constant	7.636*** (0.662)	8.726*** (0.662)	7.903*** (0.672)
Observations	324	324	319
R-Squared	0.698	0.726	0.701
Number of countries	17	17	17

Standard erros in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Within the presented models, all the estimated coefficients of interest have the expected signs and are significant in explaining tourism demand for the 17 Latin American countries. The only exception can be found with the real exchange rate:

given the heterogeneity of exchange rates in the countries included in the sample, we can expect that the estimated coefficient will not be significant. In sum, these results suggest that accessibility (measured by the index) is a relevant determinant of tourism demand in the Latin American sample and can explain even a 30% of demand, depending on the specification used.

7. Conclusion

Over the last decade, tourism researchers have held particular interest in identifying, measuring, and systematizing the variables used to determine the competitive position of tourism destinations. These calculations are important factors in decisions made by policymakers, destination managers, tourism entrepreneurs, and by stakeholders, in general (Pulido-Fernández and Rodríguez-Díaz, 2016). What place do accessibility, technological aspects of smart destinations, innovation, and sustainability, hold in the measuring of competitiveness? In this paper, we focus on one of these dimensions —accessibility— to shed some light on its broader definition, alternative ways to measure it, and its potential relationship with technological aspects of smart cities destinations.

Although a number of studies have focused on measuring the competitiveness of tourist destinations (Ritchie and Crouch, 2003; Dwyer and Kim, 2003; WEF, 2011) and several include technological and social indices (Gooroochurn and Sugiyarto, 2005), only a few have studied accessibility in tourism in the context of competitiveness (Madeiro Barbosa, 2008; Domínguez, Darcy and González Alén, 2015; Porto and Rucci, 2016; Rucci, 2018). More recently, accessibility began to be considered as one of four axes (innovation, technology, sustainability, and accessibility) for the development of smart cities and smart destinations (Kastenholz, Eusébio, Figueiredo and Lima 2012; Lheureux-De-Freitas and Macanar, 2014; The Ministry for Industry, Energy and Tourism of Spain, 2015; Suryotrisongko, Kusumaa and Ginardib, 2017). Accessibility in tourism is a challenge that those seeking destination competitiveness must take on. These issues highlight the potential of accessible tourism as a destination competitiveness measure. However, it is important to keep in mind that this potential should be combined with concrete action to generate the conditions of full accessibility, including investments in infrastructure, human resources training, and promoting awareness on the subject. Accessibility and the universal design of tourism products, services and environments guarantee full use of rights. Recognizing the rights of people with disabilities (in its broadest definition) is one of the most important goals of contemporary society. When these rights include the enjoyment of recreational, cultural and recreational activities, two key issues appear: first, that people with disabilities possess the right to tourism and, second, the consequent need to incorporate accessibility as a means of effectively recognizing that right

In this paper, a broad measure of accessible tourism is computed as an index, allowing for the identification of necessary future policies at the national and regional levels. It sets out to consider the conditions of accessibility in the tourism

sector, taking into account, on one hand, the political willingness of a country, and on the other, the issue of tourism accessibility, which includes a destination competitiveness measure. The results of the exercise presented in this paper show that, for our case study of the Latin American countries, the approach used to measure tourism accessibility goes in the right direction: the models showed that accessibility is important in explaining international tourism demand. Now, the challenge is to consider it as a determinant of competitiveness tourism destination and to learn how to measure it.

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Section ARTICLES

Journal of Regional Research Investigaciones Regionales

Hotel online pricing policy: A review and a regional case study

Manuela Pulina *, Valentina Santoni *

ABSTRACT: This paper provides a literature review on hotel online pricing policy. The review covers pricing strategies from three different perspectives: demand, supply and regional characteristics. From the demand side, the reviewed literature shows that electronic word-of-mouth (e-WOM) influences hotel room revenue and overall performance. Also, e-WOM represents key information for hotel managers to understand customers' needs as well their degree of satisfaction and loyalty. Notably, reputation, built on online customers' reviews, has an increasing role in online pricing policy. On the supply side, research is still scarce and mostly anchored to the standard competition framework. The review reveals that hotel pricing strategy requires more innovation within a rather volatile and dynamic online market. Besides, through a statistical analysis, this paper generalizes further the finding that hotel online pricing policy is highly influenced by overall accessibility to and mobility within a region.

JEL Classification: L83; R32; R1.

Keywords: hotel; demand; supply; regional characteristics; online pricing policy.

Política *online* de precios del sector hotelero: una revisión y un caso de estudio regional

RESUMEN: Este artículo proporciona una revisión de literatura sobre la política de precios *online* del sector hotelero. La revisión comprende estrategias de precios desde tres perspectivas diferentes: demanda, oferta y características regionales. Desde el punto de vista de la demanda, la literatura revisada muestra que el boca a boca electrónico (denominado e-WOM) influye en los ingresos por habitación y también en el desempeño global. Además, el e-WOM se convierte en información clave para que los gerentes de los hoteles comprendan mejor las necesidades de los clientes, además de permitirles conocer su grado de satisfacción y lealtad. De manera notable, la reputación, basada en las opiniones de los clientes, tiene un papel cada vez mayor en la política de precios *online* de los hoteles. Desde el punto

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de vista de la oferta, son bastante escasas las investigaciones existentes y, en su gran mayoría, están ancladas en el marco de referencia estándar de la competitividad. La revisión realizada revela que la estrategia de precios *online* de los hoteles requiere de una mayor innovación, dentro de un mercado *online* dinámico que presenta cierta volatilidad. Además, a través de un análisis estadístico, este artículo generaliza aún más el hallazgo de que la política *online* de precios del sector hotelero está altamente influenciada por la accesibilidad general y la movilidad dentro de una región.

Clasificación JEL: L83; R32; R1.

Palabras clave: hotel; demanda; oferta; características regionales; política de precios *online*.

1. Introduction

Academic papers are more and more devoted to investigate hotel online pricing policy. The research is starting to build new frameworks to better understand the dynamic of online prices in the tourism activity, based on the characteristics of the classical forces, demand and supply, as well as on the geographical location of the hotels.

The purpose of this paper is to provide a literature review on this thread of research. One of the objectives is to investigate in what measure demand, supply as well as regional characteristics, such as accessibility and mobility, influence online pricing strategies. The search on the relevant literature was based on peer-reviewed economics journals, with a specific focus on tourism journals. To this aim, well-established search engines have been used such as ISI, WebScience, Scopus, Google Scholar.

From a demand perspective, numerous studies are devoted to investigate the role of consumers' word-of-mouth in the hospitality sector. Such a traditional communication has further expanded by the introduction of the communication technology. Consumers tend to read, use and post information on the internet either ex-ante or ex-post of their purchase or experience. This posted information is defined as electronic Word-of-Mouth (e-WOM, see for example Buhalis and Law, 2008). The impact of e-WOM on customers' preferences and their willingness to pay is more remarkable for the service sector. The intangible and experiential nature of services increases the degree at which customers perceive risk in their consumption. Therefore, consumers tend to search more information from previous customers who have actually experienced a specific service (Papathanassis and Knolle, 2011).

Nowadays, it is well established that the popularity of search and release of information when shopping online encourages customers to rely on these sources of online information before proceeding with the purchase. Customers' preferences of a specific product are highly and positive correlated to the number of online reviews (Viglia *et al.,* 2014). In this respect, as a typical service industry, hotels rely on e-WOM as one of the key marketing channels that influences their business profitabil-

ity. In fact, e-WOM represents a significant information source for hotel managers to understand customers' needs and preferences and, hence, it becomes a powerful tool to enhance the quality of the supplied services (Phillips *et al.,* 2017). Price dynamics tend to be also closely correlated to short-run and long-run hotel performance (Kim *et al.,* 2016). Hotels have to closely evaluate their online reputation as a means for adopting pricing strategies that, ultimately, will influence their competiveness and, hence, the economy of regions and destinations.

On the supply side, research is still scarce and mostly anchored to the standard competition-oriented framework. A literature review proposes novel studies that have attempted to analyse in what manner hotel online pricing policy adjusts not only to demand shocks, but also to online market competition and innovation.

As a final aim of the paper, a statistical analysis is pursued to further generalize previous work that assessed the impact of geographical characteristics, in terms of accessibility and mobility, on online pricing policy set by hotels (Alegre *et al.,* 2013; Costa, 2013; Yang *et al.,* 2018a; Yang *et al.,* 2017). A representative sample of online hotels based in the Italian region of Sardinia is analysed. To this aim, data on single and double room prices, set both in the low and high season, are retrieved from *Booking.com*.

The paper is organized in the following manner. The next section offers a literature review on online tourism demand and its effects on hotels profitability and pricing policy. Section 3 presents a literature review on the role of supply and innovation in setting pricing strategies. In Section 4, the role of regional characteristics on online pricing policy are highlighted and a statistical investigation is presented as a case study. In the last section concluding remarks are drawn.

2. Tourism demand

2.1. Consumers' motivations and expectations: E-WOM and hotels profitability

Through the analysis of several research papers, it is possible to identify the key factors that lead users to provide a review on purchased tourism services. As main reasons in providing reviews by consumers, most of the studies, here analyzed, highlight aspects such as «quality of service», «customer satisfaction and dissatisfaction» and «social identity and sense of belonging to the community» (Crotts *et al.,* 2009; Swanson and Hsu, 2009; Kim *et al.,* 2009; Casaló *et al.,* 2010; Sun and Qu, 2011; Sánchez-García and Currás-Pérez, 2011; Nusair *et al.,* 2011; Bronner and Hoog, 2011; Casalo *et al.,* 2015; Gvili and Levy, 2016; Zervas *et al.,* 2017; Yen *et al.,* 2019; Yang, 2018b).

According to Bronner and Hoog (2011), the most frequent motivation to perform e-WOM is to provide useful information to allow others to make a satisfactory choice. Furthermore, some of the research findings reveal that negative reviews can be en-

countered more often than positive reviews. Yet, Swanson and Hsu (2009) argue that customers, who have experienced satisfying experiences, are not necessarily inclined to recommend the service or to persuade others to use the same services. In this line of research, Sánchez-García and Currás-Pérez (2011) adopt an unusual perspective in the literature by proposing that dissatisfaction, caused by perceived service failure, tends to trig for emotional processes that lead consumers to experience and manifest through their reviews specific emotions such as anger, disappointment which, in turn, may induce agents' behavioural response. Potential consumers are then inclined to spread a negative e-WOM, probably with the purpose of warning others and inducing them to be more aware about their choice.

In terms of consumers' emotional involvement, Hu and Kim (2018) examine the effects of e-WOM motivations on customers' e-WOM behaviour. The authors reveal important implications for the hotel sector and online marketing managers. First, self-enhancement and enjoyment is the most important drive for hotel guests to spread positive e-WOM. Moreover, according to the authors, positive online comments are related more to a pleasant stay rather than economic incentives. Hoteliers should ensure that each guest has the opportunity to feel unique thanks to the provision of impeccable services and facilities. A negative experience is the most critical motivational drive for guests to write negative online reviews.

Several studies have also explored the impact that reviews, provided by consumers, have on the hotel sector. Specifically, authors tend to highlight how especially positive judgments can increase the number of bookings and, consequently, the productivity of the firm, thus providing hoteliers with important information for their marketing strategies. Qiang *et al.* (2009) empirically investigate the impact of online consumer-generated reviews on hotel room sales. Utilizing data collected from the largest travel website in China, the authors develop a fixed effect log-linear regression model to assess the influence of online reviews on the number of hotel room bookings. In details, the study shows that positive online reviews can significantly increase the number of bookings, while the variance or polarity of e-WOM (*i. e.* rather volatile judgments or their total absence) exerts a negative impact on the number of online sales. Qiang *et al.* (2011) conduct a further study to identify the impact of online user-generated reviews on business performance, using data extracted from a major online travel agency in China. The empirical findings show that traveller reviews have a significant impact on online sales. Notably, the variable that mostly affects the reservations is related to the average and variance of the judgments.

In addition, Lin and Xu (2017) suggest that reviews not only have an effect on perceived reviewer trustworthiness, but also on brand attitude and purchase intention. A positive review enhances reviewer trustworthiness since it is viewed by potential consumers as being fair and believable, and it can predict a stronger purchase intention while vice versa a negative review. Mauri and Minazzi (2013) also assess that the prevalence of positive/negative comments will increase/decrease the hotel purchase intention and the level of potential consumers' expectations. Blal *et al.* (2014) analyse the tourist market in the city of London, through data on 319 hotels from

tripadvisor.com. The results show a positive correlation between the ratings and volume of reviews, and hotels' revenue. Positive reviews generate an increase in sales, while negative reviews generate a decrease. Specifically, ratings have a larger effect on upper-tier hotels, while volume of reviews drives the lower-tier hotels' results.

On the whole, several other studies have identified a link between the volume of reviews and hotels' revenue. Experts have advocated that increasing the volume of online reviews can help mitigate negative comments (Teixeira and Kornfeld, 2013), improve consumer perception (Viglia *et al.,* 2014), and eventually, improve operational performance (Kim *et al.,* 2015). Therefore, as stated by García *et al.* (2017), indicators such as rating and volume are able to influence consumers' willingness to pay.

A further line of research explores in what measure hotel guests reviews, posted on consumer-generated websites, have an influence on consumers' decision-making process and service expectations. Mauri and Minazzi (2013), through survey data gathered on students or young graduates in the main university cities in Northern Italy, reveal a positive correlation between hotel purchasing intention and customers' expectations with respect to the review rating. Moreover, hotel managers' responses to guests' reviews exert a negative impact on customers' purchasing intentions. Tsao *et al.* (2015) show that positive reviews can have a significant effect on booking intentions amongst those individuals who are strongly inclined towards conformity. Conversely, a higher number of reviews prove to be more persuasive amongst those individuals who are characterized by a low degree of conformity. Another thread of research relates to the effects of social networks. In this respect, Ladhari and Michaud (2015) explore the influence of comments published on Facebook on friends' intentions to book a specific hotel, the trust and the attitude towards this hotel, and the perception about its website. A survey conducted on a sample of Canadian students, under the age of 35, has confirmed all the hypotheses on the remarkable influence of such comments that are able to drive users' decision-making process.

There are several studies that show that guests' rating on hotels is a determinant variable that should be considered when implementing pricing policy. Qu (2014) find that the inclusion of additional reviews, obtained from other travel sites, can provide hotels more reliable information for assessing the effect of customers' opinions on business productivity. Torres *et al.* (2015) also explore the impact of a hotel rating and number of reviews on the value generated through online transactions. Through a sample of 178 hotels, representing various types of firms and brands within the United States, the authors assess that ratings in TripAdvisor, as well as the number of reviews, are positively correlated to the average size of each online booking transaction. Hence, regarding e-WOM volume, a large number of comments is desirable only for firms with positive ratings that meet clients' expectations. Indeed, for these firms, the positive effect of rating can be even more strengthened by volume. Therefore, hospitality operators should make an effort to satisfy their clients as well as encourage them to publish online feedback. In this manner, firms' online reputation will increase allowing hotels to raise their prices and obtain a higher profitability for their business.

2.2. Demand and pricing policies

On the demand side, several studies find that customers' rating boosts hotel performance and affects hotel room prices (Ogut and Onur Tas, 2012; Lu and Stepchenkova, 2012; Nieto *et al.,* 2014; Hernández-Maestro and Muñoz-Gallego, 2014; Viglia *et al.,* 2016b; Guizzardi *et al.,* 2017). Acar *et al.* (2012) remark that hotels need to follow effective and efficient promotional policies based upon effective dynamic pricing strategies. In this respect, Abrate and Viglia (2016) suggest that hospitality operators should adjust their prices in line with reviewers' evaluations about their accommodation. Hence, online reputation, by means of online customers' reviews, plays an increasing role in pricing making decisions.

In terms of dynamic pricing strategy, Viglia *et al.* (2016a) remark that an important indicator is the so-called «reference price». This price is a benchmark that consumers use to evaluate prices on the market and purchase a specific product. In particular, the authors show how pricing and discounting policies affect reference price formation. The more often and the longer hotel room rates are discounted, the more likely the discounted rate becomes the reference price, and the more difficult will be for hotels to recover their reputation and value in consumers' minds. Less mature companies tend to adopt discounts and aggressive pricing tactics in an uncontrolled way. Such companies will jeopardize reference price levels.

A further drive of pricing policy relates to customers' characteristics and clustering. Abrate *et al.* (2012) analyze the dynamic price decisions within the hotel sector. The authors conclude that the inter-temporal pricing structure often depends on a price discrimination policy based on customers' clusters, stars rating, as an indicator of quality, and the number of services supplied. Empirical results show that when customers belong to the business cluster, the lowest prices seem to be set in the time span immediately preceding customer staying. On a weekend, when the leisure cluster is predominant, prices tend to increase when approaching to the check-in date. Wu *et al.* (2014) show that a randomized pricing strategy tends to generate higher profits than a flat pricing strategy. The authors suggest that the online retailer should adopt the discounted price for only one period and then return to the baseline price. When low-type consumers are more patient, the retailer should decrease the promotion frequency and, simultaneously, adopt a high price. Moreover, the online retailer should diminish the promotion frequency and the high price and, simultaneously, increase the low price to encourage high-type consumers, who value time more, to purchase at the high price.

From a standard economics perspective, García *et al.* (2017) remark that hotels tend to implement their pricing strategies based upon forecasted levels of demand, demand price elasticity as well as competitors' prices. Yet, the higher volatility of the online market place makes more and more difficult to make predictions and forecasts demand pattern. The role of pricing policy in online transactions should able to maximize sellers' profits having in mind consumers' product evaluations (Kim *et al.,* 2009). As suggested by Guo *et al.* (2013a), an appropriate policy of market segmentation developed through an online reservation system would benefit both hotels and

consumers. By reaching an optimal number of demand segments, firms would obtain higher profits, while consumers would gain considerable price discounts. The authors also show that, if the number of demand segments were higher than the optimal size, the profits would decrease, since the extra profit due to the additional segment can not cover the increase in operating costs.

3. Supply and online pricing policy

As the standard economics theory suggests, the level of supply influences price dynamics. Prices tend to increase when there is a scarcity of hotels available to book-in in a certain area (Ibrahim and Atiya, 2016). Abrate and Viglia (2016) support that tactical price decisions tend to be influenced by the amount of online real-time competitors. On the same line of research, Balaguer and Pernìas (2013) conduct a study on the relationship between the number of competitors and hotel prices in Spain. A higher density of competitors implies, on average, a lower price dispersion. The findings suggest that the entry of a new competitor in the neighbourhood will force a reduction in the optimal level of prices in the area. For midweek days, the effect on price level will be higher if the new entrant offers the same quality of accommodation. The effect of a new hotel on the price level will be also lower at the weekend, where there is a higher proportion of potential consumers. Becerra *et al.* (2013) argue that the degree of local competition mitigates the effect of differentiation on pricing policy; but hotels characterized by higher quality services (expressed in terms of number of stars) can better withstand the entry of new competitors that would impose price cuts. Furthermore, Xie and Kwok (2017) provides insight on the impact of innovators as Airbnb on hotels, in a increasingly competitive hospitality market, driven by ever-changing technology and innovation. The study empirically considers in what measure Airbnb pricing policy affects the performance of nearby hotels through the lens of price difference and price dispersion.

Pricing policy are also influenced by other factors such as the presence of large events and taxation, although the thread of this research is still scarce. As an example, Herrmann and Herrmann (2014) investigate hotel prices in Munich under the influence of the Oktoberfest. In particular, the author analyses how the event affects the daily online price level as well as hotels price differentials. In general, average hotel prices are very volatile over time. Munich hotels tend to set prices according to expected demand and vary prices depending on the day of the week during the event.

Online Travel Agencies (OTA) also play an important role in tourism web marketing via online brokerage agencies (Internet Distribution Systems, IDS). These are portals where consumers can compare different offers, read the reviews and make a reservation. Nowadays, OTA have become a key distribution channel for many hospitality firms providing not only the possibility to hold reservations, but also a higher visibility to hotels. Several papers are devoted to explore the role of OTA in hospitality and tourism research (Guo *et al.,* 2013a; Blal and Sturman, 2014; Ling *et al.,* 2014; Mellinas *et al.,* 2015).

The use of OTA platforms is also a useful tool for monitoring and managing e-WOM (Yang, 2018a, b). Sorzabal *et al.* (2013) remark that IDS are an essential tool for the tourism sector since these provide a flexible way for changing prices at a real time. Raguseo *et al.* (2017) show that hotels listed on multiple OTA are able to boost sales revenue and operating profitability. The authors explore in what manner a higher visibility influences firms' business profitability. They find that those hotels that have chosen to advertise their rooms on a higher number of OTA are able to boost sales and business profitability and, thus, capture more economic value from their visibility on these distribution channels. On the opposite, the authors show that visibility on TripAdvisor in the form of either higher review ratings, larger review volumes, and higher variance in ratings and hoteliers' responses has no significant effect on revenue and business profit growth. As a further outcome, Xiang *et al.* (2017) indicate that, within the hotel sector, TripAdvisor is widely perceived as a leader as a data source due to the number of reviews available, a wide distribution of customers' preferences, an adequate length of consumer reviews together with support and reputation.

In the hospitality sector, revenue management has advanced significantly in recent decades and is recognized to have an important impact on dynamic pricing techniques (Melis and Piga, 2017). Oses *et al.* (2016) remark that monitoring the performance of a destination is essential for effective destination management. As the hotel sector is one of the main destination management stakeholders, it is important to have an agile monitoring system to evaluate its performance. Amongst others, Rodríguez and Ballestero (2017) suggest that to positively influence customer perceptions, hotel businesses should develop revenue management practices. Management strategies, if applied in an adequate manner, may induce buyers' perception of fair treatment with respect to the set prices. Yet, the authors argue that only large and chain-affiliated hotels can afford a specialized revenue management software and expertise. In this respect, Ivanov and Ayas (2017) investigate the revenue management practices of accommodation establishments in Turkey through a survey of 105 managers. The findings indicate that, in general, hoteliers do not have a revenue management system that is usually under the responsibility of a general manager, front office manager or marketing manager. Revenue management practices are mostly adopted by high category, chain affiliated, urban and seaside hotels with large number of rooms. Melis and Piga (2017) find that 4-5 star online hotels, with respect to lower star firms, are characterized by a more dynamic pricing policy where a revenue management system plays an important role. Yet, the authors emphasise that the introduction of such a system does not depend necessarily on financial constraints, rather than by lack of technological skills as well as by the firm organization and culture.

4. Regional characteristics and online pricing policies

Firms' geographical characteristics also play an important role in setting a pricing policy (Phillips *et al.,* 2015; Yang *et al.,* 2017). Yang *et al.* (2018a) investigate the

influence on hotel prices by market accessibility as well as by various quality-signalling factors, such as online ratings, recommendation percentage, hotel typology, chain affiliation. The study indicates that often low market accessibility (e.g. high flight costs; scarce mobility) leads to lower prices, although such an influence tends to be mitigated by a well-established reputation gained through the high quality-signalling factors.

Xun and Yibai (2016) find that the determinants that lead to customers' satisfaction or dissatisfaction toward hotels are often specific to particular types of hotels. The authors highlight that the determinants of satisfaction are generally the same for all the different types of structure (*i. e.* location and accessibility, staff performance and empathy, quality of rooms and restaurant). Dissatisfaction factors are instead more various for each type of hotel, compared to those that drive satisfaction. These include elements such as environmental issues, slow Wi-Fi, poor quality restaurants, noise, malfunctioning or old furniture, and staff unfriendly and/or unavailable. For hotels with limited services, environmental issues or noise are more influential as dissatisfactory factors. For hotels characterized by luxurious services, with food and drinks facilities, a dissatisfactory factor is the poor quality of the restaurants. Finally, for luxury hotels, without food and drinks facilities, the poor quality of the room (*i. e.* old furniture and malfunctioning) is the most factor for dissatisfaction.

Location, accessibility and mobility within a region tend also to affect pricing strategies, as shown by Alegre *et al.* (2013). The authors find that a negative relationship between the prices and the distance to the beach for German and British package holidays. A mixed evidence was captured on the relationship between prices and the distance to the centre of the tourist resort: positive for the British tourists, while negative for the German tourists. This assumption is further confirmed by Costa (2013) who argues that prices depend on hotel category, accommodation types as well as on the geographical location.

More recently, Latinopoulos (2018) examines the effect of sea view, together with other structural and location attributes, on room rates. Specifically, the author tests whether rooms with a sea view denote higher prices than other room types, thus quantifying the associated aesthetic and rent value of coastal areas where tourism-related development is a key economic activity. The results indicate that local natural resources tend to have a substantial role in the rent and aesthetic value.

4.1. Accessibility and Mobility: a case study

The present empirical investigation explores the importance of geographical characteristics in setting online pricing policy by hotels. To this aim, the analysis is run in the region of Sardinia (Italy; see also Biagi and Pulina, 2007; Pulina and Santoni, 2018). The data were extrapolated from the *Booking.com* website in 2017. The overall sample consists of 320 hotels located in five, of the eight, different provinces in the island, with the aim to elicit different levels of tourism specialization, hotel quality (expressed in terms of number of stars) as well as different levels of accessi-

bility and mobility within the region. According to the official statistics, in 2016 there were approximately 2,500 hotels in Sardinia (CRENOS, 2018). Hence, the extracted sample represents the population with a confidence interval of 5% and a confidence level of 95%.

Table 1 provides the main characteristics of the sample. The majority of the hotels, which advertise their business in *Booking.com*, are located in Olbia-Tempio (59.4%).

Table 1. Sample characteristics

	N	%
Province		
Olbia-Tempio (North)	190	59.4
Nuoro (Centre-East)	58	18.1
Ogliastra (East)	35	10.9
Carbonia-Iglesias (South-West)	29	9.1
Medio Campidano (West)	8	2.5
Stars		
1 star	2	0.7
2 stars	13	4.3
3 stars	164	54.3
4 stars	109	36.1
5 stars	14	4.6
Location		
Coastal hotels	273	85.3
Non-coastal hotels	47	14.7
Point of sale (Hotel)		
With	313	97.8
Without	7	2.2

This province is characterised by a high tourism specialization built since the ‘50s of the past century. Besides, the greatest quota of the sample consists of 3-star hotels (54.3%); this outcome is consistent with the most common types of hotels (CRENOS, 2018; see also Mantovani *et al.,* 2017), as driven by past policy issued by the Region (Pulina and Biagi, 2010). As expected, the majority of the hotels are located on the coast (85.3%) and have an own point-of-sale to facilitate transactions *in situ* (POS, 97.8%).

The aim is to explore whether there are statistically significant differences in hotel pricing policy with respect to their location, that is accessibility to the destination and mobility within the island, respectively. In this respect, hotel prices were collected discriminating between the low and the high season, as well as between a single and a double room. An independent sample test is run on the variance and on the mean. Moreover, a bootstrapping, with 1,000 replicas is also run to overcome small sample size issues, yet the findings have proved to be statistically consistent (full results can be provided upon request).

A first independent sample test is run to explore for statistical differences in terms of accessibility (Table 2). In this case, the grouping variable is the province: «Olbia-Tempio», which hosts a main national/international airport and port in the region, versus all «the other provinces» which do not host any main transportation hub.

Table 2. Independent sample test: accessibility to the province

		Levene's Test H_0*: equality of variances*		*t-test* H_0*: equality of means*		
		F	*Sig.*	*t*	*df*	*Sig. (2-tailed)*
Single_low season (means; high accessibility: 130 euros; low accessibility: 66)	Equal variances assumed	32,219	.000	5,979	303	.000
	Equal variances not assumed			7,355	225,209	.000
Single_high _season (means; high accessibility: 257 euros; low accessibility: 96)	Equal variances assumed	27,050	.000	5,683	303	.000
	Equal variances not assumed			7,139	198,888	.000
Double_low season (means; high accessibility: 142 euros; low accessibility: 80)	Equal variances assumed	37,917	.000	5,839	303	.000
	Equal variances not assumed			7,174	226,615	.000
Double_high season (means; high accessibility: 271 euros; low accessibility: 113)	Equal variances assumed	28,664	.000	5,622	303	.000
	Equal variances not assumed			7,069	197,561	.000

The null hypothesis of equality of variance and equality of means, respectively, can not be accepted in all the cases, at least at the 5% level of significance, implying that there are statistical differences in the pricing strategies adopted by «more accessible» and «less accessible» hotels. In greater details, price differences between a single room, in hotels with high accessibility versus hotels with a low accessibility, reach on average 97% during the low season, and 169% in the high season. For a double room, price differences reach on average 77% during the low season and 139% during the high season.

A second independent sample test is run to assess statistical differences in terms of mobility issues within the island, using as a grouping variable «coastal» versus «non-coastal» hotels (Table 3).

Table 3. Independent sample test: mobility within the region

	Levene's Test H_0*: equality of variances*			*t-test* H_0*: equality of means*		
	F		*Sig.*	*t*	*df*	*Sig. (2-tailed)*
Single_low season (means; coastal: 112 euros; non-coastal: 69)	Equal variances assumed	7,480	.007	2,673	303	.008
	Equal variances not assumed			5,174	182,327	.000
Single_high _season (means; coastal: 211 euros; non-coastal: 96)	Equal variances assumed	6,172	.014	2,758	303	.006
	Equal variances not assumed			6,017	273,335	.000
Double_low season (means; coastal: 123 euros; non-coastal: 88)	Equal variances assumed	8,437	.004	2,253	303	.025
	Equal variances not assumed			4,347	180,192	.000
Double_high season (means; coastal: 226 euros; non-coastal: 113)	Equal variances assumed	7,380	.007	2,748	303	.006
	Equal variances not assumed			6,204	294,549	.000

Also in this case, the null hypothesis of equality of variance and equality of means, respectively, can not be accepted in all the cases, at least at the 5% level of significance, implying that there are remarkable differences in the pricing strategies adopted by «coastal» and «non-coastal» hotels. In greater details, price differences between a single room, in coastal and non-coastal hotels, reach on average 61% during the low season, and 119% in the high season. For a double room, price differences reach on average 40% during the low season and 100% during the high season.

5. Conclusions

This paper has provided a literature review on hotel online pricing policy, covering three main perspectives: demand, supply and regional characteristics.

From a demand perspective, an in-depth and updated literature review has shown that online reviews, published by customers and viewers, play a significant role within the tourism activity and, especially, on the hotel sector. More and more, hotels rely on e-WOM because this marketing channel affects room revenue and business profitability. E-WOM is also a significant information source for hoteliers to understand customers' needs. Hence, online reputation plays an increasing role in price decision-making and hospitality operators should adjust prices in accordance to customers' evaluations (Abrate and Viglia, 2016).

On the supply side, research has proved to be still scarce and mostly underpinned to the standard competition framework, as also remarked by Van der Rest *et al.* (2018). The literature review has revealed that hotel pricing strategy would need more innovation able to detect changes within a rather volatile online market. An innovative

pricing system would be based not only on the value perceived by customers, but it would also require a remarkable investment in human skills, able to face the dynamic technical challenges. In this respect, many authors emphasise that hotels would benefit from a revenue management system that, although thought to be costly, especially for medium-low quality hotels, could be implemented by a workforce with higher digital skills, or even within OTA platforms which are having an increasing role both as a marketing channel as well as an important pricing making player (see Melis and Piga, 2017). Besides, through OTA, consumers can not only book their holidays, but also publish their reviews about their direct and indirect experience.

As a final step of the present research, a statistical analysis has been run to test in what measure geographical characteristics, such as accessibility and mobility, play a relevant role in hotel pricing strategies. The region of Sardinia (Italy) has been used as a case study and data, on a sample of representative hotels, were retrieved from Booking.com. These data elicited location heterogeneity and hotel quality and characteristics. The results have indicated the relevant role played by accessibility and mobility in the remarkable price differences, both in terms of products (single versus double rooms) and seasonality (low versus high season). Hence, these empirical findings have generalized further previous research and, especially, the work by Latinopoulos (2018) in terms of sea front rents, and by Yang *et al.* (2018a) in terms of accessibility.

Overall, the literature review has provided a better understanding on the online hotel activity. Amongst possible threads of investigation, future research would further investigate issues such as the impact of technical advances, competition, seasonality, taxation and regulation, impact of events, geographical characteristics, that can shade light on pricing policy adopted within the online hospitality sector.

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Appendix A

Table 1.A. Literature review (2017-2018)

Authors	*Journal*	*Aims*
Hu and Kim (2018)	*International Journal of Hospitality Management*	The study examined the effects of eWOM motivations on customers' eWOM behavior in the hotel setting.
Yang, Y., Park, S., Hu, X. (2018b)	*Tourism management*	The study synthesizes existing empirical results about the relationship between electronic word of mouth (eWOM) and hotel performance via meta-analysis.
Yen, C., Tang, C. (2019)	*International Journal of Hospitality Management*	The authors investigated the salient predictors for each individual eWOM behavior with an emphasis on hotel attribute performance.
Latinopoulos, D. (2018)	*Tourism management*	To test whether rooms with a sea view are priced higher than others, thus trying to quantify the associated aesthetic values of coastal areas where tourism-related development is a key economic activity.
Van der Rest, J. P., Roper, A., Wang, X. L. (2018)	*International Journal of Hospitality Management*	To analyze the process of changing a competition-oriented room rate pricing approach into a company wide value-based pricing process from the perspective of the resource-based view.
Phillips, P., Barnes, S., Zigan, K., Schegg, R. (2017)	*Journal of Travel research*	To investigate the valence of online reviews and modeling hotel attributes and performance.
Lin, C. A., Xu, X. (2017)	*Internet research*	To show that review rating, reviewer ethnicity and social distance have a significant effect on perceived reviewer trustworthiness, and only review valence has an influence on brand attitude and purchase intention toward a product evaluated by online consumer reviewers.
M. N., Gallego, P. A. M., and Benito (2017)	*International Journal of Hospitality Management*	To understand the determinants of consumers' willingness to pay.
Xie, K. L., Kwok, L. (2017)	*International Journal of Hospitality Management*	The study examined the relationship between the price positioning of Airbnb listings, measured in price difference between a hotel property and the nearby Airbnb listings as well as price dispersion among these Airbnb listings, and the performance of nearby hotels.
Raguseo, E., Neirotti, P., Paolucci, E. (2017)	*Information & Management*	To verify and discuss how OTAs and TripAdvisor can generate and capture value in the vertical chain of the travel industry.

Authors	*Journal*	*Aims*
Zervas, G., Proserpio, D., Byers, J. W. (2017)	*Journal of Marketing Research*	The authors explore the economic impact of the sharing economy on incumbent firms by studying the case of Airbnb, a prominent platform for short-term accommodations.
Xiang, Z., Du, Q., Ma, Y., Fan, W. (2017)	*Tourism management*	The study comparatively examines three major online review platforms, namely TripAdvisor, Expedia, and Yelp.
Yang, Z., Xia, L., Cheng, Z. (2017)	*Journal of Hospitality and Tourism Management*	The paper provides a conceptual understanding of the influence of regional factors on hotel development.
Rodríguez, A. A., Ballestero, P. T. (2017)	*Journal of Hospitality and Tourism Management*	The paper aims at assessing the level of application of Revenue Management in five-star hotels in Barcelona.
Melis, G., Piga, C. A. (2017)	*International Journal of Hospitality Management*	The article investigates whether the presence of dynamic pricing provides a realistic description of hotels' online pricing behavior.
Ivanov, S., Ayas, C. (2017)	*Tourism management perspectives*	This exploratory research paper investigates the revenue management practices of accommodation establishments in Turkey through a survey of 105 managers.
Guizzardi, A., Stacchini, A., Ranieri, E. (2017)	*Current Issues in Tourism*	To analyse price trajectories, finding dynamic pricing strategies

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Section ARTICLES

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Exploring the use of artificial intelligence in price maximisation in the tourism sector: its application in the case of Airbnb in the Valencian Community

Luis Moreno-Izquierdo *, Galina Egorova *, Alexandre Peretó-Rovira *, Adrián Más-Ferrando *

ABSTRACT: The use of machine learning is becoming more and more frequent in companies' search for competitiveness. Literature on the subject show us how in many cases artificial intelligence can help companies to improve their knowledge about users, optimize prices or guide buyers in their choices.
To confirm that the application of artificial intelligence models allows companies to obtain specifically better price optimisation procedures than with other traditional models, we have studied more than 10,000 Airbnb properties in the three main cities in the Valencian Community (Valencia, Alicante and Castellón), noting that the estimation process using neural networks offers significantly more satisfactory results than the use of hedonic models.

JEL Classification: O32; L83; R1.

Keywords: Machine Learning; Airbnb; tourism; hedonic prices; Valencian Region.

Explorando el uso de la inteligencia artificial en la maximización de precios para el sector turístico: su aplicación en el caso de Airbnb en la Comunidad Valenciana

RESUMEN: El empleo del aprendizaje automático es cada vez más frecuente para explicar la competitividad de las empresas. La literatura nos muestra cómo la inteligencia artificial puede ayudar a empresas a mejorar su conocimiento de los usuarios, optimizar los precios o guiar a los compradores en su proceso de elección.
Para confirmar que aplicando modelos de inteligencia artificial se permite obtener específicamente mejores procedimientos de optimización de precios respecto a otros modelos tradicionales, se estudian más 10.000 propiedades de Airbnb en las tres capitales de la Comunidad Valenciana (Valencia, Alicante y Castellón), observando que los resultados obtenidos con el modelo de redes neuronales artificiales son significativamente más satisfactorios que con el empleo de modelos hedónicos.

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Clasificación JEL: O32; L83; R1.

Palabras clave: aprendizaje automático; Airbnb; turismo; precios hedónicos; región valenciana.

1. Artificial intelligence as a way of maximizing profits and prices in the tourism sector

Autonomous and dynamic pricing in digital markets is a practice that started gaining in popularity more than a decade ago, thanks to the huge volume of past and real-time data available to many companies (Kutschinski *et al.*, 2003). Until relatively recently, as Lawrence (2003) points out, sellers could barely use their experience or intuition to price goods and services with a view to maximising results. E-commerce and increased access to data, however, has made it possible to establish an infrastructure for sellers with the potential for generating dynamic prices based on three key elements: time (temporary dynamic pricing), buyers (price differentiation) or bundling with other products or services (product differentiation).

The air transport market is a good example to look at when trying to understand this development: from an ocean of data and its management through artificial intelligence, a host of price maximization and differentiation processes can be carried out. According to Piga and Filippi (2002), Mantin and Koo (2010), Malighetti *et al.* (2010), Bachis and Piga (2011) and Moreno-Izquierdo *et al.* (2015), when dealing with the same product (seats on a flight), airlines use algorithms in which, as well as taking costs into account, they optimize the dates, the moment of purchase, the volume of sales made to date, or even specific interest in a certain destination.

This same strategy can be seen in other sectors, and not just those related to tourism, as companies are increasingly able to collect, manage and analyse data, presenting models and tools for optimising and maximising performance per user that are increasingly precise, as pointed out by Webb *et al.* (2001) or Albretch *et al.* (2007). The use of machine learning has been well studied for years; for example, in recommendations to users on goods or services in which they have shown interest (Jennings and Higuchi, 1993; Billsus and Pazzani, 1999); Alspector *et al.*, 1997), e-mail forwarding (Macskassy *et al.*, 1999), modification of means of communicating with web users (Litman and Pan, 2000) or the establishment of chatbots to speed up and improve responses to customers (Shawar and Atwell, 2007). This scientific research, however, cannot always be put into practice in companies. Although increasingly accurate artificial intelligence predictive models are being tested, according to Lang (1995) not all of these applications are profitable, since the extra profit that can be obtained from greater predictive capacity does not always exceed the investment necessary.

In the case of the tourism sector, as pointed out by Yu and Schwartz (2006) and Claveria and Torra (2015), there has been intense development in research techniques

and a growing interest in artificial intelligence over the last decade in response to issues with profitability and sustainability. Ye *et al.* (2009) used comments left by tourists on websites (blogs, forums, wikis...) to conduct a sentiment analysis on seven destinations: New York, Los Angeles, Las Vegas, London, Rome, Paris and Venice. Chen and Wang (2007) and Clavería *et al.* (2016) analysed different models to contrast the predicted volume of tourist arrivals to help policymakers propose strategies and decisions to gain a competitive edge in China and Spain respectively. Meanwhile, Akın (2015) used data on the volume of tourists arriving in Turkey to try to create models for demand through different machine learning models, seeking to achieve greater profitability per foreign tourist for a country that is increasingly dependent on international arrivals. Another noteworthy example is the article by Yang *et al.* (2015), who used different machine learning algorithms to predict the success of hotel locations in the city of Beijing, identifying potentially profitable areas for the construction of new hotels based on information from existing hotels, businesses in the area, traffic density or the existence of metro stations, among other variables.

This evolution shows that, while we are talking about a relatively young field of research, Jordan and Mitchell (2007) acknowledge that it is expanding fast, and the practical applications often exceed expectations. There are, however, still many new challenges to be overcome, in particular those related to the way in which the machines themselves learn, their interaction in complex systems of various devices and within their own architecture, or the processing of public and private user data.

So how does this apply to the case at hand? At Airbnb, artificial intelligence and machine learning are essential in order to explain the development of its business model. Chang (2017), in an article published on the Airbnb website itself, details how Airbnb's algorithms have been built to determine the rental price of real estate on any given date. Approximately 150 variables are analysed, including the location (country, market, neighbourhood), the average price on each date (price of stay, extra cleaning costs), availability of the properties, or their quality (number of reviews, user ratings), among a multitude of others. In addition, in all the information that Airbnb manages, Natural Language Processing (NLP) is being used to decipher the guest comments, host descriptions, and interaction between users, as described in Laurent *et al.* (2015), in order to obtain more information with a view to optimising the platform.

Equally, Ifrach (2015) points out how Airbnb uses machine learning to detect owner preferences, not just those of tenants or users of the service. According to Webb, Pazzani and Billsus (2001), observation of user behaviour patterns can provide useful examples for training artificial intelligence systems and thus create models for predicting future user behaviour. In this case, at Airbnb we find two different types of customers (tourists and owners), with patterns that are in many cases polar opposites, which adds complexity to the task of designing algorithms. That being said, machine learning has helped to significantly improve *matches* between hosts and guests using recommendations based on the behaviour of both hosts and guests, revealing preferences that went beyond having the properties occupied for a maximum amount of time.

Following the same line, Rystad, V. *et al.* (2017) remind us how the use of machine learning allows us to improve the value proposition for customers, using Airbnb as an example of the different objectives pursued through the creation of artificial intelligence algorithms. Specifically, for the improvement of peer-2-peer interaction, customisation of user experience, co-creation of content by hosts and guests, search engine optimisation, trust between users and simplification of processes.

Having arrived at this point and with real big data and artificial intelligence applications that seem to be effective in cases such as these, different authors have begun to make comparisons between econometric and machine learning models to determine which of them have greater predictive capacity. In our case, and in addition to the previous articles such as Selim (2011), Limsombunchai *et al.* (2004) or Peterson and Flanagan (2009) that we will cite below, we will compare the results obtained through a hedonic price model with those of an artificial neural network model for a base of more than 11,000 homes offered on Airbnb in three Spanish Mediterranean destinations: Alicante, Valencia and Castellón. In determining the model, more than twenty variables have been taken into account, which include both elements specific to the property and others from the social, economic and touristic environment of the destinations studied. In order to do this, a methodological comparison will then be made and the data will be analysed on the basis of both models. The results show, as expected, that the neural network model is more robust.

2. Hedonic Price Models and Artificial Neural Networks

2.1. Hedonic prices

When determining a property's value, whether it be for rent or sale, the hedonic pricing model has been one of the most widely used methods for decades, with the understanding that pricing is based on a range of components that contribute a certain value to the final good (Rigall-I-Torrent, R. *et al.*, 2011). At first glance, it is impossible to determine all the attributes that make up a product, since not only physical or measurable factors must be taken into account, but also psychological or temporal ones, for example. The methodology of hedonic prices allows us to estimate the value contributed by each of the attributes (physical or otherwise) to a property, and to make predictions about the behaviour of the rest of the properties when any of these elements vary.

The methodology of hedonic prices is particularly useful for measuring the impact of specific elements on the value of goods or services through a multiple regression analysis. In this way, the function of the price (P) that picks up each one of the characteristics or elements can be expressed as:

$$P_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + ... + \beta_j X_{ji} + e_i,$$

where P_i is the price of good *i*, and each of the βX_i the characteristics defined with their corresponding regression coefficients. Finally, as is obvious, «*e*» represents the margin of error.

This method has been used to determine the value of price components since the 1930s, and in the case of the tourism sector it has been used to determine the price of hotel rooms (Espinet *et al.*, 2003; Rigall-i-Torrent *et al.*, 2011), private rental properties in holiday areas (Hamilton, 2007; Portolan, 2013), or Bed and Breakfasts (Monty and Skidmore, 2003), among others.

In recent years, it has also notably been applied to estimate the value of different attributes in price composition on the Airbnb platform, by experts like Dogru and Beijing (2017), Gibbs *et al.* (2018), Chen and Xie (2017) or Wang and Nicolau (2017), who mainly study attributes of homes such as parking facilities, washing machines, dishwashers,... but also include variables related to social reputation; others, like Ert *et al.* (2016) and Teubner *et al.* (2017), focus on issues such as the photographs that owners upload to the platform, their star rating or owner response. These studies show how the sharing of information by potential customers, in addition to direct interaction between owners and guests —without intermediation— constitute what was a non-existent value-add in the tourism sector prior to its digitalization.

2.2. Artificial Neural Networks

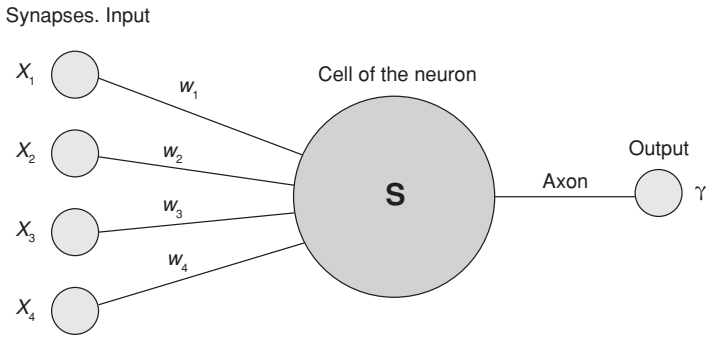
The Artificial Neural Networks (ANNs) model, on the other hand, was born as part of research in the field of artificial intelligence, which was trying to model the structure of the human brain and reproduce biological nervous systems' capacity to study and correct errors. In a manner of speaking, AANs is an artificial intelligence model designed to replicate the processes of the human learning brain, generalise results and respond in the most rational way possible in cases of absence or ignorance of data (Shaw, 1992).

Neural networks make it possible to create and recognize patterns and provide the capacity to process information that incorporates random components, with the possibility of implementation in traditional statistical techniques (Otero and Trujillo, 1993). This is because distributions generated by non-linear and non-Gaussian processes are more robust, based on less strict forms of distribution and have the capacity to adapt or learn in changing environments (Lippman, 1987).

Put simply, we can represent neurons as systems formed by a branched information input structure (dendrites), the nucleus and the branch output (axon), as can be seen in Figure 1. In the structure of the brain, the axons of some neurons are connected to the dendrites of others through synapses, one neuron being activated to another from certain volumes and intensities of emitted-received signals (activation threshold). This construction founded on a large number of simple elements allows our brain to solve extremely complex problems, since each of the neurons takes a

weighted sum of input signals, and in the event that the total input exceeds a certain level, it transmits the signal to new neurons.

Figure 1. Functioning of a neuron

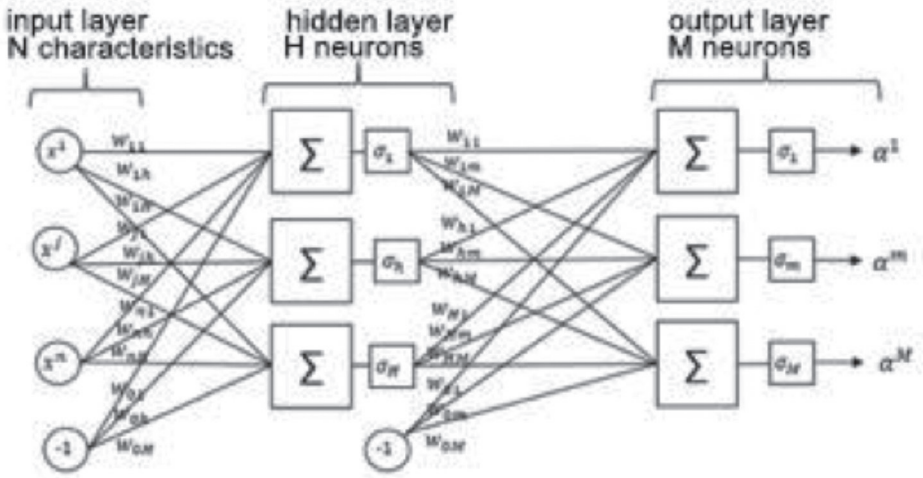


The most common neural network model, reflected in James and Carol (2000) (Figure 2), has three main components and three layers: the input data layer, the hidden layers -with the weighted summation functions and transformation function, and the output layer. These processes have a large number of interconnections between the nodes that form the layers. Through the information network, the first layer of nodes is the one that receives the data input, transferring it to all the nodes that make it up and once this information is collected by each one, it is adapted and transformed by means of a predefined function. This transformation will be the output transferred to the next layer, in turn becoming the input received by all the nodes in the second layer through all the interconnections, until it reaches the last layer, where each element receives information from the elements of the previous layers and provides an output in a non-linear process.

So, neural networks are universal function approximators, a concept used by Hornik, Stinchcombe, and White (1989), and their predictive capacity increases with the number of layers and the number of neurons in them, although generally two or three layers would be sufficient to solve the vast majority of the practical tasks of classification, regression and prediction. With this, authors such as Otero and Trujillo (1991) were able to demonstrate that neural networks can compete without significant disadvantages with the best traditional statistical model when it comes to generating multi-period predictions.

Unlike the hedonic pricing model, ANN methodology allows non-linear relationships between variables to be found and therefore can potentially provide better predictive capacity than multivariate analysis, according to Wilson *et al.* (2002). Other authors, such as Claveria and Torra (2014) showed that they have a great capacity for prediction, but that the ARIMA models surpassed them in predicting tourist demand, although they do admit that the results of neural networks can be improved through structure optimization and the incorporation of additional memory values.

Figure 2. Functional structure of the neural network model



The aim of this study is to compare the two models in order to determine which of them is the most robust in terms of predicting the value of rental properties on the Airbnb platform. This comparison exercise has already been carried out by some previous authors, such as Selim (2011) in the Turkish market for the value of properties in 2004, in which he compared the prediction results obtained between the hedonic regression and the artificial network models and demonstrated the potential of the latter to be a better alternative than the former in predicting the price of housing. A similar result was reached in the study for 200 properties in New Zealand carried out by Limsombunchai *et al.* (2004), in which the effect of factors such as the size of the property, the number of bedrooms or its location, among others, was again analysed by hedonic regression and neural networks. Peterson and Flanagan (2009) once more emphasized that artificial neural networks generated fewer errors in predicting home value prices for a sample of more than 45,000 homes in North Carolina. However, it has not been applied to date in a comparison between tourist rental properties, as is the case with Airbnb.

3. Data used for the study and results of the models

The goal of this study is to estimate rental value on Airbnb through a series of defined attributes about the apartment itself, as related to the city in which the property is located. The sample includes the apartments offered on Airbnb in the three provincial capitals of the Valencian Community (Alicante, Valencia and Castellón) during the months of May 2016 to May 2017. Valencian Community is one of the most important tourist sun-and-beach destinations in Europe, receiving more than nine million tourists per year. However, the three capitals of the region combine sun-and-beach conditions with a complete service supply (such as universities or public

and private hospitals), and highly-rated cultural activities, historic monuments and famous restaurants. That implies relevant differences in the Airbnb composition with respect to those destinations completely dependent on sun-and-beach tourism: The three capitals cities have a lower seasonality of the tourism demand, and a less ratio of second homes than the average of the Region of Valencia (36%).

In all the three cities studied (specially in Alicante and Valencia) there have been a great increase of properties published in Airbnb since 2014, combining both full apartments and rooms (full and shared). However, there is a big number of these properties that have been never rented. This is a normal situation in collaborative economy markets where there is an oversupply of goods (apartmets) and full information.

Because of that, of all the homes that were offered May 2016 to May 2017 in the Valencian Community, only those that were rented for at least one day were taken into consideration, leaving out those that were inactive on Airbnb. Our dependent variable will therefore be the average rental price, taking into account only those properties that were rented for at least a day within the period being referred to.

In short, with regard to the estimation of the models, 8,096 properties in the city of Valencia, 2,988 properties in the city of Alicante and 299 properties in Castellón have been taken into consideration, each displaying significant differences. In the city of Castellón, for example, single or shared room rentals predominate over complete properties (56% compared to 44%), while in Valencia, complete properties account for 60% of the supply and in Alicante they account for 70%.

Although these total numbers may seem very high, we must remember that the collaborative economy is based on a basic assumption of «excess supply» (Moreno-Izquierdo *et al.*, 2015) and in this case it can be clearly observed by looking at the occupancy rate. In the case of Castellón, the average occupancy rate of the properties is 40%, and 30% in the case of single and shared rooms. In the case of Alicante, we see a 43% occupancy rate for the complete apartments, and 35% for the rooms. And as for Valencia, there is an occupancy rate of 48% in the case of complete buildings, and 40% in the case of room rental.

According to the data obtained from AirDNA, as well as from the statistical databases of the National Statistics Institute of Spain and the *Generalitat Valenciana*, the following variables for the study of pricing in the apartments offered on Airbnb in the three capital cities referred to (Table 1) were defined:

Table 1. Variables used for the exercise

Variable	*Meaning*	*Source*	*Mean*	*SD*
Properties	Number of properties belonging to the owner	AirDNA	7.413	18.011
Superhost	If the owner has a good reputation on Airbnb	AirDNA	0.102	0.303

Variable	*Meaning*	*Source*	*Mean*	*SD*
Population	Inhabitants in the area of the study	INE	653,316.96	216,257.03
GDPpc	GDP per capita in the study destination	GVA	14,258.17	572.87
Sec/Main	Volume of secondary properties in relation to the total number of properties	GVA	9,997	3,221
Hot/Pop	Volume of hotel beds in relation to the total population	GVA	2.029	0.107
Apt/Pop	Volume of non-hotel beds in relation to total population	GVA	0.030	0.006
Entire home	(dichotomous)	AirDNA	0.632	0.480
Private room	(dichotomous	AirDNA	0.367	0.479
Shared room	(dichotomous)	AirDNA	0.006	0.077
Bedrooms	Number of bedrooms	AirDNA	1.756	1.043
Bathrooms	Number of bathrooms	AirDNA	1.337	0.561
MinStay	Minimum authorised stay	AirDNA	4.119	119.63
BusReady	Advertised for companies	AirDNA	0.064	0.245
N.Reviews	Number of reviews left on Airbnb	AirDNA	14.125	25.800
Overall Rate	Guest ratings	AirDNA	4.520	0.555
OccRate	Occupancy rate for the property	AirDNA	0.441	0.257
T.Rented	Times the property or room has been rented	AirDNA	14.856	18.642
CancelStrict	Strict cancellation policy	AirDNA	0.355	0.478
CancelModerate	Moderate cancellation policy	AirDNA	0.294	0.455
CancelFlexible	Flexible cancellation policy	AirDNA	0.342	0.475
CancelSuperStrict	Extremely strict cancellation policy	AirDNA	0.001	0.037
N.Photos	Number of photos the owner has put on Airbnb	AirDNA	18.361	12.876

3.1. Comparing of obtained results

Once the theoretical basis of both models has been introduced, in this case study, to work the models correctly, we proceeded to divide the sample randomly: 70% of the observations are aimed at the training stage of the models, while the remaining 30% is used to test the quality of the results.

After determining the variables that form part of the estimate, two regressions of hedonic models are performed through the Ordinary Least Squares method, in the

first case with Classical Standard Errors, and in the second with robust errors consistent with Heterocedasticity. The model therefore looks like this:

$$P_i = \beta_0 + \beta_1 Properties + \beta_2 Superhost + \beta_3 Population + \beta_4 GDPpc + \\ + \beta_5 Sec/Main + \beta_6 Hot/Pop + \beta_7 Apt/Pop + \beta_8 Entire\ home + \beta_9 Private\ room + \\ + \beta_{10} Bedrooms + \beta_{11} Bathrooms + \beta_{12} MinStay + \beta_{13} BusReady + \beta_{14} N.Reviews + \\ + \beta_{15} Overall\ Rate + \beta_{16} OccRate + \beta_{17} T.Rented + \beta_{18} CancelStrict + \\ + \beta_{19} CancelModerate + \beta_{20} CancelFlexible + \beta_{21} N.Photos + e_i$$

with 21 variables that bring together different facts about the properties of the apartment, but also about the cities used for the study.

The results obtained by hedonic regression are shown in Table 2, with two different models depending on the robustness of the errors. Three of the five variables related to the city structure are omitted from the results of the two estimated models because of their relationship with the variable «per capita income». This indicates that the structure of tourism supply in these cities is, in turn, closely linked to the average income of their inhabitants. It is worth indicating that in subsequent tests carried out, as the number of cities in the model increased, these variables did reflect results in the model.

Table 2. Hedonic price estimation results

Variable	*Model 1:Classical Standard Errors*	*Model 2: Heterocedasticity HC1 consistent errors*
Properties	.4355309***	.4355309***
Superhost	.5838822	.5838822
Population	2.42e-06	2.42e-06
GDPpc	.0008722	.0008722
Sec/Main	(omitted)	(omitted)
Hot/Pop	(omitted)	(omitted)
Apt/Pop	(omitted)	(omitted)
Entire home	55.4549***	55.4549***
Private room	16.16067***	16.16067***
Bedrooms	11.21321***	11.21321***
Bathrooms	25.80606 ***	25.80606 ***
MinStay	–.0017646***	–.0017646***
BusReady	2.04221	2.04221
N.Reviews	–.0459272**	–.0459272**

Variable	*Model 1:Classical Standard Errors*	*Model 2: Heterocedasticity HC1 consistent errors*
Overall Rate	5.15262***	5.15262***
OccRate	–32.8399***	–32.8399***
T.Rented	–.0075623	–.0075623
CancelStrict	12.01599*	12.01599*
CancelModerate	8.743345	8.743345
CancelFlexible	8.336936	8.336936
N.Photos	.4763268***	.4763268***
N: *Adj R-squared* *F-Test*	8877 0.4957 485.65***	8877 0.4967 482.57***

*** = 99% significance (p-value less than 0.001).
** = significance at 95% (p-value less than 0.05).
* = significance at 90% (p-value less than 0.1).

The model presented shows good accuracy, with most of the variables selected displaying a 99% significance, especially those related to the properties of the rental homes. Likewise, the F-Fisher test also performed at a confidence level of 99%. While it is true that the value of R2 is equal to 0.4967, a value below what has been obtained in articles made in similar years, this is due to the lack of significance or omission of the values of the variables that situate the context of the properties. In the case of the purchase or rental value of properties, their location or context has a high degree of explanation, and for reasons already explained our hedonic model is unable to reflect, based on the variables chosen, this relationship.

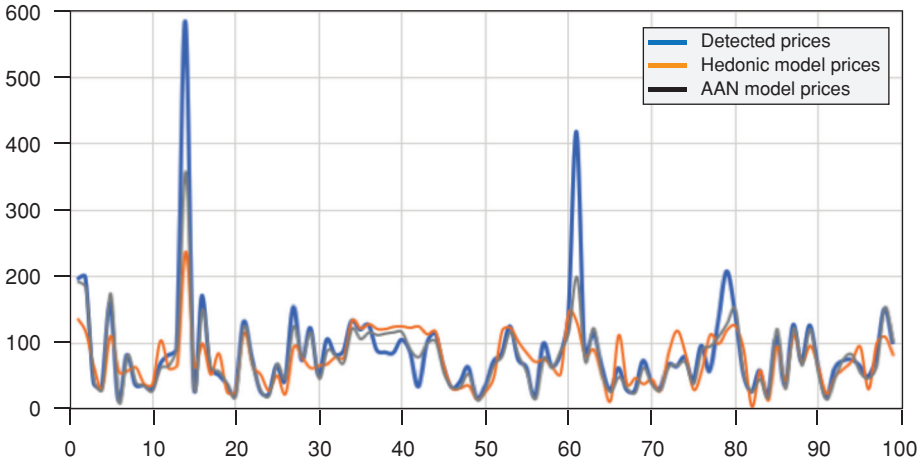
This difference in accuracy can be seen in Graph 1, where the price taken as a dependent variable is compared with the estimate under the model with robust errors. Taking 100 random values from the sample for a clear representation, we can see how there are certain properties in which the real price is much higher than the estimate, indicating this lack of explanation in the variables used in the model. In the same graph, we can also observe how the estimate made using the neural network model has better accuracy with respect to the prices used as our dependent variable.

In the process of developing our artificial neural network, a network of three layers is selected with activation functions in the neurons in sigmoid or logistic type hidden layers. This kind of neural network usually gives the best results in these types of exercises according to the literature mentioned in this article. To find the Airbnb rental price, the same set of variables that define our hedonic model are taken as inputs, and this set of data is used to train our model.

In the regularization algorithm, two phases of iterations were established for the elimination of variables with excessively small coefficients within minimums. This

method involves smoothing out and eliminating variables with large regularization parameters and free construction of the model with small values. Models with small regularization parameters can be useful if we assume that the variables remaining after elimination are significant for constructing the model.

Graph 1. Comparison of real prices and estimated prices for 100 homes



Previously, we set the work areas of the neurons, which positively affects the obtaining of a more efficient model, since it does not allow the work areas to leave the data area, keeping all neurons operating.

As a result of all of the above, the neural network estimation process was found to be far more satisfactory than using the two observed hedonic models, with an accuracy of 87% versus the 46% obtained with the hedonic regression model. In addition, there was also a decrease in the mean square error, dropping to less than 2,700 with the neural network model, confirming that the application of machine learning models allows companies such as Airbnb to obtain better price optimisation procedures than with other traditional systems.

4. Conclusions

Machine learning models are making great strides in many scientific fields, but they are also making a difference on a business level. Strategies related to communication and marketing, with new gamma systems, the interpretation of user reactions or optimized pricing models, are today considered unthinkable by many companies if not coupled with artificial intelligence and big data models.

In the case of tourism, the emergence of Airbnb in recent years has provided a further example of how machine learning can optimise performance. Unlike air transport, where only one provider (the airline) acts on the basis of its demand in-

formation, Airbnb must manage millions of owners and practically the same number of tourists. In other words, they must make it their mission to optimise two key elements: price according to the qualities of the product, and utility of demand in providing the best option to the user.

Airbnb employees themselves acknowledge in various articles published on their website that without machine learning models it would be impossible to maximise performance, and this article, to some degree, gives visibility to that statement. For the data chosen —Airbnb apartments in three Spanish tourist destinations— there can be no doubt that neural networks work better than traditional regression models. This result makes us think first and foremost about relationships between variables that are not only linear, and secondly, about the greater predictability of machine learning models, which only increases with continued use, the amount of data available and the number of variables.

Unfortunately, today it is not so simple for all tourism companies to boast this type of mechanism to optimize their performance: it requires vast quantities of data and processing, as well as experts in data analysis. The tourism sector in sun-and-beach destinations

In addition, two important issues in the practical application of artificial neural networks are still the interpretability of results and the stability of the model, although the solution to these problems may be to strengthen the model by including Boosting and/or Naive Bayesian Classifier algorithms in the assembly.

In short, in the example used for apartment rental on Airbnb, neural networks have led to a considerable improvement in prediction compared to the hedonic price model. On a business level, this can mean a significant competitive advantage, provided that the benefits of its application outweigh the costs of its development.

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Section ARTICLES

Journal of Regional Research Investigaciones Regionales

Smart tourism experiences: conceptualisation, key dimensions and research agenda

Francisco Femenia-Serra *, Barbara Neuhofer **

ABSTRACT: «Smart tourism» has gained momentum in research fostered by the revolution of the latest generation of information and communication technologies and has rapidly become a leading stream of literature. The concept has permeated governments and the business sphere and has been accompanied by the quest for developing smart devices, services and tourist destinations. However, experiences as the main focus of smartness development in tourism and destinations have received comparably little attention in *the smart discourse.* Smart destinations, as new ecosystems backed by concrete geographical contexts, facilitate the co-creation of a rich, technology-based, smart tourism experience (STE). Yet, a clear definition and examination of the dimensions of what constitutes a smart tourism experience is still to be developed. This paper aims to discuss the main core precedent constructs of STEs, namely: *a)* technology enhanced experiences and *b)* smart destinations, to underpin a holistic definition of a smart tourism experience. Based on an in-depth literature review, a novel conceptual model for this concept is developed and an agenda for further research is proposed drawing on the identified key themes and dimensions of this construct. By mapping out smart tourism experiences and providing real examples, this research contributes to the theoretical foundations of smart tourism and tourist experiences.

JEL Classification: L83; O32; R1.

Keywords: smart tourism experience; tourist experience; smart tourism; smart destination; co-creation; research agenda; smart tourism destination.

Smart tourism experiences: conceptualización, aspectos clave y agenda de investigación

RESUMEN: El llamado «turismo inteligente» ha ganado relevancia impulsado por la revolución que han supuesto la última generación de tecnologías de la información y la comunicación, convirtiéndose rápidamente en una destacada co-

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rriente de investigación. El concepto ha permeado gobiernos y ámbito empresarial y su consolidación ha ido acompañada del desarrollo de dispositivos, servicios e incluso destinos turísticos inteligentes. No obstante, *la experiencia turística,* como mayor preocupación y motor de desarrollo del turismo inteligente, ha recibido relativamente escasa atención en el discurso *smart*. Dentro del mismo, los destinos turísticos inteligentes son entendidos como un nuevo ecosistema, basado en un espacio geográfico determinado, que facilita la co-creación de experiencias turísticas inteligentes. A pesar de ello, no existe hasta el momento una definición clara de lo que supone una experiencia inteligente, ni tampoco de sus dimensiones. Partiendo de esta realidad, el presente trabajo tiene como objetivo llevar a cabo una discusión sobre los constructos teóricos precedentes de la experiencia turística inteligente (*smart tourism experience*), a saber: *a)* las experiencias mejoradas tecnológicamente, y *b)* los destinos inteligentes, con el fin de desarrollar una conceptualización holística de la misma. Asimismo, se propone un modelo conceptual para la experiencia inteligente y una agenda de investigación futura. A través de la nueva conceptualización ofrecida y la ejemplificación de la misma a través de casos reales, el presente trabajo contribuye a los fundamentos teóricos del turismo inteligente y de las experiencias turísticas.

Clasificación JEL: L83; O32; R1.

Palabras clave: experiencia turística inteligente; experiencia turística; turismo inteligente; destino inteligente; co-creación; agenda de investigación; destino turístico inteligente.

1. Introduction

In the past few years, a novel and global stream of research has emerged under the umbrella of the popularised «smart» tag, applied not only to technological artefacts and buildings (Snoonian, 2003), but also to cities (Caragliu, Del Bo and Nijkamp, 2011; Chourabi *et al.,* 2012; Komninos, Pallot and Schaffers, 2013) and increasingly to tourism (Gretzel, Werthner, Koo and Lamsfus, 2015). In general, the notion of smartness advocates the application of technological advances and automation to increase efficiency, save costs and offer more sustainable and enjoyable solutions. In tourism, the application of smartness principles is primarily aimed at enhancing the tourist experience through state-of-the-art technologies and big data exploitation in order to facilitate stakeholder value co-creation across the smart service ecosystem (Gretzel, Sigala, Xiang and Koo, 2015; Xiang and Fesenmaier, 2017). Smart tourism propositions to date have generated great expectations (Gretzel, Werthner *et al.,* 2015) and have found its most fruitful application in the discourse surrounding smart destinations (Buhalis and Amaranggana, 2014; Lamsfus, Martín, Alzua-Sorzabal and Torres-Manzanera, 2015), and new realities and business landscapes still under construction (da Costa Liberato, Alén-González and de Azevedo Liberato, 2018). However, despite the recent attention that the smart tourism literature has received, the impact of information and communication technologies (ICTs) is not new or unacknowledged in the field. ICTs have completely disrupted the tourism system (Ip, Leung and Law, 2011),

from businesses operations to customers behaviours, and also destinations as the main encounter space. This revolution together with an accelerated globalisation movement, has resulted in a compression of time and space and a de-differentiation of social spectrums (Cohen and Cohen, 2012). As a result of ICTs integration, the barriers between life and travel, home and away, work and leisure, and daily life and tourist experiences have been blurred (Uriely, 2005). However, the era of smartness goes one step further in the recognition of the impact of ICTs in tourism.

In this context, two elements have gained particular attention in recent years within tourism and ICTs research: smart tourism destinations and tourist experiences. On one side, while the notion of «e-destination» is still valid (Buhalis, 2003), the debate goes beyond the implementation of ICTs within destinations towards a «smart destination» that encapsulates a holistic shift of destinations for becoming fully immersed in the current technological change (Boes, Buhalis and Inversini, 2015; Buhalis and Amaranggana, 2014; Jovicic, 2017). In terms of experiences, major changes can be observed due to the proliferation of ICTs. Experiences have been mediated, extended and enhanced due to ICTs and their influence on the entire customer journey (Neuhofer, Buhalis and Ladkin, 2012; Tussyadiah and Fesenmaier, 2009). This change means that the rapid adoption of certain technologies has shifted from the usual study of the business-centred transformative power of technology, to a more user-centred approach.

Nonetheless, the discussion of smart destinations on one side and experiences on the other side, have followed to some extent separate paths in research. Most studies to date in the stream of smart tourism have focused on the necessary theoretical development (*e. g.,* Boes *et al.,* 2015; Buhalis and Amaranggana, 2014; Femenia-Serra, Neuhofer and Ivars-Baidal, 2019; Gretzel, Sigala, *et al.* 2015; Gretzel, Werthner *et al.,* 2015; Jovicic, 2017; Lamsfus *et al.,* 2015; Li, Hu, Huang and Duan, 2016), single or multiple smart destinations case studies (Boes, Buhalis and Inversini, 2016; da Costa Liberato *et al.,* 2018; Del Vecchio and Passiante, 2017; Khan, Woo, Nam and Chathoth, 2017; Micera, Presenza, Splendiani and Del Chiappa, 2013), or concrete technological applications in the smart context (Park, Lee, Yoo and Nam, 2016; Sedarati and Baktash, 2017). However, the tourist experience, despite being a core construct of smart tourism and destinations, has been partly overlooked in applied works with some exceptions (Buonincontri and Micera, 2016; Femenia-Serra, Perles-Ribes and Ivars-Baidal, 2018). It is based on this rationale that this paper seeks to explore the smart tourism experience (STE) concept in more depth to facilitate future empirical contributions. There is a need to better delineate the real scope of the STE and to delve into aspects on how a smart tourism experience is co-created and what kind of environment is needed for such an experience to emerge. Departing from the above-mentioned gaps in literature, the aim of this paper is to outline the main themes and current research on tourist experiences in smart contexts and to propose future directions of inquiry in this field. This is done by bridging the literature around technology-mediated tourist experiences and smart destinations. This paper contributes to literature in that it offers a holistic definition for STEs, a conceptual model and sets out to offer directions for further research.

The paper is structured as follows. First, we offer a synthesis of the main theoretical themes which are currently being addressed by academia in the two main theoretical streams that underpin the STE, namely: *a)* tourist experiences and ICTs, and *b)* smart destinations. Following this, a definition of the smart tourism experience and its dimensions is proposed and captured in a conceptual model. Finally, a research agenda is provided based on the detected research gaps and some examples of real best practices in the facilitation of STEs are offered, together with the final conclusions.

2. Tourist experiences and ICTs: state of the art

2.1. The tourist experience, under constant evolution

The «tourist» and the «tourist experience» are core constructs in tourism research and occupy a central position since the 1960s, with the advent of the first studies devoted to the nature of experiences in a broad-brush and critical fashion (Boorstin, 1964), evolving progressively towards more complex interpretations (MacCannell, 1976; Turner and Ash, 1975). Cohen's phenomenology of tourist experiences (1979) marked a turning point for acknowledging diversity within experiences, and his following work deepened our understanding of motivations, attitudes and behaviours of tourists (Cohen, 1984, 1988) consolidating the sociological foundations of tourists and their experiences. In the 1990s, the subjectivity of experiences and their sensorial dimensions appear gradually within postmodern research, while the differentiation between routine, work-driven everyday life and leisure time starts to blur and positivistic approaches seem insufficient to capture individual experiences (Ryan, 2000; Uriely, 2005; Urry, 1992; Urry and Larsen, 2011).

The need to provide tourists with unique experiences was further acknowledged with Pine and Gilmore's (1999) «experience economy» concept, which posits that companies need to stop simply delivering goods and services, to start engaging customers in a more personal way staging unique, memorable experiences. These experiences are not unidirectional, but rather co-created between the company and the consumer. As Prahalad and Ramaswamy (2004a) argue, consumers realise they want to interact with companies and co-create value, breaking the company-centred traditional market and opening a new era of interaction in which all stakeholders are empowered thanks to the possibilities ICTs offer (Neuhofer, Buhalis and Ladkin, 2012). This way, the co-creation of experiences represents a highly relevant concept for tourism and experience research (Prahalad and Ramaswamy, 2004b; Binkhorst and Dekker, 2009).

The constant quest for these experiences has given rise to a new «creative tourist class» for which the pursuit of experiences and the creation of value and meaning through them is a vital part of living and travelling (Gretzel and Jamal, 2009). Still, while a great amount of intellectual efforts have been put in the experience concept itself during the last years (Quan and Wang, 2004; McCabe, 2005; Mossberg, 2007;

Prebensen and Foss, 2011; Tussyadiah, 2014; Uriely, 2005; Volo, 2009; Walls, Okumus, Wang and Kwun, 2011) there exist a wide range of different conceptualisations around tourist experiences. As argued by Uriely (2005), «the tourist experience is currently depicted as an obscure and diverse phenomenon, which is mostly constituted by the individual consumer» (p. 209). Further definitions emphasise the subjective and plural nature of experiences. Tung and Ritchie (2011, p. 1369) for instance, define it as «an individual's subjective evaluation and undergoing (*i. e.,* affective, cognitive, and behavioural) of events related to his/her tourist activities which begins before (*i. e.,* planning and preparation), during (*i. e.,* at the destination), and after the trip (*i. e.,* recollection)». In line with this, Walls *et al.* (2011) conceptualise the tourist experience as depending on a combination of internal and external factors, such as the individual characteristics, situational factors, physical elements and the human interaction ones. In a similar fashion, Tussyadiah and Zach (2012) deconstruct tourist experiences in four general dimensions: 1) sensory and physical, 2) affective, 3) cognitive and perceptual and 4) social, and one particular for their study context (*en-route*). This way, experiences are multidimensional, involving tourists «emotionally, physically, intellectually and spiritually» (Mossberg, 2007, p. 61). These complementary dimensions of experiences are fussed, interpreted, and maybe translated into durable memories by individuals (Volo, 2009).

2.2. ICTs mediating experiences

Tourists have become «prosumers» and have now technological tools to construct and reconstruct socially their experiences (Gretzel and Jamal, 2009). This has forced businesses, but also destinations, to adapt to a new era of tourist experiences. ICTs have «mediated» the tourist experience in the sense that they have transformed how we interpret the places we visit and socially construct our experience in its three phases (before, during and after the trip) (Tussyadiah and Fesenmaier, 2009; Wang, Park and Fesenmaier, 2012). Some particular ICTs have had a decisive role in mediating experiences, as they have been widely adopted by users, companies and destinations. Social media is one of many examples. They actively support the sharing of personal experiences with others through comments, pictures and videos and other user-generated content (UGC) (Xiang and Gretzel, 2010). Users share their experiences in these media in order to help potential consumers and relatives, or keep tight and endurable social connections, among other motivations (Munar and Jacobsen, 2014). A second major driver of change in this scope has been mobile technology. Smartphones have greatly mediated tourism experiences due to their manifold functions that have allowed tourists to feel better connected, informed and to have more fun while getting higher value (Wang, Xiang and Fesenmaier, 2014). Supported on these devices, augmented reality applications (Yovcheva, Buhalis and Gatzidis, 2013) and mobile apps (Wang *et al.,* 2012) can enhance tourist experiences as well.

But apart from mediating experiences, ICTs have allowed co-creating experiences between tourists, businesses and destinations. The role of technology for co-

creation has been progressively acknowledged as an underlying mechanism for the creation of enriched experiences for travellers (Binkhorst and Dekker, 2009; Prahalad and Ramaswamy, 2004b; Prebensen and Foss, 2011; Sfandla and Björk, 2013) only recent contributions have examined the role of technology on the co-creation of tourism experiences (Gretzel and Jamal, 2009; Neuhofer *et al.,* 2012), and emphasised its relevance within the smart tourism discourse (Del Vecchio, 2017; Femenia-Serra, Neuhofer and Ivars-Baidal, 2019; Gretzel, Sigala *et al.,* 2015; Wang, Li and Li, 2013).

Thus, two aspects stand as critical in research on tourist experiences and ICTs: the technological mediation of experiences, and the co-creation of experiences through technologies. The fusion of both streams has given rise to the «technology enhanced experience», a novel theoretical approach which has been lately combined in research with the advent of the cutting-edge smart technologies and their implications over experience.

2.3. Technology enhanced experiences and the advent of smart technologies

Technology enhanced experiences play a particularly important role as one of the building stones of smart tourism. Neuhofer *et al.* (2012) explored technology mediation in the destination context and shaped the notion of technology enhanced destination experiences. They argue that through the integration of ICTs and co-creation, experiences do not only happen in the physical domain on site, but in online virtual spaces at the same time. For destinations this means that a network of actors become interconnected in the destination ecosystem to facilitate and co-create experiences around a particular tourism destination (Neuhofer *et al.,* 2012). In order to co-create more personalised experiences for and with tourists, Neuhofer *et al.* (2015) define requirements of smart technologies for experience creation. First, ICTs need to allow for information aggregation, meaning that they need to have the capacity to collect and store information about tourists in a central platform. Second, the authors point out the need for ubiquitous mobile connectedness, suggesting that experience creators and stakeholders need to be connected in a system to facilitate personalised experiences, dynamically «on the move». The third requirement regards real-time synchronisation, which builds on connectedness and the ability of the ICTs infrastructure to transmit and exchange information in real time to facilitate experiences that meet the tourists' needs in the right context at the right time (Neuhofer *et al.,* 2015).

Technology enhanced experiences are inherently linked to the destination as a physical co-creation space (Neuhofer *et al.,* 2012). However, since the advent of the concept, and because of the rapid emergence of new technologies, perspectives around destinations have evolved and encapsulated in the novel smart destination approach (Jovicic, 2017). Besides, while some technological antecedents and requirements around personalised and co-created experiences have

been defined (*e. g.,* Neuhofer *et al.,* 2015), it appears that the diversity of smart technologies applicable to experiences in the smart tourism phenomenon is still to be defined on a more granular level. The smart tourism phenomenon brings new perspectives on technology-mediated experiences to the surface that are yet to be addressed.

3. Smart destinations: a new context for experiences

3.1. Smart destinations: New local and technological ecosystems

Smart destinations have been characterised by scholars in many different ways. It is generally agreed that they find their roots in the smart city concept foundations. A smart city is defined by Caragliu *et al.* (2011) as the city in which the «investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance» (p. 50). Gretzel and Sigala *et al.* (2015) consider that smart destinations apply these principles not only for residents but also for tourists, and highlight the embedment of a technological infrastructure into the physical space of destinations. In a similar vein, the Spanish innovation fostering agency Segittur argues that smart destinations employ state-of-the-art technology to improve their performance in sustainability, innovation and accessibility (Segittur, 2015). These holistic perspectives, while needed, risk being utilised as rhetorical discourse rather than a real and applicable approach. Nevertheless, smart destinations differential factor and value proposition is an intensive use of latest ICTs to improve tourist experiences and destination competitiveness (Buhalis and Amaranggana, 2014). Other definitions of smart destinations emphasise different aspects, such as innovation, knowledge transfer and mobility in these contexts. Still, the technological component is always present as a key feature of the smart destinations. In these spaces, ICTs become transversal and are present in all the elements, in addition to facilitating the dynamic interaction among the different stakeholders (Gretzel, Werthner *et al.,* 2015). A core trait of a smart destination is the use of ICTs to facilitate tourism-related data interchange among the destination stakeholders, in which DMOs are expected to play a critical role (Jovicic, 2017). ICT-based dynamic connection of all stakeholders (Ivars-Baidal, Celdrán-Bernabeu, Mazón and Perles-Ivars, 2017) and intelligent decision making derived from an advanced use of big data (Del Vecchio, 2017; Xiang and Fesenmaier, 2017) constitute key principles of smart destinations.

However, smart destinations are lately going beyond mere theoretical proposals and are progressively acknowledged as a valid destination management approach in many destinations, which are actively applying smart principles in their management (Femenia-Serra, 2018). This is the case in many Spanish cities, where policies are encouraging the creation of big data platforms and the active interchange of ideas through the implementation of the first smart destinations network.

3.2. Tourist experiences centrality and technological solutions in smart destinations

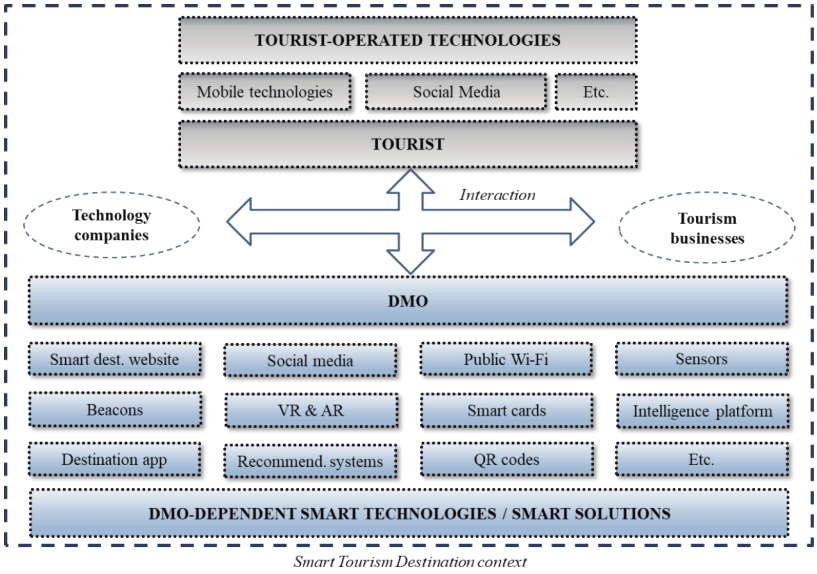
A major objective of smart destinations is enhancing tourist experiences through higher personalisation of services and products (Buhalis and Amaranggana, 2015) and a dynamic joint value co-creation (Boes *et al.,* 2015). This aim is fulfilled by a combined use of technologies and the integration of tourism big data from different sources into one central, real-time platform that allows for better decision making and enhanced experiences (Buhalis and Amaranggana, 2014; Xiang and Fesenmaier, 2017). To personalise experiences, getting as much information as possible about travellers is a crucial step. This means that quantifying tourists' feelings and behaviours (*i. e.,* comments on online communities, spatial movement, expenses, activity on social media) will provide valuable insights about their preferences and needs and will open opportunities to tailor services in a real-time and context-aware fashion (Choe and Fesenmaier, 2017).

Being a heavily public-driven approach (Ivars-Baidal *et al.,* 2017), within the smart destination development it is not only businesses that are called to deliver unique experiences through ICTs, but also destination management organisations (DMOs) (Femenia-Serra *et al.,* 2018). These organisations are challenged to plan and implement technological solutions, which benefit both the own destination from a public perspective, and the tourists visiting it. As argued by Ivars-Baidal *et al.* (2017), DMOs can employ several «smart solutions» in order to enhance tourist experiences, and better market and manage the destination. This indirectly implies and benefits the other two main stakeholders to consider: tourism and technological businesses. Figure 1 reflects this spirit and enlightens how DMOs may employ public-driven smart solutions and combine them with widely adopted technologies by users in the smart destination context. Both types of technologies interact dynamically and entangle indirectly technological companies providing infrastructures, and tourism businesses.

As depicted in Figure 1, and following Femenia-Serra *et al.* (2018) and Ivars-Baidal *et al.* (2017), the typology of technologies available to be used in a smart destination varies from the previously mentioned social media and smartphones and other mobile technologies, which are rather dependent on the user to be activated, to those which depend on the infrastructure provided by the DMO. These are referred to in literature as *smart solutions*, and encompass more established technologies (*e. g.,* public Wi-Fi, destination official website or mobile apps) to more contemporary ones (*e. g.,* virtual and augmented reality tools, sensors, beacons). Their potential to be used at smart destinations for enhancing tourist experiences has been emphasised by several scholars (Femenia-Serra, Neuhofer *et al.,* 2019; Huang, Goo, Nam and Yoo, 2017; Koo, Yoo, Lee and Zanker, 2016). Through this typology of ICTs, tourists and DMOs interact in the smart destination and actively create the bonds for further experience co-creation entangling technological and tourism-related businesses. However, the interaction between tourists and DMOs through technologies is just one

of the steps in the construction of an anticipated holistic smart tourism experience. Therefore, at this point this paper seeks to take the discussion one step beyond the above-described technology enhanced experiences to conceptualise the smart tourism experience and to explore its main dimensions as well as the main topics to address in forthcoming research.

Figure 1. Smart destinations: Technology typology and interaction



Source: own elaboration based on Femenia-Serra *et al.* (2018) and Ivars-Baidal *et al.* (2017).

4. The smart tourism experience

Together with the review of the relevant literature around its main precedent constructs, an in-depth search was performed in SCOPUS database to look for specific uses of the smart tourism experience (STE) notion by using the keywords «smart touris* experience»; «smart tourism» and «smart experience». A total of 221 documents were found and manually examined to check its content and potential interest for the formulated objectives. After this initial screening, a total of 89 documents were taken as related to the field and some of them considered in the above-provided literature review. From these, around one third were found actually meaningful for defining the concept and taken into account for the following conceptualisation. Three preliminary conclusions were reached from analysis: First, scientific papers employing the concept are rare and recent (*e. g.,* Basili, Liguori and Palumbo, 2014; Chung, Tyan and Han, 2017; Gretzel, Reino, Kopera and Koo, 2015; Gretzel, Sigala *et al.,* 2015; Jovicic, 2017) which is understandable because of its novelty. Second, in some cases the above-mentioned keywords are used be-

cause the inquiry is related to concrete (smart) technological applications with some implications for users' experiences (*e. g.,* Basili *et al.,* 2014; Chung *et al.,* 2017). Third, it appears that contributions have offered limited insights or have used the concept briefly in the wider context of smart tourism or smart destinations. In these latter cases, we find some interesting recent perspectives around STEs. Jovicic (2017, p. 3) for instance argues that «the smart experience component implies technology-mediated experiences of tourists, who not only consume, but also create data that can improve the quality of experiences (*e. g.,* by uploading photos on electronic social media, related to a certain destination)». Similarly, Del Vecchio (2017) considers STEs a result of the development of smart tourism and states that big data is key for building them together with context-awareness and real-time personalisation. Deepening on this idea, Gretzel, Sigala *et al.* (2015) identify smart tourism experiences as one of the three components of smart tourism and referring to the previous work of Buhalis and Amaranggana (2015) and Hunter, Chung, Gretzel and Koo (2015), argue that efficiency and rich meaning are core traits of the STE. For them, tourists need to be co-creators of this experience, using technologies (*e. g.,* smartphones) to become an active part of their development. Similarly, Gretzel, Reino, Kopera and Koo (2015) emphasise the centrality of STEs in smart tourism ecosystem as a shared goal. According to these authors, these experiences are reached through a deep awareness of the tourists' context, a high personalisation, real-time monitoring and an appropriate utilisation of smart technologies. The combination of these elements will lead to the emergence of valuable recommendations for tourists co-created experiences, which are further socially shared (Gretzel, Reino *et al.,* 2015; Neuhofer *et al.,* 2015).

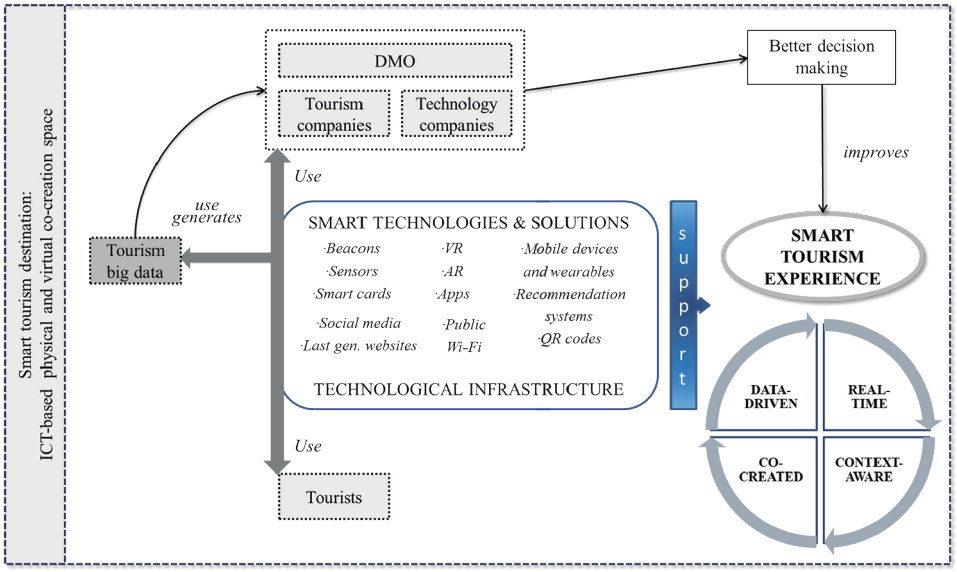
Drawing on these contributions, this paper now further elaborates on the STE and proposes a holistic conceptualisation based on its main characteristics or dimensions. This conceptualisation does intend to be definitive or exhaustive but shall rather serve as a basis for further exploration of the smart tourism experience concept, from a theoretical and practical point of view.

4.1. Conceptualisation of smart tourism experiences

The proposed conceptual model for STEs (Figure 2) offers a global vision of smart tourism experiences and their creation within the context of smart destinations. As mentioned, this conceptualisation further elaborates on previous contributions to come to a better understanding deepen in the different layers of STEs.

Four main dimensions build up STEs and are derived from the technological infrastructure and a close interaction between tourists and the rest of stakeholders at smart destinations. As follows, an exploration of these dimensions of STEs is performed. STEs are:

Figure 2. The smart tourism experience: dimensions and creation in the smart destination context



Source: own elaboration.

4.1.1. Data-driven

Learning about tourists and their behaviour is now more possible than ever before for destinations thanks to the existing information sources and data analysis techniques available to them (Fuchs, Höpken and Lexhagen, 2014). This way, tourism big data can serve as source of intelligence for destinations management and decision-making, for instance in their marketing and policy-implementation actions (Marine-Roig and Anton Clavé, 2015), with a clear impact on travellers' experiences.

Big data is «the blood» of smart tourism (Gretzel, Sigala *et al.,* 2015) and it constitutes the foundation on which the construction of value is based. Therefore, data creation, storing, processing and utilisation emerge as the key steps for STEs construction. In the last years, the introduction of many cutting-edge technologies (*i. e.,* smart technologies and solutions) has fostered an even more user-centric creation of data (*e. g.,* sensors, smartwatches and other mobile devices, use of cloud services...) and has allowed to quantify almost any parameter, opening the possibility to trace tourists' digital footprints in their multiple forms (Choe and Fesenmaier, 2017). DMOs but also businesses in the sphere of smart destinations can use tourists' data to create more personalised experiences thanks to the discovery of patterns, sentiment analysis, prediction of needs and behaviours and construct on these bet-

ter services and products (Del Vecchio, 2017). The personalisation of experiences, as a driving force for smart destinations development (Buhalis and Amaranggana, 2015), is greatly based on the availability and ability to work with data. This constitutes a challenge but also an opportunity to create experiences driven by data at an individual level. STEs are then built up in the collective big data but also in the own individuals' data.

4.1.2. Built in real time

Apart from being data-driven, experiences in smart destinations are constructed in a real-time way thanks to the dynamic interconnection the latest ICTs allow, and the easiness to gain knowledge on tourists' needs and wishes immediately (Wang, Li, Zhen and Zhang, 2016). Interaction «on-the-go', but also marketing based on specific needs of tourists depending on their timing, are great opportunities for smarter experiences in scopes such as gastronomy, transport or hospitality (Buhalis and Amaranggana, 2015). Real-time synchronisation is critical within businesses and in the B2C (*business to consumer*) interaction, and it is precisely the introduction of smart technologies which allows to perform it in a more extensive way (Neuhofer *et al.,* 2015). Thanks to availability of data, now businesses in the tourism sector and also publicly-managed attractions can offer updated information to tourists, such as real waiting times. In the smart destination not only businesses are expected to deliver this real-time experience, but also DMOs enter the experience arena with the application of their smart technologies. The employment of a shared technological platform or intelligence dashboard for decision making by DMOs is much based on the idea of real-time actions for enhancing travellers' experiences (Buhalis and Amaranggana, 2014). Theoretically, this central data centre would be automatically fed by different destination stakeholders: administration-DMO, hoteliers, restaurants, transport companies, museums and other cultural attractions, entertainment and recreation sector, banks, technology companies, etc., and could be the base for making decisions «on-the-go» for issues like tourist flows management, emergencies and maintenance, access to monuments or protected areas as well as to elaborate predictions. This dynamism in decision making is also emphasised by Buonincontri and Micera (2016) when arguing that technologies in the SD support the tourist-suppliers interaction, sharing and active participation. But interaction can even go in this smart context to the tourist-machine level with the development of artificial intelligence and its application in virtual assistants and chatbots, or even robot concierges, who can all provide real-time interaction for a smarter experience. For tourists themselves, having updated information can be critical in some specific situations, such as when navigating the destination, looking for specific information or planning their activities. Thus, real-time use in this context will help to deliver the relevant information to the right person for the right experience.

4.1.3. Based on context-awareness

Understanding tourists' context is critical for delivering the right information and service. However, each tourist and each environment are different. According to Lamsfus, Wang, Alzua-Sorzabal and Xiang (2015), context in tourism is defined by two domains. First, «personal and trip characteristics» entail all individual characteristics (*i. e.,* personality, sociodemographics, values...) and also trip characteristics (*i. e.,* purpose, length, mobility...). Second, the «environment domain» entangles aspects like location or weather but also in the context of travel it includes social factors and different cognitions, or feelings derived from the external context. Depending on the combination of both domains, tourists' needs, particularly of information, will be different and will dynamically evolve as travellers encounter different physical places and social interactions.

Mobile technologies have spurred the development of context-aware systems, and their coupling has been proved to play a critical role in the smart destination, in which relevant information might be facilitated to tourists depending on their location by a given stakeholder (Lamsfus, Martín *et al.,* 2015). In line with this, the progressive development of the Internet of Things (IoT) together with the unstoppable expansion of wireless connectivity at destinations and the use of sensors will create the ubiquitous connectedness that context-aware information systems need to deliver their full potential to experience enhancement (Gretzel, Sigala *et al.,* 2015). Social media have also become a strong pillar in the construction of a smarter experience together with smartphones (Buhalis and Foerste, 2015). The combination of both facilitates more personalised and really context-aware experiences in the sense that the overwhelming information available to all users can be seized down to the individual level. This way, in the smart destination thanks to the ubiquitous connectedness, mobile devices and use of social media it is more possible than ever to advance towards more context-aware experiences.

4.1.4. Co-created

As it can be observed in Figure 2, interaction among stakeholders is basic in the smart destination setting and articulated through a technological infrastructure composed by smart technologies and solutions. Still, technology employment is not enough for developing a full STE. Rather, this technology has to be used to perform a dynamic co-creation of the experience for delivering actual value to all the destination stakeholders (Neuhofer *et al.,* 2012). In the SD, the DMO takes a pro-active role together with businesses and applies the public-owned smart solutions for engaging tourists in a superior level. This way, the data-driven, real-time and context-aware experience is furthermore co-created by the different stakeholders in the SD, including the co-creation between: service provider-tourist, tourist-tourist, DMO-tourist, DMO-service providers (Wang *et al.,* 2013). Thus, value co-creation in the smart

destination is closely linked to the complex ecosystem of stakeholders involved in it (Boes *et al.,* 2016) and the increasingly blurred roles of each of them in the ecosystem (Gretzel, Werthner *et al.,* 2015). In line with this, to take co-creation to a new level, data must be shared, and information silos broken down. Collaboration rather than competition needs to be the philosophy in the smart context depicted in Figure 2.

On another side, while the alliance between cutting-edge technologies and co-creation for better experiences has been proved successful in the domain of hospitality (Neuhofer *et al.,* 2015) destinations are much more complex environments. However, some initial findings from real destinations already suggest that the use of technologies for fostering co-creation in smart destinations has a positive impact on experiences (Buonincontri and Micera, 2016; da Costa Liberato *et al.,* 2018). Additionally, regardless of the specific context, it also seems that younger tourists are particularly predisposed to use certain technologies to further co-create their experience in the context of smart destinations (Femenia-Serra, Perles-Ribes *et al.,* 2018). This could mean a new generation of tourists, prone to use technologies in a higher extend for their experiences, and who will be more open to co-create in all the phases of their trips.

In a nutshell, the STE is a multi-layered type of experience, achievable in ICT-based ecosystems with a dynamic interaction among all stakeholders and with a clear innovative spirit. It is a co-created, data-driven experience constructed on context-aware and real-time way. However, in the current context most destinations do not meet the required infrastructure for this STE to happen. Rather, we find traces of this type of experience and its dimensions in different tourism sectors and destinations where the smart principles are taking form. It is also true that an increasing number of companies and DMOs are evolving towards smarter experience co-creation by innovating in their processes and contact with users. Next, drawing on the dimensions of STEs and the detected research gaps, a research agenda is set and several potential research lines discussed.

5. Research agenda

As follows, this paper sets straightforward research directions for possible future investigations. Considering that research on smart tourism experiences is still at an early stage, this agenda must be taken as an open framework to work on ideas and propositions for advancing in the knowledge of tourist experiences in smart contexts.

In table 1, four main research areas or broad topics to be explored in relation to the STE dimensions, plus one considered as «cross-cutting», are proposed.

Table 1. Smart Tourism Experiences: Research agenda

STEs dimension *General topics*	*Emerging specific research topics*
Data centrality	— Property and access to data (governance). — Capacity of data exploitation and human resources. — Real value of data. — Privacy concerns. — Public-private partnerships in destinations. — Dependence on data providers.
Real-time development	— Stakeholders' action capacity. — Connectivity limitations. — Dependence on mobile technologies. — Response time.
Context-awareness	— Availability of data and access. — Context knowledge and particular conditions. — Diversity of contexts, needs and preferences. — Usefulness/Value of available data. — Privacy concerns.
Co-creation	— Businesses awareness and readiness. — Human resources formation. — Tourists' willingness. — Design of innovative experiences. — Access to smart technologies.
Cross-cutting issues	— Psychological effects of STEs. — Rapid technological evolution: obsolescence and adaptation capacity. — Actual enjoyment assessment. — Digital gaps: young vs. senior tourists; developed countries vs. developing countries. — Implications for environment. — Policies implementation. — Funding of smart solutions.

Many of the proposed research lines to be further explored entangle some of the main challenges and barriers, but also intricate matters that smart tourism experiences conceptualisation has brought to light. Elaborating on the four main identified dimensions of STEs, some common research gaps are found. One of them is the complex interrelationship between private and public entities in the smart destination. In such a changing ecosystem and with roles evolving rapidly in line with technology progress, the specific responsibilities, financial sources and monetarisation options need to be closely considered (Gretzel, Werthner *et al.,* 2015). Related to data centrality and real-time monitoring, privacy emerges as a major challenge for smart destinations, still to be faced. Some evidences already point out to the limited wish of tourists to share part of their private data in exchange of personalised experiences, even among younger generations (Femenia-Serra, Perles-Ribes *et al.,* 2018). Data governance is therefore a major debate point. Moreover, the overload of information and

possible harmful effects of a super-connected tourist experience need to be further examined, as well as the different technology gaps existing between different groups of people, but also in different geographic spaces. Connectivity is not for the moment ubiquitous in every single destination, even though future development of 5G and more wireless networks will help to face this issue. Related to context-awareness and the possibility to implement different smart solutions, it will be interesting to see how different destinations, with their own idiosyncrasy, particular physical configuration and resources, adapt to the smartness era (Ivars-Baidal *et al.,* 2017). In line with this, applicability of smart destinations philosophy in rural, cultural destinations and in developing countries is also a pending issue for research.

6. Implications and conclusions

The above-provided conceptual framework has captured an undergoing shift in experiences and also aims to facilitate to tourism organisations the adoption of actions to cope with and deliver full STEs. Destinations and companies need to embrace this emergent type of experiences and apply the right practices in their marketing and management strategies to do so. To better illustrate this conceptualisation and how STEs are currently being constructed across different tourism industries, now this paper concludes with a couple of real cases which constitute interesting examples of how STEs can be facilitated. These two examples illustrate the implications for companies, but also DMOs, and can provide lessons for them in their facilitation of better experiences by using the right technologies.

One remarkable example of a data-driven, context-aware and real-time experience is offered by technology company *Touring Plans*©. By employing their own patented data processing system, this company offers mobile apps (named *Lines*) for some of the American most popular theme parks aimed at reducing the amount of time spent by users in lines. The apps calculate in real time the expected waiting time in each line for each attraction thanks to their complex algorithm which considers parameters as diverse as unemployment and inflation rates, vacation timing from school systems or price index in different countries. Furthermore, the apps gather back data from real users' waiting times in lines and this way enriches its prediction capacity with historical data from thousands of park-goers. The apps update the information every few minutes, calculate walking times to attractions and design personalised plans for visiting the parks while displaying user-friendly interfaces. This way, the smart experience lived by tourists using Touring Plans apps is built on data and features real-time information for users, making their experience more enjoyable and saving up as much as 4 hours per day in lines (Brown, 2012; Wisel, 2017).

Another good example of how smart tourism experiences can be created also by DMOs is found at the Spanish destination of Palma de Mallorca. The destination smart office, in collaboration with private companies, has deployed in the last years Europe's biggest free Wi-Fi zone in the city main beach, but also historical city and port. Thousands of tourists have already used the network and the obtained data has

allowed the DMO to start using key insights for the destination management and for better tourist experiences, including the control of tourist flows over the most crowded spaces. Thanks to its Wi-Fi, Mallorca knows now demographic information (age, gender, nationality, language) and precise location of users depending on the connection points. This allows the destination a much more context-aware offering of information to tourists and a deeper engagement with them. This way, Mallorca utilises a contextual marketing strategy in its alliance with tourism businesses operating at the city. When using Wi-Fi, tourists accept to receive adverts from close businesses, getting relevant and context-aware information. Wi-Fi availability has also fostered the sharing of user-generated content on social media, facilitating the co-creation of experiences by using common hashtags (like *#VisitPalma*) (SmartOffice Palma, 2018). This results at the end in a co-created and context-aware smart tourism experience for Palma visitors.

These examples of the services provided by a company and a DMO demonstrate how these organisations have successfully released a smart tourism experience to tourists by employing adequately smart technologies and solutions to offer an experience which is data-driven, built in real time, context-aware and co-created. But most of all, these organisations have utilised technologies with the superior end of providing a better experience. This way, other businesses in any of tourism sectors and all DMOs ought to think of how they could improve the experiences they offer and then exploit the potential of using ICTs to facilitate these superior experiences while taking into account tourists' current needs and expectations. Agility in response, higher personalisation and contextualisation are key in smart destinations for the STE to happen. Developing innovative practices like the ones the examples demonstrate might help companies and DMOs to discover their improvement possibilities.

Again, caution must be taken when considering technology for facilitating experiences. Different types of barriers, technology gaps and sometimes the own tourists' willingness, difficult a full adoption of technologies (see Femenia-Serra, Neuhofer *et al.,* 2019). ICTs need to be understood as the means but not the end of the STE. Moreover, it is necessary to further investigate if STEs are actually more enjoyable than «regular experiences» from the very tourists' perspective and to better understand to what extend tourists' involvement is necessary for a full crystallisation of the smart destination paradigm. Research on experiences and tourists' participation in smart tourism requires more efforts (Femenia-Serra, Neuhofer *et al.,* 2019). Smartness is a novel paradigm that fosters a higher stakeholder interaction, acknowledges the increasing relevance of data or the implication of emerging technologies. Nevertheless, the objective has to remain the same regardless of the context: to create more enjoyable experiences.

In a nutshell, the creation, and even more the co-creation, of memorable and superior experiences has become a major *leitmotiv* in tourism and a market imperative for any organisation operating in the sector (Prebensen and Foss, 2011; Walls *et al.,* 2011). The irruption of ICTs has influenced this creation process by mediating experiences (Tussyadiah and Fesenmaier, 2009) but also by allowing to co-create

them in a more extensive degree (Neuhofer *et al.,* 2012). This way, experience design becomes increasingly important in the current context for all tourism organisations (Tussyadiah, 2014). These will need to better understand the kind of experience tourists expect from them and how they can facilitate it at an individual level. In this context, the irruption of the smart destination paradigm has changed the foundations of destinations functioning and has introduced a new philosophy around the role of DMOs in the creation of experiences, calling for a wider implication of these institutions and an advance interaction among all the stakeholders through ICTs (Buhalis and Amaranggana, 2014, 2015; Femenia-Serra, Neuhofer *et al.,* 2019; Gretzel, Werthner, *et al.,* 2015). In smart destinations the availability of smart solutions at the hand of DMOs (Ivars-Baidal *et al.,* 2017) or smart technologies for businesses and users (Neuhofer *et al.,* 2015), creates the perfect environment for the development of smart tourism experiences.

However, to date a clear conceptualisation of what a STE is, its dimensions and its construction was missing. To this end, the present paper has first elaborated on the main precedents of STEs by reviewing the main scientific contributions in the field. Following this, a conceptual model for STEs has been proposed (Figure 2) and the dimensions of smart experiences have been explored and defined. Next, a research agenda has been proposed based on the detected research gaps in the conceptualisation process. Five main research topics or themes have been identified in line with the STE dimensions. To finish, implications and main conclusions have been provided. To further strengthen the implications for companies and DMOs, a couple of examples of current best practices have been referred in this section. Although many barriers and challenges have been also identified and acknowledged here, the progress of technologies and the relevance of experiences in tourism will continue to grow in the following years. It is hoped that this theoretical exercise illuminates further research to better understand how experiences, smart technologies and destinations shape each other.

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Section ARTICLES

Journal of Regional Research Investigaciones Regionales

Smart sustainability: a new perspective in the sustainable tourism debate*

José Francisco Perles Ribes**, Josep Ivars Baidal**

ABSTRACT: This work tries to contribute to closing the existing gap in the relationship between sustainability and smartness, patent both in the field of research and in the management of cities and tourist destinations. The points in common between the concepts of sustainability and smartness applied to the management of tourist destinations are analyzed, as well as the critical factors that hinder its practical application, as a starting point to move towards a synergistic model for sustainable tourism destinations, called Smart Sustainability. This proposal is based on a true governance of the destination and is aimed at taking advantage of the opportunities offered by information and communication technologies (ICTs) for a more efficient and sustainable management.

JEL Classification: L83; R12; O33.

Keywords: sustainable tourism; Smart Tourism Destinations (STDs); Information and Communication Technologies (ICTs).

Sostenibilidad inteligente: una nueva perspectiva en el debate del turismo sostenible

RESUMEN: Este trabajo trata de contribuir a cerrar la brecha existente en la relación entre sostenibilidad e inteligencia, patente tanto en el ámbito de la investigación como en el de la gestión de ciudades y destinos turísticos. Se analizan los puntos en común entre los conceptos de sostenibilidad e inteligencia aplicados a la gestión de los destinos turísticos, así como los factores críticos que dificultan su aplicación práctica, como punto de partida para avanzar hacia un modelo sinérgico para los destinos turísticos sostenibles e inteligentes, denominado *Smart*

* This research has been carried out within the framework of the research Project: Analysis of planning processes applied to smart cities and tourist destinations. Balance and proposal of a new methodology: Smart Tourism Planning (CSO2017-82592-R) under the Spanish National R&D&I Plan financed by the Ministry of Economy and Competitiveness (2018-2020). The authors wish to thank the journal's referees for their insightful comments, which have improved the presentation of research substantially.

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Sustainability. Esta propuesta está basada en una verdadera gobernanza del destino y está orientada a aprovechar las oportunidades que ofrecen las tecnologías de la información y la comunicación (ICTs) para una gestión más eficiente y sostenible.

Clasificación JEL: L83; R12; O33.

Palabras clave: turismo sostenible; destinos turísticos inteligentes; tecnologías de la información y la comunicación.

1. Introduction

The debate surrounding sustainable tourism development, which became particularly intense after the Earth Summit of Rio de Janeiro (1992), has been largely rhetorical and has generated very few practical results (Garrod and Fyall, 1998; Vera, 2001; Robinson, 2004; Lansing and De Vries, 2007). The approaches taken by the research on sustainable tourism in its four dimensions (environmental, economic, social and cultural) are diverse, as are the scales of analysis. In any case, the imbalances generated by tourism development persist or have become worse. On a global scale, the expansion of tourism demand, which will reach 1.8 billion tourists in 2030 in terms of international movements, in addition to the domestic movements (between 10 and 12 billion trips) (UNWTO, 2017) is generating a considerable ecological footprint. Lenzen *et al.* (2018) find that, between 2009 and 2013, the global carbon footprint of tourism increased from 3.9 to 4.5 GtCO2e, four times more than previously estimated, accounting for about 8% of global greenhouse gas emissions. This figure must be contextualized within the real threat of climate change.

On a local level, irrespective of the different types of tourism spaces, the conventional planning schemes and supposedly alternative approaches have not ensured sustainability in development (Moscardo, 2012). This raises serious doubts about the renewal of processes that are generating major problems, such as overtourism (Postma and Schmücker, 2017), and calls for further-reaching solutions, including degrowth (Hall, 2014).

We can find a parallel of this approach focused on tourism in the growth of the world's population and its increasing concentration in urban environments, where 66% of the planet's inhabitants will live in 2050. This context poses new challenges for urban management, which are largely addressed from the smart city perspective, which is a clear predecessor of the smart tourism destination (STD). Generally speaking, the smart city concept encompasses the improvement of sustainability through greater efficiency obtained from the use of new technologies and a higher volume of information for management (Giffinger *et al.,* 2007; Komninos, 2015), generally within the new governance processes (Caragliu, Del Bo and Nijkamp, 2011). Similarly, sustainability constitutes an inseparable part of the smart tourist destination concept, at least from a theoretical point of view.

This article reviews the concepts of sustainability and smartness applied to tourist destinations. The objective is to identify common and complementary aspects so

as to explore the possibility of obtaining higher levels of sustainability based on the development of a smart tourist destination strategy along the lines put forward by Perles and Ramón (2017). The study is structured into three sections: an assessment of the real effect of applying the paradigm of sustainability to tourist destinations; an evaluation of the smart destination approach as a reference for re-thinking the sustainability of destinations; and an attempt to formulate a synergistic model for sustainable and smart destinations called smart sustainability. In this way, we seek to explore the relationship between the concepts of sustainability and smartness within tourism in greater depth. Ahvenniemi *et al.* (2018) point out that, in the case of smart cities, there is a large gap in this relationship which must be resolved so that progress can be made in the application of the sustainable and smart development approaches. Finally, in the debate about the sustainability of tourism, most studies have focused on theorising and policy formulation, while the benefits of technology for sustainable tourism have been researched less (Ali and Frew, 2013). This justifies the use of a new analytical perspective related to technology and its smart use in order to explore which new features have emerged in the long debate on tourism sustainability.

2. Do sustainable tourism destinations exist?

The concept of sustainable development, rooted in the environmental awareness of the 1970s, is associated to the impossibility of reaching unlimited growth in a world of limited resources. Defined by Brundtland (1987) as the «development that meets the needs of the present without compromising the ability of future generations to meet their own needs», it has been adapted to tourism, and sustainable tourism is understood as that which «meets the needs of present tourists and host regions while protecting and enhancing opportunity for the future. It is envisaged as leading to management of all resources in such a way that economic, social, and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity, and life support systems» (UNWTO, 1993). However, there is no generally accepted definition of sustainable tourism. In view of this lack of precision, the concept has often been relegated to a mere rhetorical use (Hughes, Weaver and Pforr, 2015; Gössling, Hall and Weaver, 2009). The breadth, complexity and evolution of the concept make it difficult to understand or hinder its practical management and cause possible confusion with other concepts such as resilience (Farrell and Twining-Ward, 2005; Lew, Ng, Ni and Wu, 2016).

Nevertheless, there is a basic series of generally accepted principles or objectives related to the sustainability of destinations based on the four dimensions of the concept, namely the environmental, social, cultural and economic dimensions (McKercher, 2003). Wight (2002) highlights the intrinsic value of the environment and the need for its long-term viability not to be compromised by a short-term view; tourism should be recognised as a positive activity which can benefit the community, the destinations and the visitors; the relationships between tourism and the environment should be managed in a way so that the former does not harm the lat-

ter, impair its future enjoyment or generate unacceptable impacts; tourism development should respect the size, nature and characteristics of the destination; it should establish a harmonious balance between the needs of the visitor, the place and the resident community; all of the agents involved should respect these principles —the tourism industry, governments, environmental agencies— and work together to achieve them.

The World Tourism Organisation has extended these principles to incorporate the guarantee of economic viability of destinations in the long term; the fostering of local prosperity, social equity and the generation of quality employment; a satisfactory experience for visitors without gender, racial or disability discrimination; the control and local planning of tourism processes; the maintenance of local well-being levels and the promotion of cultural wealth; the preservation of the physical integrity of landscapes and resources and the biological diversity; and the achievement of maximum efficiency in resource consumption and the minimisation of the impact of the tourism activity on the environment (UNWTO, 2013).

These principals are fulfilled through the implementation of measures structured around five basic pillars, namely: the governance and design of the tourism policy; economic performance and competitiveness; employment and human capital; a reduction in poverty; and the fostering of social inclusion and the natural and cultural sustainability of tourism development (UNWTO, 2013). Within this context, key roles are played by integrated planning (Wight, 2002); innovation —understood as responsible innovation—, proactive research and education (Hjalager, 1997; Wight, 2002; Blauwhof, 2012); the active involvement of residents and stakeholders in the whole process through cooperation and the creation of partnerships (Simpson, 2001; Wight, 2002) and a real long-term perspective which should avoid the simple linear cause-effect relationships and adopt new methods for resolving problems (Fodness, 2016). In parallel with the development of these general principles, initiatives aimed at measuring the sustainability of destinations have proliferated. Currently, there are many proposals of indicators (UNWTO, 2004; EC, 2016) and practical measurements related to all spheres —international, national, regional and local—. However, a definition of generally accepted indicators used in practice has not been reached (Önder, Wöber and Zekan, 2017).

In the distribution of roles for the promotion of a more sustainable tourism, the public sector would be responsible for managing environmental resources; integrating tourism in the planning and management of resources; advising tour operators; promoting the participation of citizens and stakeholders in decision-making; educating and disseminating information; establishing cooperative partnerships with communities and other administrations; or promoting research (Wight, 2002). Meanwhile, the corporate sphere is required to adopt an environmental approach in business through a leadership focused on quality; to identify sustainable tourism with a possible strategic market niche for certain demand segments; to incorporate sustainability as a transversal aspect of management; to prioritise products and destinations which have a sustainable orientation; and to implement actions to render demand behaviour more

sustainable and to promote the protection of spaces or the regeneration of run-down areas of interest for industry (Kirstges, 2002).

Despite this vast theoretical development, the practical application of sustainable development, and, by extension, sustainable tourism, has been strongly debated by authors such as Smith (2010) or Blauwhof (2012) who express their scepticism about the possibility of achieving true sustainable development without growth. The few empirical studies on the subject (O'Neill, 2015) point to an overall panorama of a preference for growth and the existence of very few economies operating within the framework of a sustainable or stationary state. In tourism, although sustainability may constitute a diversification strategy which is profitable for companies (Bagur, Martí and Rocafort, 2014), we can observe that it is very difficult to transfer the concept from the academic sphere to industry (Ruhanen, 2008) and that the term has been abused by the public sector, which has incorporated it into its plans as a guiding principle. However, this contradicts with the short-term interim goals related to growth (Hall, 1994).

There are very few examples where true sustainable tourism has been achieved or even attempted (McKercher, 2003). Calvià, in the Balearic Islands, was a promising case but today it is very far removed from being a sustainable destination (Dodds, 2008). Consequently, there is an overall pessimism regarding the possibility of achieving a true sustainable development of destinations, and authors such as Lawn (2011) or Kerschner (2010) believe that today sustainable development, that is, development without growth, is not sufficient and a real degrowth would be required to ensure the future of the destinations.

Therefore, even with all the progress that has been made, essentially related to a weak type of sustainability (Vera and Ivars, 2003), today, sustainable tourism is still more of a desire than a reality, given that, beyond the many models and myriad of existing indicators, there are relatively few success stories in the application of true sustainability in tourist destinations. This is particularly true in the case of mass tourism destinations, where it is doubtlessly even more necessary (Wall, 1992; Berno and Bricker, 2001).

3. The STD approach as a reference to rethinking sustainability

The STD is a new concept on which there is currently no basic consensus (Del Chiappa and Baggio, 2015). It can be analysed from different perspectives: territorial and public management, from the point of view of private agents, etc. (Ivars, Solsona and Giner, 2016). Spain is one of the principal destinations where this approach has experienced a greater development (Gretzel *et al.,* 2015; OECD, 2018), driven by certain institutions (particularly AENOR and SEGITTUR on a national level and regional initiatives, such as the one developed by the Valencian Tourist Agency and the Valencian Institute of Tourist Technologies).

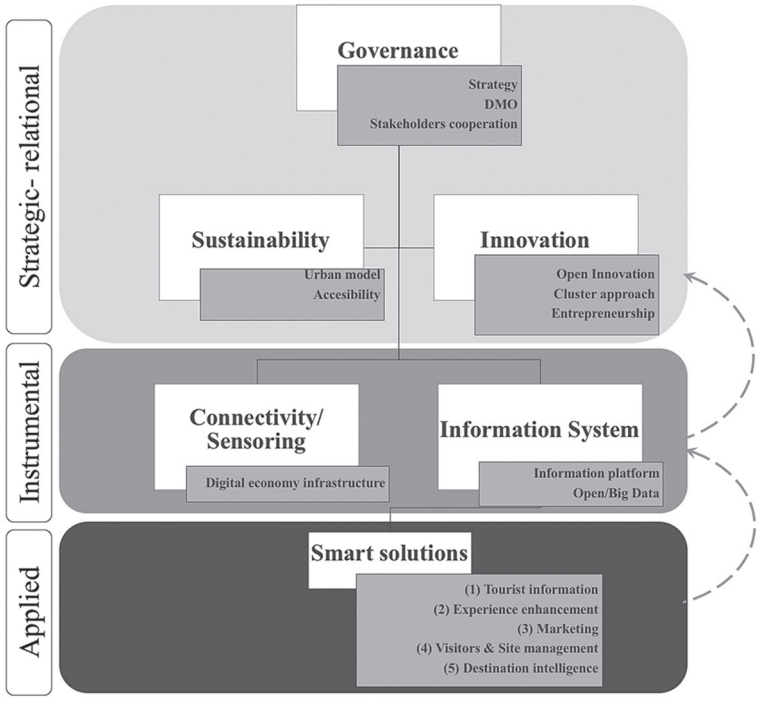
According to SEGITTUR, an STD is «an innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of the tourist area, accessible to everyone, which facilitates the visitors' interaction with and integration into their surroundings, increases the quality of the experience at the destination, while also improving the quality of life of its residents» (SEGITTUR, 2015: 32). Essentially, the STD represents an adaptation to tourism of the Smart Cities concept (Gretzel *et al.,* 2015). Smart cities are understood as being urban spaces in which information and communication technologies (ICTs) play a fundamental role in the design of innovative urban spaces in order to facilitate their sustainability and improve the lives of their inhabitants (Buhalis and Amaranggana, 2015; SEGITTUR, 2015:24; Ivars *et al.,* 2016). STDs are different to Smart Cities due to their blurred geographical boundaries, they are oriented more towards the tourist than the resident, they have a shared governance system through mixed public-private bodies in which all of the stakeholders are represented, the scope of actions goes beyond the stay in the city (tourist motivation and loyalty), and there is a strong emphasis on competitiveness and the improvement of the experience of the visitors (SEGITTUR, 2015). Specifically, a key element of the STD is the interconnection between the different agents of the destination through a central platform or a smart headquarters which receives the inputs of different sources and transforms the data into information and services so that the institutions are able to manage the destination more efficiently and companies can offer services with added value and translate into more satisfactory experiences for the tourists (Boes, Buhalis and Inversini, 2016; Buhalis and Amaranggana, 2014).

From an operational perspective, the UNE 178501 regulation referring to the requirements of the management systems of smart tourist destinations constitutes an interesting reference. The management system is based on four pillars: innovation, technology, universal accessibility and sustainability, which is one of the principal objectives of the STDs and incorporates the economic dimension linked to competitiveness, the social component related to the quality of life of the residents and the environmental dimension connected to the efficient management of natural resources. Although technology has a prominent role in the STDs, the existence of an STD does not mean doing the same but with technology. Rather, it involves the incorporation of new ways of managing the destination and a reinforcement of public-private cooperation (INVAT.TUR, 2015). Technology is not important *per se*, but because of the potential interactions that its use can imply with respect to traditional management. Furthermore, as a more general concept of smart territory, the STD links sustainable development with competitiveness (Vegara and Rivas, 2004; Calderero, Sainz and Ugalde, 2006). Without sustainability, a destination cannot be conceptualised as smart.

The connections between smartness and sustainability are expressed on two complementary levels: the strategy of the destination and the application of technologies for a more efficient environmental management. Without a doubt, both levels are connected to a new governance framework, a fundamental pillar for the development of an STD. Ivars *et al.* (2017) propose a systemic approach for managing an STD in

which three levels interact: the strategic-relational, the instrumental and the applied levels (Figure 1). The strategic-relational level depends on an appropriate governance which establishes a sustainable territorial-tourism model shared by the local society. This reference model provides the basis on which to develop the smart solutions adapted to the needs of the destination which are supported, from the instrumental point of view, by technology and the information system. Consequently, the development of an STD should contemplate the sustainability of the tourism model as a premise and not merely apply technologies to improve traditional processes. That is to say, the STD must assume the management of tourism growth in a sustainable way or, even more radical alternatives should be considered, such as evolving towards steady state or degrowth situations.

Figure 1. Systemic Smart Tourism Destination Model



Source: Ivars *et al.,* 2017.

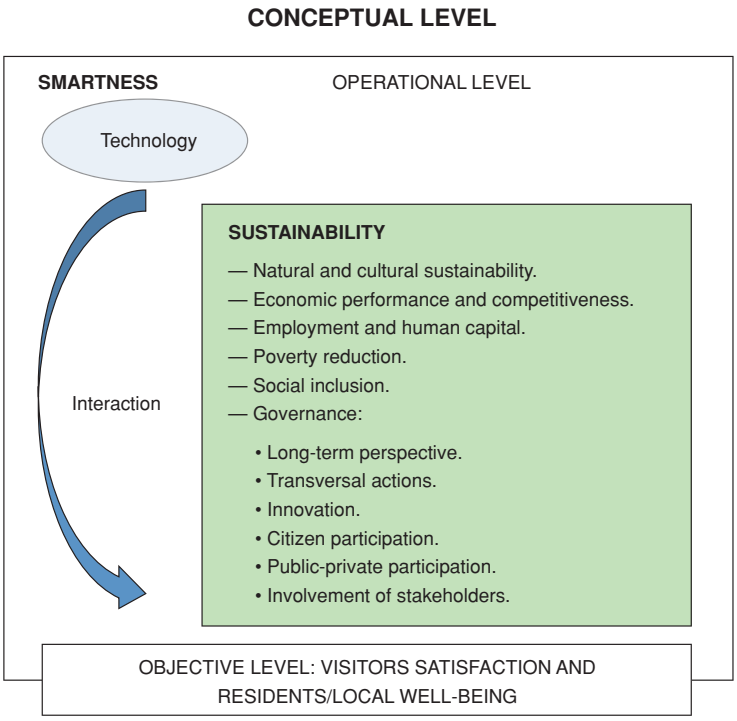
The strategic approach is fundamental, although, as pointed out by Ali and Frew (2013), we should remember that in the field of sustainable development, the policies have been oriented more towards strategy formulation than strategy implementation and that, currently, technologies constitute a fundamental support to transform theory into action. In this sense, the possibilities of technological application are enormous and truly complex given the rapid evolution that they are

experiencing. Undoubtedly, technological infrastructures (public transport networks, electrical grids, infrastructures related to the water cycle, telecommunication networks, smart buildings, etc.) constitute a basic pillar for the functioning and management of the city. However, what makes a city or a destination smart are information and communication technologies (ICTs), which enable the generation of new data sources and the integration and exploitation of information for decision making in real time, thanks to the convergence of technologies such as the Internet of things, cloud computing and big data, among others (Ontiveros, Vizcaíno and López, 2017).

The still scarce research on technology and sustainability in tourism has mainly focused on ICTs. Traditionally, most ICT developments in tourism have concentrated on marketing, distribution and profitability rather than on facilitating responsible tourism; a line of research with great potential (Benckendorf *et al.,* 2014). Ali and Frew (2013) conducted an interesting systematization of ICT-based tools/applications for sustainable tourism development. Benckendorf *et al.* (2014) focus more on the impact of ICTs on the objectives of sustainable tourism in the three of its four dimensions (environmental, economic and social) of sustainability. Gösling (2017) has also conducted an exploratory analysis of the impact on these three dimensions of tourist behaviour derived from the platforms that have notably transformed the tourism system (different types of platform: online reservations —Booking, Hotels, etc.—; sharing and peer-to-peer marketplaces —AirBnB, Uber, etc.—; online travel agents —Expedia, Orbitz, etc.—; evaluation, opinion and advice —Tripadvisor, Zoover, etc.—; and travel identity —Facebook, Instagram, etc.—). Within the framework of these new lines of research, this study seeks to contribute to the analysis of the relationships between ICTs and sustainability from the perspective of the current paradigm of smart destinations.

The concepts of sustainability and smartness share many common elements (Figure 2). On a conceptual level, the former is implicit in the latter. That is, a destination cannot be considered as being smart if it is not sustainable. Figure 2 illustrates this fact by including the set that makes up sustainability within the larger set called smartness. Within the set of sustainability, its pillars are framed, highlighting in the governance pillar, the subset of elements shared with the concept of smart tourism destination. On an operational level, a new governance framework predominated by long-term planning; the transversal nature of the necessary actions that go beyond the tourism-related institutions or departments; innovation and citizen participation; public-private collaboration and the involvement of all of the stakeholders are traditional elements —in the sense that they have been widely debated and accepted in the existing literature— shared by both concepts, as well as other desirable approaches, such as the achievement of competitiveness —also subsumed in smartness— of the destinations. Therefore, it should be acknowledged that the term STD is highly ambitious, given that it could be argued that if it has still not been possible to achieve the sought-after sustainability —which constitutes a part of the STD— it is hard to imagine reaching a broader whole —smartness— in which sustainability is simply one element (Perles and Ramón, 2017).

Figure 2. Shared elements between sustainability and Smart Tourism Destinations



Source: own elaboration.

The relationship between sustainability and smartness has been analysed within the framework of the smart city. It has been found that there is a need for greater conceptual precision and we can clearly rule out that smartness directly presupposes the sustainability of a specific geographical space. Different authors have analysed the role of sustainability in the strategies of smart cities from different perspectives and have concluded that it is insufficiently developed and should be better integrated into the smart city projects (Ahvenniemi *et al.,* 2017; Bibri and Krogstie, 2017; Haarstad, 2017). Ahvenniemi *et al.* (2017) even recommend the use of «smart sustainable cities» as a more accurate term and its use is growing both in the field of cities and tourist destinations in order to emphasise the dimension of the sustainability.

Without a doubt, in this complex interrelationship, the differential feature is derived from the intensive use of technology in the smart cities and destinations. The potential benefits that this use could have for the recipe based on traditional

ingredients (public-private cooperation, involvement of stakeholders, etc.) are, today, unknown. In Figure 2 these potential benefits are highlighted with the arrow named *interaction*. Within this context, the opportunities created by elements such as sensorization or big data with the monitoring and measurement of all types of tourist behaviours and subsystems of the destination —management of water, waste, urban mobility, etc.— can contribute to determining the true costs and benefits of each tourism development model. This enables their profitability to be established and provides better information for the decisions adopted by policy makers and, in short, makes the term operational so that, unlike the case of sustainability, it is not used merely in a rhetorical sense (Perles and Ramón, 2017).

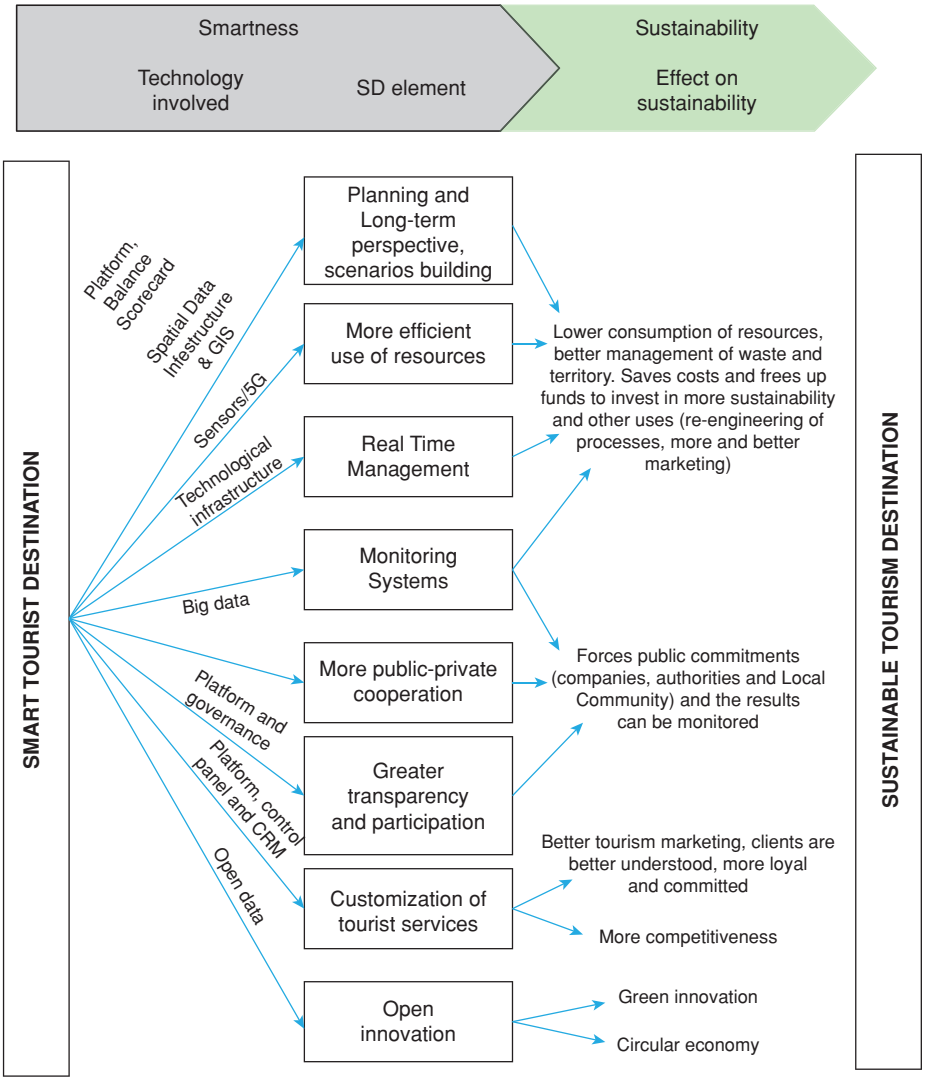
In order to avoid this possibility, below we will describe a conceptual model that seeks to describe the aspects that connect the two concepts and establish the possible transmission mechanisms which, at least from a theoretical point of view, may be more relevant in this context. All of this has the objective of directing the potential future research efforts in this field and improving the management of the destinations from a comprehensive perspective.

4. Towards a synergetic model for smart and sustainable destinations: smart sustainability

From the smart cities approach, there are still many gaps in the research on smart sustainable cities which require integrated models that incorporate both smartness and sustainability (Bibri and Krogstie, 2017). These gaps are still more evident in the field of tourist destinations because the evolution of destinations towards sustainability had still not been resolved before the paradigm of the smart destinations arose and the integration of the two perspectives is not clear and favours, again, rhetorical approaches and few practical results. In order to integrate the two perspectives, a synergetic model between smartness and sustainability is proposed (see Figure 3).

Figure 3, which is one of the main results of this paper, reflects the principal mechanisms that connect smartness with tourism sustainability through the corresponding technology in a model which has the main advantage of being measurable which can therefore allow us to support the decision-making process and communication with the different stakeholders. In the next subsections, we will detail these mechanisms, in the order of appearance in the Figure 3 (SD element boxes), identifying the fundamental aspects of smartness and sustainability which benefit from this synergetic approach. It should be noted that some closely related elements, such as monitoring systems and real-time management or public-private cooperation and open innovation, are included in a single section.

Figure 3. Theoretical channels of transmitting smartness to sustainability



4.1. Planning and a long-term perspective, scenarios building

Planning as a basic function of tourism policy and management forms part of the governance framework and, therefore, is favoured by other fundamental aspects. In particular, those relating to the improvement of the information, participation and collaboration among stakeholders and the monitoring of the planning process variables. Therefore, a new scenario emerges for tourism planning thanks to the instru-

mental contribution of technology, which should not be confused with a type of technocratic and supposedly neutral planning which shies away from the large challenges of planning from a sustainability point of view, such as the territorial-tourism model and the limits to growth.

Among the ICT applications for planning, we can highlight computer simulations, which help to visualise future scenarios and to develop forecasting techniques, or Geographical Information Systems (GIS), that can capture, store, analyse and display large amounts of geographical data (Ali and Frew, 2013). There are also computerised systems of indicators that enable us to monitor and control planning, an aspect which is generally neglected in tourism and territorial plans.

4.2. More efficient use of resources

Within the context of smart cities, obtaining higher levels of efficiency (reduction in consumption and waste, cost saving, etc.) is achieved through the interconnection of sensors and technological infrastructures with a central information platform, the Smart City Operating System (SCOS), «the platform of platforms» that integrates different data sources (sensors, social networks, etc.) and enables the simultaneous use by different users (Government, businesses, professionals, etc.) (Ontiveros *et al.,* 2017). Obviously, the SCOS contribute to improving urban and tourism management in the cities but they are only found in cities with a certain urban range, usually medium-sized and large cities. Furthermore, the more developed SCOS with a higher degree of administrative coordination provide a comprehensive vision of the city and the possibility of managing it in real time.

Similarly, the application of technology to tourism destination management has given rise to the creation of Destination Management Systems (DMS) that consolidate and distribute a comprehensive range of tourism products through a variety of channels and platforms (Ali and Frew, 2013). However, these systems are not widespread and their functions are unequal. In the case where the DMS include data on environmentally sensitive tourism resources and allow their management (reservations, access control, etc.) they would be a good tool for improving the sustainability of the destination (Buhalis, 2003; Benckendorf *et al.,* 2014). Therefore, the DMS and their integration into the SCOS still form part of a series of potentialities pending development.

With these improvements we can expect an equal or greater volume of tourists, but with a less intensive consumption of resources and a lower generation of impacts; in short, a greater environmental sustainability of the destination. The cost saving derived from this better management will enable more resources to be allocated to investing in improving the sustainability of the destination —wastewater treatment plants, conservation of resources and natural parks, etc.—. It will also lead to improving knowledge about the needs of the tourist and a better promotion and service provision to the visitor which should result in the increased competitiveness of the destination and its economic sustainability.

4.3. Monitoring system and real time management

The possibilities offered by technology for monitoring environmental and tourism parameters constitute an interesting opportunity to improve the systems of sustainability indicators and guarantee their continuous application and a real time management.

Many indicators systems have been proposed in the field of tourism, although the number of systems which are actually applied is lower due to technical and conceptual difficulties (Torres and Saarinen, 2014). Within this context, the use of ICTs would facilitate the collection of data, their processing and analysis, as well as clearly contributing to their diffusion and the development of benchmarking techniques (Choi and Sirakaya, 2006). On a destination level, it is recommended to link the indicators with the DMS and, where applicable, with the SCOS, which contribute the added value of interrelating data from different layers of geo-referenced information which, in many cases, is measurable in real time. The general system of the destination would be complemented with the environmental management information systems of the larger local companies and a more sophisticated environmental management, generally linked to certifications of environmental management.

Monitoring generates an enormous volume of data with two fundamental results: the possibility of applying Big Data techniques and the opening of the information in the form of Open Data, as a formula of transparency and of fostering innovation in the infomediary sector. Big Data encompasses both data generated from the sensorisation of the destination and new data sources with relevant information for management from the point of view of sustainability, such as, the space-time concentration of tourists in cities obtained through the analysis of the information of the online booking services (Batista *et al.,* 2018) or of the social networks in a complementary manner (Salas-Olmedo *et al.,* 2018). On the other hand, the information relating to the sustainable development of the destination should be a priority when opening data, an excessively slow process with very few noteworthy results in the field of tourism, as pointed out by Celdrán-Bernabeu, Mazón and Giner (2018) in their analysis on open data in tourism in the Spanish Network of Smart Cities.

4.4. Public-private cooperation and open innovation

Transparency and the sharing of information inherent to the concept of smart tourism destination constitute stimuli for cooperation, the transfer of knowledge and innovation in destinations. The efforts required to reach true sustainability cannot be undertaken by any agent acting alone. The extent to which the commitments adopted by companies and authorities may require shared efforts in order to be carried out and these commitments should be transparent for all of the stakeholders —this is the truly innovative aspect of the STDs in this field—. Participation and public-private cooperation are fostered to create a new form of governance, favouring an open innovation framework in the destinations.

In this way a management based on knowledge is favoured. As indicated by Ruhanen (2008), there is a gap in the transfer of knowledge to the tourism sector in practice which could be resolved through the application of ICTs. In the study conducted by Ali and Frew (2014) on the role of ICTs in sustainable development, the majority of the destination management organizations strongly agreed or agreed that the use of ICTs is an innovative approach to sustainable tourism. Hjalager (1997) referred to the importance of ICTs in classical process innovations through the improvement of productivity, and most of all, in process innovations in information handling where they are transformed into a management tool to improve efficiency, without forgetting their contribution to image promotion and communication with the customer. On a destination level, all of this information will help the stakeholders better understand their responsibility in the sustainable tourism process and make them more aware of appropriate and ethical behaviours (Ali and Frew, 2014).

The predominance of small and medium enterprises (SME) in tourism destinations implies limits that can be overcome through the use of ICTs. Benckendorf *et al.* (2014) indicate that ICTs contribute to building different types of capital for SMEs (financial, human, natural, social and physical), favouring the inter-business relationships and their business to business (B2B) and business to customer (B2C) activities, a relational environment facilitated by ICTs which would reach their peak in a smart destination, as highlighted by Del Chiappa and Baggio (2015) when considering the STD as a networked system of stakeholders delivering services to tourists, complemented by a technological infrastructure aimed at creating a digital environment which supports cooperation, knowledge sharing and open innovation.

In addition to the transversal innovation arising in the STD, there is a line of research in favour of green innovation. The basic arguments of this type of innovation are based on the efficiency in management, the protection of the biodiversity and creating the conditions for growth and sustainable development in local communities, that is, favouring green growth (OECD, 2013), a similar approach to sustainable development and equally criticised from the point of view of its real results (Hall, 2014).

4.5. Greater transparency and participation

Transparency and citizen participation are key elements of sustainable and smart tourism destinations. The functioning of the indicators system in smart tourism destinations would improve transparency and social participation in the management and participation processes. In this sense, a crucial ally of the increasing monitoring and diffusion of information is citizen participation on two complementary levels: participatory sensing, described as the use of sensors technologies to gather and share data in order to collectively monitor the urban environment, and the qualitative leap in participatory planning through the development of the e-involvement stakeholder (Presenza *et al.,* 2014).

4.6. Customization of tourist services

The increased generation of information appropriate to the STD also favours the user perspective which, in turn, becomes a new source of data generation through user generated content (UGC), an information flow which is essential for shaping the organic image of a destination and for the inter-relationships between tourists and between tourists and the agents of the destination. The tourist, conceived as a prosumer, can receive more quantitative and qualitative information about the sustainability of the destination and make decisions regarding the choice and purchase of tourism services. Furthermore, the tourism awareness actions of the destinations are enhanced, favouring a more responsible behaviour in the destination, which is complemented with community engagement actions based on sustainable development.

The degree of environmental awareness of the demand and its relationship with the attitudes and behaviour of the demand in the destination has been studied in depth. The findings reveal a gap between the attitudes declared, generally ones of responsibility towards the environment and a behaviour which is less aware and responsible (Swarbrooke, 2011). Within this context, there is no doubt that the ICTs can contribute to raising awareness and improving the behaviour in the destination. In fact, there are many initiatives related to the calculation of the ecological footprint (Gossling, 2011) or carbon calculators (Ali and Frew, 2013). Although their use is far from massive, it is growing and we can observe a link between these tools and the destinations, which should go beyond their promotional use, or greenwashing, as defined by Ali and Frew (2014) and convert them into an effective management and communication tool, taking into account that they integrate the whole trip cycle, including transport and, therefore, provide an overall perspective of the impact of the tourism activity which may be harmful to certain destinations such as long haul destinations.

Finally, smart solutions contribute to improving the tourist experience, thanks to a greater availability of information in real time which tourists can access whenever they need to (contextual marketing or location based services), even in a personalised way. For example, the management of visitors to tourist attractions through the use of ICTs contributes to the preservation of the resources (setting of visitor thresholds, diversion of flows to protect sensitive areas, interpretation, etc.) and also improves the satisfaction with the tourist experience (use of virtual or augmented reality techniques, for example).

As well as favouring the adoption of improvements in environmental resource efficiency, the new technology tools can also increase the efficiency of the promotional efforts, detecting and monitoring the new needs of the demand and orienting promotion towards more profitable and committed segments. In this way, we can expect an increase in the satisfaction with the tourist experience of the visitors and a greater loyalty among them which translates into an improved economic, cultural and social sustainability of the destination.

5. Conclusions

The sustainability of tourism destinations has proved to be a complex task, with little practical progress or even setbacks as we are being attending to the gradual expansion of tourism activity at a global level. Recently, the irruption of the smart city and the smart tourist destination has opened new hopes to achieve the desired sustainability of tourist areas. This article analyses the sustainability and smartness of tourist destinations. An exhaustive review of the literature has revealed the existence of a strong connection between the two concepts, both, from a theoretical viewpoint and on an operational level. In fact, sustainability and smartness share many common elements. Long-term vision and planning, innovation, public-private cooperation and the involvement of the stakeholders are traditional elements which form part of both concepts, shared with other paradigms, such as competitiveness.

The revision of the existing literature has allowed the authors to develop a proposal of a theoretical model that links both concepts. The proposed model facilitates the understanding of the causal mechanisms which link smartness and sustainability, which would induce the development of new lines of research on a theoretical and applied level. The analysis carried out exploits the synergies between the two paradigms and creates a synergetic model focused on smart sustainability, based on a governance framework that applies technology to five fundamental pillars: planning, the efficient management of resources; monitoring, transparency and participation, public-private cooperation, knowledge, innovation; and communication, awareness raising and the improvement of the tourist experience. In the proposed mechanisms, technology intensive use done by smart tourism destinations would play a key role through the potential interactions that may arise between the technologies and the basic elements of sustainability —planning and long-term perspective, scenarios, building, more efficient use of resources, monitoring systems and real time management, public-private cooperation and open innovation, greater transparency and participation and customization of tourist services—, which could accelerate the process of achieving it. In this sense, the relationship between smartness and sustainability cannot be conceived linearly.

In the proposed model theoretical relationships are suggested. Future empirical research should validate the causal relationships implicit in these mechanisms. Although, in theory, smartness inevitably entails the sustainability of the destination, in practice, it has been observed that this relationship is still ambiguous and, more importantly, does not guarantee effective progress towards sustainability. Thus, future research should be also focused on the practical side so as to avoid a situation where, as in the case of sustainability, the concept of smart destination is limited to a merely rhetorical use, frustrating the hopes that smartness has opened up in the generation of a new approach to tourism management.

Apart from the academic debate —theoretical or empirical— from a practical point of view, the smart application of technologies gives rise to new possibilities

for sustainable tourism development. However, preventive measures should be taken with respect to the limitations detected in the management of smart cities and destinations, including the existence of experimental projects which cannot be generalised yet; the cost-profit ratio of the investments; the frequency of top-down solutions which do not adapt to the needs of the destinations; or the environmental impact of the new technologies.

Finally, it is necessary to reflect on the objectives of tourism development. The smart destination approach may favour incremental innovation under the scope of concepts such as green innovation or green growth, but the big decisions about territorial and tourism models should derive from governance processes and not the mere application of technology, the so-called technological solutionism, which can be more of an obstacle than a useful tool for achieving true sustainable tourism development if it is used to legitimise growth processes which confer the capacity to resolve environmental and socio-economic problems to technology which it does not have. On the contrary, the concept of smart sustainability proposed in this study is oriented more towards paradigms of strong sustainability which impose limits to growth and implement the principles of the circular economy as opposed to the linear growth approaches, which are becoming completely obsolete given the growing pressure on natural resources and the threat of climate change.

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Section ARTICLES

From smart destinations to smart tourism regions

Ulrike Gretzel*

ABSTRACT: There is growing interest in developing smart tourism beyond individual smart destinations, but research and practice currently do not supply the necessary conceptualizations that could inform smart tourism development at a regional level. This paper argues that this is the case because of smart tourism's roots in smart city ideas and literature. It discusses the main pillars of smart tourism and smart destinations and then illustrates how pervasive urban biases are in the smart development arena. The paper then highlights the many ways in which these are problematic for reaching regional smart tourism understandings and designing appropriate regional-level strategies. It calls for smart tourism regions to be defined beyond clusters of individual smart destinations and across all domains of smartness.

JEL Classification: R12; O32; L83.

Keywords: smart tourism; smart destination; smart city; smart region; scalability; governance.

De destinos turísticos inteligentes a regiones turísticas inteligentes

RESUMEN: Existe un creciente interés en el desarrollo del turismo inteligente más allá de los destinos inteligentes individuales, pero actualmente la investigación y la práctica no son capaces de ofrecer las conceptualizaciones necesarias que permitan conformar el desarrollo turístico inteligente en un nivel regional. Este artículo plantea si esto se debe a las raíces que el turismo inteligente tiene en las ideas de ciudades inteligentes y en la literatura. Se discuten los pilares principales del turismo inteligente y de los destinos inteligentes y, después, se ilustra cómo los sesgos urbanos generalizados existen en el área de desarrollo inteligente. Este artículo, después, resalta las múltiples formas en las que estos sesgos son problemáticos para la consecución de un entendimiento sobre el turismo inteligente regional y para el diseño de estrategias apropiadas para un nivel regional. Es necesario que las regiones turísticas inteligentes sean definidas como algo más que agrupaciones de destinos inteligentes individuales y en los que sean aplicables todos los dominios de inteligencia.

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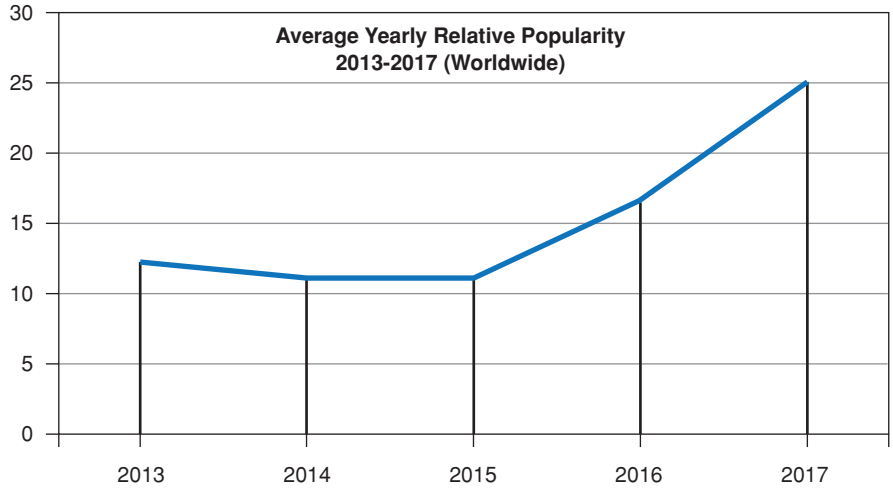
Palabras clave: turismo inteligente; destinos inteligentes; ciudades inteligentes; regiones inteligentes; escalabilidad; gobernanza.

1. Introduction

Smart tourism is a concept that has become very trendy in the past five years, both in industry as well as in academia. Google Trends indicates worldwide increases in searches for «smart tourism» (Figure 1) since 2013. This increase in popularity and attention also applies to research. Google Scholar currently retrieves 2,470 results for the keyword «smart tourism». Whole countries like China (Wang, Li and Li, 2013), Spain (*http://www.destinosinteligentes.es/*) and South Korea (Koo *et al.*, 2013) have launched smart tourism development programs and the European Union has recently introduced its «European Capital of Smart Tourism» initiative (PR Newswire, 2018). Although there are regional differences in the extent to which smart tourism has been adopted as a vision for tourism and a field of inquiry, with Asia and Europe leading the pack (Pan *et al*., 2016), smart tourism now occupies the minds of destination managers, tourism providers, IT developers, statisticians, consultants, policy-makers and researchers around the globe.

Figure 1. Trends in Worldwide Google Searches for «Smart Tourism»



Source: Google Trends (*https://trends.google.com*).

Smart tourism is sometimes wrongly understood as anything related to technology adoption and use in relation to tourism offerings or too narrowly conceptualized as developments resulting from IT as the sole driver of innovation goals (Xiang, Tus-

syadiah and Buhalis, 2015). Instead, smart tourism should be regarded as a tourism development and management mindset or philosophy with larger implications for tourism governance and for the strategic orientation of the destination. Gretzel *et al.* (2015a) clearly distinguish smart tourism from e-Tourism by emphasizing its connection to the physical attributes of a destination, its conceptualization as a larger ecosystem and its dependence on public-private partnerships. While e-Tourism focused on the informatization and virtualization of touristic exchanges and the exploitation of digital value chains, smart tourism bridges the virtual and the physical, encompasses broader techno-utopian visions of destinations, and calls for strong governance. Further, whereas e-Tourism spans all phases of the tourism experience (pre-, during and post-travel), smart tourism experiences are currently firmly anchored around experiences during the trip, usually not even accounting for movement to and from a destination.

Adopting such a broader conceptualization of smart tourism as a tourism development and management strategy that goes beyond technology implementation, this paper will first elaborate on the essential elements of smart tourism and their applications to smart destinations. It will then address the scalability of smart destinations to a regional level by examining the assumptions of smart tourism, some of which are deeply rooted in urban understandings of smartness as part of the smart city discourse. In conclusion, it will discuss the implications of such a regional-level conceptualization of smart tourism for research as well as smart tourism development.

2. Pillars of Smart Tourism

While the idea of smart cities emerged from the «smart growth» discussions resulting from the establishment of the Kyoto Protocol and is therefore firmly anchored in sustainability goals (Cocchia, 2014), smart tourism as a concept appeared much later, after IBM introduced the notion of a «Smarter Planet» (*https://www.ibm.com/smarterplanet/us/en/*) that focused on cloud computing, sensors, mobile technology, big data and analytics to transform businesses and institutions. It is therefore not surprising that early conceptualizations of smart tourism stress the role of IT in smart tourism (Wang, Li and Li, 2013). In particular, smart tourism from this perspective is concerned with taking advantage of a range of smart technologies, such as sensors, beacons, mobile phone apps, radio-frequency identification (RFID), near-field communication (NFC), smart meters, the Internet-of-Things (IoT), cloud computing, relational databases, etc., that together form a smart digital ecosystem that fosters data-driven innovations and supports new business models (Gretzel *et al.*, 2015b). According to this big data and technology perspective, smart tourism has been defined as:

> «tourism supported by integrated efforts at a destination to collect and aggregate data derived from physical infrastructure, social connections, government/organizational sources and human bodies/minds in combination with the use of advanced technologies to transform that data into on-site experiences and business value-propositions with a clear focus on efficiency, sustainability and experience enrichment» (Gretzel *et al.,* 2015a: 181).

However, the concept of smartness has evolved considerably, and smart development agendas have become much more comprehensive. In the smart city context, smartness is now largely understood from a socio-technical perspective (Nam and Pardo, 2011), although technology remains a dominant feature of smart city frameworks (Yigitcanlar *et al.*, 2018). Nam and Pardo (2011) suggest that smartness has three dimensions, namely a technological, a human and an institutional one. Accordingly, Yigitcanlar *et al.* (2018) define the assets and at the same time drivers of smart city development as relating to technology, policy and community and the domains it applies to as economy, society, environment and governance. Their framework largely maps onto the widely used «Smart City Wheel» developed by Boyd Cohen (Smart Circle, 2013), although the wheel splits the society domain into smart mobility, smart living and smart people. Based on a comprehensive review of the smart city literature, Yigitcanlar *et al.* (2018) further establish the following eight areas, two for each application domain, which smart city development seeks to improve: 1) Governance; 2) Planning; 3) Productivity; 4) Innovation; 5) Liveability; 6) Wellbeing; 7) Sustainability; and, 8) Accessibility. Integrated governance, comprehensive and participatory planning, productivity gains and a skilled workforce, competitive advantages, an innovation culture, greater mobility, better infrastructure, enhanced quality of live, the responsible management and use of natural resources, as well as an inclusive community therefore constitute the major outcomes of smart city development.

Smart tourism is concerned with applying these ideas to tourism contexts. In line with the technology-based perspective, Gretzel *et al.* (2015a) establish data collection, open exchange and processing as the fuel for the innovative smart tourism business ecosystem. Gretzel, Ham and Koo (2018) describe smart tourism as consisting of five layers: 1) a physical layer that includes natural and human-made touristic resources as well as transportation and service infrastructures; 2) a smart technology layer that links to this physical infrastructure and provides back-end business solutions and front-end consumer applications; 3) a data layer that includes data storage, open data clearing houses and data-mining applications; 4) a business layer that innovates based on the available technologies and respective data sources; and, finally, 5) an experience layer in which the resulting technology- and data-enhanced experiences are consumed. They also establish governance as needing to span across all layers to ensure necessary investments, facilitate coordination and oversee the establishment and achievement of goals. Lalicic and Önder (2018) state that governance in the context of smart tourism encompasses a range of tourism stakeholders with diverse interests and requires the involvement of tourists and residents alike. Thus, while smart cities only consider the demands of residents and local businesses, smart tourism deals with a much more dynamic ecosystem in which residents can be producers of experiences (*e. g.* via peer-to-peer platforms such as Airbnb or Eatwith), there are temporary residents (*e. g.* tourists) and therefore seasonal demands on infrastructure and particular privacy concerns (Anuar and Gretzel, 2011), there are multiple levels of governance, and the smart economy is supported by businesses from a multitude of industries and beyond the scope of a particular city

(*e. g.* foreign airlines) that use the city infrastructure and resources to provide smart experiences (Gretzel *et al.*, 2015b).

The goals of smart tourism are either directly adopted from the smart city literature and initiatives or remain somewhat ill-defined. Buhalis and Amaranggana (2015) define the goals of smart tourism development as competitiveness, sustainability and inclusiveness. Focusing on the innovation and productivity dimensions of smart tourism, Boes, Buhalis and Inversini (2015) describe the strategic orientation of smart tourism as aimed at leadership, entrepreneurship, human capital, innovation and social capital development. Del Chiappa and Baggio (2015) highlight learning and knowledge management as focal drivers and at the same time outcomes of smart tourism. Lamsfus *et al.* (2015) focus on the deep understanding of human mobility as the goal of smart tourism. In contrast, Gretzel *et al.* (2015a) depart from the smart city literature and establish tourist experience enhancement as the ultimate goal of all smart tourism efforts. Similarly, Buonincontri and Micera (2016) stress increased levels of experience co-creation as an important outcome of smart tourism. Goals have also been formulated and communicated by agencies in charge of smart tourism development. SEGGITUR (2018) lists the following as pivotal areas of smart tourism development in Spain: 1) Technology; 2) Sustainability; 3) Innovation; and, 4) Accessibility. The EU Capital of Smart Tourism initiative (European Commission, 2018) provides awards for achievements related to technology, sustainability, accessibility, digitalization and cultural heritage/creativity.

While smart tourism is a flexible concept that is sometimes discussed at the events (*e. g.* Bustard *et al.*, 2018), industry (Buhalis and Leung, 2018) or the company level (see Neuhofer, Buhalis and Ladkin, 2015), it is mostly applied to the destination level. The smart destination has been described as:

> «An innovative tourist destination, built on an infrastructure of state-of-the-art technology guaranteeing the sustainable development of the tourist area, accessible to everyone, which facilitates the visitors' interaction with and integration into their surroundings, increases the quality of the experience at the destination, while also improving the quality of life of its residents» (SEGITTUR, 2018, n.p.).

Smart destinations have been identified as a new paradigm for destination management (Ivars-Baidal *et al.*, 2017). Jovicic (2017) claims that without the use of digital technologies that enable public–private–consumer collaboration, it has become impossible for destinations to achieve successful market valorization of their geographical attributes and that this trend requires reconceptualization of what we mean by a destination and what is involved in its management. Femenia-Serra, Perles-Ribes and Ivars-Baidal (2018) argue that smart destinations use technology to fundamentally change the relationships tourists have with the destination. Koo *et al.* (2016) define the pillars of smart destination competitiveness as involving the implementation of smart technologies and intelligent systems that support resource stewardship, effective marketing, efficient organization and superior service. It is important to note that the literature almost exclusively discusses the application of smart tourism to city destinations. This urban bias will be further explored in the next section.

3. Urban bias in smart tourism conceptualizations

As indicated above, the idea of smart tourism emerged from the broader and much older discourse on smart city development (Cocchia, 2014), with smart destinations often described as special instances of smart cities (Boes *et al.*, 2015) and smart tourism being a specific application area within smart city initiatives (Gretzel *et al.*, 2015a). The focus on city destinations is therefore one that naturally evolved from the smart city frameworks. In general, there is an infiltration of smart development discourses with «urban fantasies» (Kim, 2014, p. 352) colored especially by Northeast Asian visions of cities. This is also true for smart destinations. The recent EU Capital of Smart Tourism initiative is also aimed at cities, with references to urban aspects being ubiquitous in the texts as well as the visuals on its website (*http://smarttourismcapital.eu/*). Gretzel *et al.* (2018) further illustrate for the case of Seoul, Korea that all smart tourism efforts are centered on the city and that no evidence of inter-city or regional initiatives could be found. Thus, conceptualizations of smart development generally reflect the idea of smart urbanism (Kitchin, 2014), and this is also the case for smart tourism.

There are also practical reasons for this urban bias. The higher concentration of technology companies, of a creative workforce, of communication and built infrastructure, of public transportation networks and of energy grids in urban spaces and, in the case of tourism, also the greater concentration of tourists within small spatial areas and with less seasonality all make smart tourism development much more feasible in the context of a city. Further, smart city development specifically addresses urban challenges such as traffic jams, energy consumption and crowding. As a concept it could therefore more easily be applied to urban destinations, which struggle with tourist mobility issues and overtourism. However, it is argued here that this «urban heritage» of smart tourism might conceptually limit its applicability to other types of destinations, such as rural destinations or tourism regions. To illustrate the extent to which urban biases are present, the specific areas of connectivity, mobility, built infrastructure and governance are discussed.

3.1. Connectivity

Connectivity is essential for the functioning of smart tourism. Whether connectivity is embedded in the smart tourism infrastructure (*e. g.* via an Internet of Things), is needed at the interface with smart tourists (*e. g.* to enable interactions with personal smart devices these tourists bring to the destination), or supports data exchanges to facilitate innovation, connectivity requires infrastructure and, thus, investments. Indeed, establishing connectivity has become a major focus of smart destinations such as Seoul, Korea (Gretzel, Ham and Koo, 2018), which invest heavily in the establishment of ubiquitous Wi-Fi coverage. Magasic and Gretzel (2017) point out that connectivity has been conceptualized as either existing or not, but in

reality, there are many different levels of connectivity. As part of their trips, tourists constantly move in and out of different connectivity zones (free Wi-Fi on the airport train versus data roaming while walking to the hotel) and need to negotiate various connectivity states (from high-speed to non-existing). Connectivity can be (willingly or unwillingly) restricted in terms of reach (*e. g.* confined to a particular area such as the hotel lobby) or in terms of bandwidth (*e. g.* free Wi-Fi not permitting video streaming). Connectivity significantly influences tourist experiences and satisfaction (Masri, Anuar and Yulia, 2017).

Because of higher density and smaller physical barriers, connectivity infrastructure is more likely to be developed in urban areas. Salemink, Strijker and Bosworth (2017) discuss the persisting digital divides between rural and urban areas in terms of IT availability, adoption as well as use. This is especially true for connectivity, with mobile phone network antennas being more concentrated in urban areas and free Wi-Fi zones being more common in the context of cities. Nevertheless, connectivity can still be spotty even in cities, and such connectivity issues grow exponentially outside urban areas. Further, connectivity requires energy. While energy grids are dense and charging devices is usually no problem in an urban setting, powering a smart destination's connectivity infrastructure might also require investments in energy infrastructure if smart tourism development is implemented at a regional level. Unfortunately, smart tourism development rarely discusses such basic level technology infrastructure investments and mostly focuses on end-user applications because of this urban bias.

3.2. Mobility

Battarra *et al.* (2016) indicate that smart city development initiatives have focused on efforts to combat urban traffic challenges. Similarly, Benevolo, Dameri and Auria (2016) identify city-focused goals such as the reduction of traffic congestion, the increase of transfer speeds and the decrease of transfer costs, as well as city-focused solutions such as car-sharing, urban traffic control systems, pedestrian zones and parking guidance applications. In their survey of smart mobility literature, Faria *et al.* (2017) confirm that urban viewpoints prevail. Garau, Masala and Pinna (2016) even specifically refer to smart *urban* mobility. Further, embedding smart technologies in public transportation networks is a key focus of much of the smart tourism development literature; simultaneously, taking advantage of urban traffic infrastructure such as traffic cameras is an essential part of heightening the «sensing» ability of a destination. Bike-sharing, a central aspect of smart tourism mobility solutions, also assumes short distances and urban street networks (Gretzel *et al.*, 2018). In a nutshell, smart tourism mobility has been conceptualized for a tourist who has many mobility options, needs to navigate through an environment filled with built infrastructure, traffic control systems and signage, and who moves through relatively small, dense areas for rather short periods of time. Such a notion of highly versatile and readily available mobility solutions is of course not applicable to regional destinations, where tourists

usually arrive in or rent personal vehicles, have to cover substantial distances, and encounter dispersed pockets of infrastructure. Due to the focus on urban settings, smart *regional* mobility, especially in a tourism context, has yet to be defined.

3.3. Built infrastructure

Much of the smart discourse relates to embedding technologies in built infrastructure, whether it is public transportation infrastructure, public buildings, homes or utilities infrastructure. In accordance with this focus on the built environment, smart tourism literature and practice has also focused on equipping museums, hotels, buildings that are touristic points of interest, and transportation infrastructure such as subways, airports and bus stations with smart technologies (*e. g.* Chianese and Piccialli, 2014; Alletto *et al.*, 2016; Faria *et al.*, 2017; Buhalis and Leung, 2018). Even in the case of Spanish smart tourism destinations, the emphasis is clearly on buildings and transportation, as illustrated by the website homepage (*http://www.destinosinteligentes.es/*). A Google image search on the IoT also delivers a myriad of logos and illustrations that focus on vehicles, various types of buildings and man-made objects. Only in the context of smart farming, of environmental monitoring such as forest fire detection and weather prediction, and in the case of tracking animals (both pets and wildlife) are references made to natural resources and living beings (Hill, 2016). Such application areas outside of urban contexts are, however, rarely discussed. As such, when smart tourism is discussed, its physical layer is typically conceptualized as buildings and objects that can be easily equipped with sensors, beacons or other types of smart technologies. In contrast, smart tourism infrastructure outside of city-scapes has not been fully conceptualized.

3.4. Governance

Fernández-Anez, Fernández-Güell and Giffinger (2018) highlight the key role of governance and stakeholder involvement as well as of a comprehensive vision for smart city development. Meijer and Bolívar (2016) suggest that smart city governance is not just about good administration of smart cities but involves a transformation of governing bodies and governance processes. Transparency, openness, accountability, collaboration, innovation and efficiency are common keywords used when smart city governance is described (Bolívar, 2018a; Chourabi *et al.*, 2012). Fernández-Anez *et al.* (2018) further stress that smart city governance is about tackling urban challenges, thus underlining the urban bias in smart city governance frameworks.

Leaning heavily on the smart city literature that advocates for «smart collaboration», which is defined as «promoting the use of new technologies to adopt a more participative model of governance» (Bolívar, 2018b: 57), smart tourism also discusses the need for participatory governance, including residents as well as tourists (Lali-

cic and Önder, 2016). La Rocca (2014) lists the following elements of smart tourism governance in a smart city destination context:

- engage in open data initiatives;
- coordinate among administrative levels;
- activate public-private partnerships;
- represent and foster integration of tourism in urban governance processes;
- safeguard and promote heritage and culture;
- promote active involvement of residential population;
- provide for network infrastructures;
- plan sensor network for touristic purposes;
- develop platforms that facilitate tourism-related exchanges;
- control energy and resources consumption;
- balance the integration of information for the common good with protecting privacy;
- enable sustainable solutions that reduce costs;
- reduce social conflicts.

Accordingly, Gretzel *et al.* (2018) argue that smart tourism calls for strong destination management and define the roles of smart destination management organizations (smart DMOs) as:

> «to lobby and maybe even partly sponsor the development of smart tourism infrastructure, to curate and manage smart tourism data, to facilitate development and uptake of smart tourism-related applications within the digital business ecosystem, to support tourists in learning about and consuming smart tourism experiences, and, finally, to link smart tourism with overall quality of life and sustainability development goals» (p. 201).

Implementing a smart tourism agenda is much easier for local DMOs than for regional ones due to their more intimate knowledge of the destination and more direct relationship with the various stakeholders.

Smart governance in an urban setting involves of course a relatively small number of institutions with clearly assigned responsibilities. Also, policies are typically much more defined and more easily implemented within a well-defined and geographically limited area. Kitchin (2014) argues that neither the smart technologies nor the smart data that fuel smart cities are neutral; rather, political agendas are firmly embedded in them. What these political agendas are and who promotes them should be more easily detectable the fewer players are involved in developing and implementing smart development policies. The smart city literature that deals with governance usually does not spend much time in defining the institutional players at work (Yigitcanlar *et al.*, 2018), suggesting that they are assumed to be established and easily identifiable. This is of course much more so the case in a well-defined, more homogenous urban area. Further, the residents that take part in participatory smart governance processes are assumed to be connected, informed and, most importantly, involved. To what extent these characteristics apply to tourism destinations with a higher proportion of temporary residents (tourists, second home owners, seasonal labor), and especially tourism beyond the city limits or across multiple cities, is of course questionable.

4. Conceptualizing smart tourism regions

In practice, smart tourism has indeed been mostly implemented at the city-level and with a focus on urban dimensions and challenges, with the exception of small island destinations (as evidenced by the yearly held Smart Island World Congress, see *http://www.smartislandcongress.com*), including Tasmania, Australia (*http://www.sense-t.org.au/projects-and-research/tourism*) and Cozumel, Mexico (The Yucatan Times, 2015), as well as some regional areas in Spain (see *http://www.destinosinteligentes.es/*), South-east Queensland, Australia (Sydney Morning Herald, 2015) and the Bay of Plenty region in New Zealand (Tauranga Government, 2006). A Google search for the keyword «smart tourism region» delivers only six results, of which four are actually relevant. The same search in Google Scholar reveals zero results, suggesting that the academic literature has not conceptualized smart tourism regions. In contrast, smart regions in general have received attention in practice (the EU currently funds several smart region projects) and theory, although also not to a great extent and mostly from a technology perspective (Morandi, Rolando and Di Vita, 2016). Existing literature often conceptualizes smart regions as existing around or between smart cities (Rolando, 2011). There is a tendency to especially smartify capital cities because of their greater population densities and larger budgets (Herrera Priano, López Armas and Fajardo Guerra, 2016). Areas around these capital cities are often subsumed into smart regions, as illustrated by the case of Helsinki (Markkula and Kune, 2015).

While the smart tourism pillars and overall goals remain largely the same when applied to tourism regions, there are imminent challenges regarding their scalability for all layers or elements of smart tourism. For instance, the innovative approaches needed to establish connectivity for smart tourism at a regional level have been discussed in the case of the Caribbean region (Hughriley.org, 2016). Herrera Priano *et al.* (2016) argue that even within smart cities, development initiatives are often limited in scope, e.g. focusing on Downtown areas or tourism precincts, because of their limited scalability. Further, it is important to note that Smart Tourism Regions are not just an agglomeration of a number of individual smart destinations; rather, they have unique characteristics and challenges and unique governance, infrastructure and development needs. Herrera Priano *et al.* (2016: 465) warn: «Combining N smart cities within the same territory will not necessarily lead to a smart region». Consequently, a regional perspective on smart tourism adds complexity and therefore requires appropriate conceptualization that takes the properties of regions into account.

Dameri (2013) defines the smart city as a well-defined geographical area. Regions are often ill-defined and sometimes only exist in the imagination of policy-makers. Tourism regions can exist solely in the promotional campaigns of tourism marketers or in the perceptions of tourists (*e. g.* Middle-Earth New Zealand; Chicagoland), with no specific governance structures backing them up. If regional tourism governance structures exist, they are usually not very powerful at the local levels, where smart tourism has to be implemented. Thus, regional smart tourism most definitely requires

multi-level governance approaches that span various local DMOs. Herrera Priano *et al.* (2016) also stress that smart solutions at the regional level require much higher levels of coordination among a large number of actors and across jurisdictions. The problem is that local constituencies might be affected by tourism to different extents and might also not equally be able to benefit from smart infrastructure developments. As a result, their motivation to become involved in participatory planning and governance initiatives may vary substantially.

Herrera Priano *et al.* (2016: 466) define a smart tourism region as one that «correctly identifies its strengths and opportunities, and that, moreover, properly coordinates the available —and usually limited— resources to yield the maximum productivity of the areas that comprise it». It is clear that this definition only encompasses the governance aspects of smart tourism regions. These are important but not sufficient for a regional understanding of smart tourism. What is missing is a regional-level conceptualization of the pillars/layers of a smart tourism region, from its physical infrastructure to appropriate technological solutions, from the kinds of data it needs and is able to collect to the types of innovations and regional business ecosystems it requires. Its goals need to be formulated from a regional point-of-view, e.g. smart regional mobility instead of urban mobility. Importantly, smart tourism regions need to define what a smart regional tourism experience involves. The smart regional tourism experience requires conceptualization based on not only the experiences that tourists might have at a particular destination, but also taking into account experiences on the way to and from particular destinations within the region. There is therefore much definitional work to be done in order to move the idea of a smart tourism region forward.

5. Conclusion

This paper illustrated that directly applying smart city and smart destination principles to smart tourism regions is dangerous due to the many urban biases inherent in their conceptualizations. Thus, from both a practical as well as theoretical point of view, appropriate translations of smart principles to the regional level are urgently needed as smart tourism development spreads beyond cities. There is a substantial literature on regional development in tourism that should be integrated with the smart tourism literature to inform research and practice regarding smart tourism regions. What is also needed are smartness indicators for the regional level so that development efforts can be appropriately evaluated. In addition, there is a great need for case studies at the regional level to illustrate and compare opportunities as well as challenges that emerge in practice when applying smart tourism principles to regions. Smart tourism regions promise synergies that could not be achieved if developing individual smart destinations. They also have the potential to offer qualitatively different smart tourism experiences. Consequently, it is argued here that there is great value in adopting regional perspectives for smart tourism development and research.

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Section ARTICLES

Journal of Regional Research Investigaciones Regionales

Foundations and relevance of delimiting local tourism destinations

Yurena Rodríguez Rodríguez*, Raúl Hernández Martín**

ABSTRACT: There is an extensive literature on delimiting functional areas for management purposes in the social sciences. Nevertheless, in the field of tourism research there is no established set of criteria for delimiting tourism destinations. However, destinations are considered a main object of analysis and decision-taking for tourism management. This paper discusses the most relevant literature on delimiting functional zones and proposes a methodology for an application in the field of tourism. The research is illustrated with the results on zonification and production of statistical information already obtained by the Canary Islands System of Statistics. The results highlight the relevance of zoning in tourism with the support of the foundations and criteria for delimiting functional areas in the social sciences. Subjectivity is considered to play a crucial role among criteria for delimitation both in tourism and in social sciences in general.

JEL Classification: R12; O32; L83.

Keywords: delimitation; local tourism destinations; functional zones; zoning; tourism micro-destinations.

Fundamentos y relevancia de la delimitación de destinos turísticos locales

RESUMEN: Existe una abundante literatura académica acerca de la delimitación de áreas funcionales con fines de gestión en el ámbito de las ciencias sociales. Sin embargo, en el ámbito de la investigación turística no existen criterios claros para la delimitación de los destinos turísticos. Esto a pesar de que los destinos son considerados un concepto clave como objeto de análisis y para la toma de decisiones en el campo del turismo. Esta investigación se ilustra con los resultados ya alcanzados en la zonificación y producción de información estadística por el Sistema de Estadísticas Turísticas de Canarias. Los resultados ponen de manifiesto la relevancia de la zonificación en el turismo apoyada en los fundamentos y los criterios de la delimitación de áreas funcionales en las ciencias sociales. Los aspectos subjetivos juegan un papel fundamental entre los criterios de delimitación tanto en el turismo como en las ciencias sociales en general.

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Clasificación JEL: R12; O32; L83.

Palabras clave: delimitación; destinos turísticos locales; áreas funcionales; zonificación; microdestinos turísticos.

1. Introduction

This paper is the result of a research problem that is becoming increasingly important in the field of tourism. It involves the measurement of tourism at a local scale to achieve better decision making. The importance of the local area in tourism has been highlighted by researchers as Dredge (1999), Lew and Mckercher (2006) or Pearce (1999, 2001), authors who highlight the importance of local destinations as units of analysis in tourism. In fact, Candela and Figini (2012) consider the tourism destination as the most relevant concept in Tourism Economics.

Tourism is an activity with a high spatial concentration of supply. However, this does not give it a distinctive character with respect to other economic activities. In fact, analyses carried out by the World Travel and Tourism Council-WTTC- (2012) show that the concentration of the supply of tourism activities in the United Kingdom is less than in the case of other activities such as the automobile industry or financial services. What is characteristic and unique to tourism is that a significant part of consumption (not production) is carried out in areas with a high concentration of tourism activities, *i. e.,* tourism destinations, where supply and demand converge in the territory.

In this way, in tourism, not only do businesses compete, so do destinations. Consequently, the management of tourism destinations through DMOs (Destination Management Organizations) is one of the determinants of tourism competitiveness (Candela and Figini, 2012). Therefore, in the current context of competition among advanced countries, increasingly based on innovation and knowledge, the role of statistical information is central to making the right decisions at the right time, both for businesses, for governments and for destinations (Sheehan, Vargas-Sánchez, Presenza and Abbate, 2016). It is in this context of relevance of information linked to a territory that this research is framed. This research aims to contribute to the development of methodologies for the identification and delimitation of tourism destinations at a local scale.

Apart from the report of the UNWTO (2004) in which the importance of delimiting tourism destinations is highlighted and certain premises are given for it, there are practically no studies in the field of tourism in which methodologies are proposed and results provided on the identification and delimitation of tourism destinations on a local scale. The causes of this anomalous lack can be diverse. On the one hand, it could be due to the divergence of interests between academic research and decision makers at the local scale. On the other hand, the development of tourism statistics at an international scale has been very conditioned by a macro vision, at the country

level, which has limited the expansion of statistics at sub-national levels. By contrast, the delimitation of functional areas in the social sciences is a field with over four decades of existence. Following the pioneer contribution of Suttles (1972), delimitation of areas has been further developed with contributions by Flowerdew *et al.* (2007), Coulton *et al.* (2001) or Cutchin *et al.* (2011). These delimitation studies have been an important frame of reference for this research.

As mentioned, the aim of this article is to frame the delimitation of tourism destinations in the broader context of social sciences and to contribute to the development of methodologies to identify tourism areas at a local scale for which useful statistical information can be obtained for decision making. These areas are called micro-destinations or local tourism destinations.

Academic literature on tourism highlights the need for public intervention and private coordination as a way of improving the competitiveness and sustainability of destinations (Candela and Figini, 2012). To do this, it is necessary to have abundant and accurate information about destinations over time. However, there is a significant deficit in information on tourism at a local scale. For example, at present there are no official statistics with internationally agreed methodological criteria on the number of tourists, or even day-trippers, who visit major tourism cities of the world such as New York, Shanghai, London or Paris. Indeed, the lack of information is even greater when it comes to analysing the most popular districts within large tourism cities, even though these areas can receive more tourists than many countries in the world. This statistical deficit is linked to a lack of consensual methodologies to measure tourism at a lower scale to the national level.

At the regional level, the development of tourism statistics has been carried out by some countries that have transferred the methodologies designed for the national scale to the regional scale of analysis. However, difficulties arise when the scope of analysis is local. The recent problems of overtourism in cities such as Venice, Barcelona, Amsterdam or San Francisco highlight the importance of incorporating instruments that regulate the tourist flows to avoid congestion problems generated by tourists and situations of social unrest among residents in the destinations (Postma and Schmuecker, 2017). To be able to regulate more efficiently, it is necessary to have better information, both from traditional statistical information and from new sources of information related to tourist tracking, the use of mobile applications, the analysis of card payments, the use of social networks, etc. These new sources of information can be georeferenced and are of great interest for the analysis of tourism at a local scale.

Our research is related with the activities of the International Network on Regional Economics, Mobility and Tourism (INRouTe and UNWTO, 2014) which has been applied by the Canary Islands Institute of Statistics (ISTAC). Part of the methodology presented in the following sections has been applied with practical results since March 2015, at which time ISTAC began to publish detailed statistical information, from the perspective of supply, for infra-municipal geographic units, which have been named tourism spots and tourism entities. This information has been valued very positively by management organizations of destinations in the Canary Islands.

The next section delves more deeply into the background for this research. After this, we explain the methodology for the identification of tourism micro-destinations based on a consensus of experts, the results obtained for the Canary Islands, and some data from the South of Tenerife. In the last section, some conclusions are highlighted.

2. Delimitation of functional areas in social sciences

Insofar as the purpose of this research is to contribute to the necessary methodological development for the delimitation of local tourism destinations, a journey through studies that have addressed a similar theme, although with other purposes, is illustrative. In the scientific literature on tourism, there are not many studies that identify internally homogeneous areas in terms of certain characteristics, but heterogeneous with respect to adjacent areas. However, in some disciplines of social sciences there is a certain tradition of delimitation of functional geographic areas. These studies have been carried out mainly in the fields of sociology, public health, urban planning, regional science, labour market analysis and geography. They have delimited functional areas in cities, in some cases, districts or neighbourhoods for research purposes. These functional areas have been identified in the literature based on nine main criteria. The most repeated is subjectivity and consensus, both of the authorities and of the local population (Coulton *et al.*, 2001; Flowerdew *et al.*, 2007; Sampson, Raudenbush and Earls, 1997; Suttles, 1972). There has also been delimitation using physical and social barriers (Cutchin *et al.*, 2011; Flowerdew *et al.*, 2007; Sampson *et al.*, 1997; Suttles, 1972), pre-established boundaries (Chaskin, 1997; Suttles, 1972) and the homogeneity of the population or characteristics of households (Flowerdew *et al.*, 2007; Riva, Apparicio, Gauvin and Brodeur, 2008; Sampson *et al.*, 1997; Spielman and Logan, 2013). Additionally, land use (Cutchin *et al.*, 2011; Dredge, 1999; Suttles, 1972) the purposes of the research (Chaskin, 1997; Dredge, 1999; Flowerdew *et al.*, 2007) size (Blasco, Guia and Prats, 2014; Clapp and Wang, 2006; Flowerdew *et al.*, 2007) and spatial continuities (Cutchin *et al.*, 2011; Flowerdew *et al.*, 2007; Sampson *et al.*, 1997) have also been used.

In this field of study, it is important to highlight the contribution of Suttles (1972) with his work: *The social construction of communities*. In this research, the author has a multilevel spatial vision of the neighbourhood, arguing that urban households could identify four neighbourhood scales. The smallest is the «block», defined as the area in which children are allowed to play without supervision. The second level is called the «defended neighbourhood», which is a small area that has a corporate identity. The third level is the «community of limited liability», which is a district of local government agencies in which individuals» social participation is selective and voluntary. Finally, the fourth level, the «extended limited liability community» considers an entire sector of a city. The main objective of Suttles' work was to investigate resident local urban communities in order to enter into the process of community differentiation, though this does not always result in well-defined territorial units. Suttles (1972) considered that the main aspects to take into account when defining the boundaries of

neighbourhoods are that some communities already have their borders well defined because the adjacent communities eschew their residents. Boundaries can also be defined by the presence of conveniently arranged physical barriers (railways, highways, parks and industrial estates) that are considered real obstacles to pedestrian traffic; the price gradient in relation to residential land use; and pre-established borders, that is, arbitrary lines delimited on a map for organizational purposes.

In the literature on defining and delimiting neighbourhoods, there are multiple approaches. Deng (2016) identified six categories in which neighbourhood identification and delineation methods can be grouped: perceptual-based methods, which delineate neighbourhoods based on residents' mental maps; physical limits such as geographic features, streets, etc.; inference based methods; methods that use pre-existing zones, such as census blocks, administrative or electoral districts, municipalities, etc.; methods that take into account aggregate limits; and those that use the automated zone design, through the automation of the neighbourhood delimitation process by means of criteria specified by stakeholders. In this research, we agree with Deng (2016) in highlighting the importance in the literature of the methods based mainly on perception, on pre-existing zones and in the design of automated zones, as well as on the combination of several of these. We also consider methods that focus on different attributes of the local population, households, etc., as well as those that focus on the social relationships that occur in a territory.

Regarding the delimitation methods of neighbourhoods based on attributes, it is worth mentioning the contribution of Galster (2001), who defined the neighbourhood as a set of spatial attributes associated with groupings of residences, sometimes together with other land uses. Similarly, Spielman and Logan (2013) conceptualized neighbourhood in terms of space and social composition, defining it as a contiguous territory characterized by a set of social attributes that distinguish it from the surrounding areas. The authors specified that neighbourhood boundaries are defined by changes in a set of attributes between adjacent territories. Unlike the vast majority of contributions on the delimitation of neighborhoods, these authors considered that neighborhoods are not exclusive, that is, one location could be in several neighborhoods at the same time. Spielman and Logan (2013) defined neighbourhoods based on a core and edges, where the central areas belonged unmistakably to a single thematic unit, but the marginal areas were often associated with multiple thematic units.

Many other neighbourhood delimitation studies put the emphasis on social relations. An example of this is the work of Hipp, Faris and Boessen (2012). These authors created neighbourhoods based on the density of social ties and physical distance among adolescents, obtaining networks that show considerable spatial continuity.

Numerous authors highlighted, when identifying neighbourhoods, the importance of mental maps that are created by neighbours, that is, the subjectivity of individuals. In this sense, Chaskin (1997) considered that neighbourhoods are recognizable and definable, but that the delimitation of their boundaries is a negotiated and imperfect process, and often influenced by political considerations. For the author, neighbourhoods are spatial constructions that give rise to spatial units where

residents share certain circumstances. In his work, the author considered that the boundaries of neighbourhoods are drawn by individuals, how they move and relate to their environment, and mental maps that they build from this. The construction of these mental maps is influenced by different aspects, such as the physical elements of the city, roads built (streets, public transport routes, etc.), and physical barriers (walls, viaducts, rivers); and social and functional elements (demography, presence of important institutions, perception of safety or risk, and relative location and functional opportunities). According to the author, the construction of these boundaries depends on the degree of importance that each individual gives to the characteristics that define the neighborhood. Chaskin (1997) identifies four particularly important dimensions: the neighborhood as a spatial unit where multiple activities occur; the neighborhood as a set of social relationships; the neighborhood defined by its relation to one or more activities; and the neighborhood as a symbolic unit with a name and a recognized identity.

Different studies compare the neighbourhoods identified using individuals' subjectivity or mental maps with other areas generated automatically by computer software used in certain methodologies. Haynes, Daras, Reading and Jones (2007) compared 101 areas designed automatically by technicians of Bristol City Hall (England) with those resulting from residents' subjectivity. In 1994, the Planning Department of Bristol City Council divided the city into 101 small areas, which after many consultations were agreed to be the ones that best represented local communities. These areas were the result of adding several census districts, so that they should optimize the homogeneity of social and environmental characteristics, meeting a minimum population threshold. The authors affirmed that although the automated design of zones is apparently objective, in reality, each new delimited zone is the result of the application of a set of criteria specified by the researcher, so, far from defining an optimal set of neighbourhoods, this method offers an infinite number of possibilities. This work concluded that areas generated by means of computer programming can approximate, once the appropriate rules have been identified, to those resulting from the application of local knowledge and consultation.

Another study that identified neighbourhoods automatically was carried out by Clapp and Wang (2006), within the framework of research in real estate markets. In this study, the authors defined neighbourhoods as geographic areas that contained similar populations and real estate markets with a certain degree of homogeneity. They identified the optimal number of neighbourhoods through a hedonic model that used information related to individual home sales transactions and the addresses of these dwellings. The researchers applied Goodman's (1981) submarkets identification criteria to the case of neighbourhood delimitation. These criteria are homogeneity, similarity in some important dimension such as housing and/or demographic characteristics; parsimony, in a given area the least number of possible neighbourhoods is preferred; and contiguity.

Similarly, Cutchin *et al.* (2011) used a theoretically informed combination of qualitative geographic information system (GIS) and field observations to estimate

neighbourhood boundaries in Texas City, using an innovative methodology to address this problem, called the socio-spatial neighbourhood estimation (SNEM) method. They found that the SNEM approach to operationalization could improve neighbourhood-based inferences.

The literature gathers a variety of works that use pre-existing zones for the creation of new neighbourhoods. An example of this is the work of Riva *et al.* (2008), who evaluated the strength of census districts as units of analysis in the field of public health, more specifically in the measurement of the potential of an active life. These areas should be homogeneous with respect to socioeconomic conditions but heterogeneous with respect to other environmental characteristics. Based on the data available at the lowest level of the census area, homogenous zones were designed using three indicators of active life potential, that is, population density, land use mix and accessibility to services. These zones were the result of the grouping of census areas into seven groups or types of environment.

In this context, Coulton *et al.* (2001) identified neighbourhood units based on maps drawn by residents, and compared the results with census definitions of the neighbourhood. This study found that investigations based solely on the neighbourhoods defined by a census may underestimate the effects of neighbourhoods, since the actual conditions affecting residents are not accurately represented within the census boundaries.

The academic literature realizes that the definition and identification of neighbourhoods must take into account multiple factors. In this sense, Milbrath and DeGuzman (2015), who analysed the evolution of the neighbourhood concept from the perspective of public health research, pointed out that to identify neighbourhoods, an integrated approach must be adopted that takes into account geographic characteristics, political influences, interactions and the group identity.

As with this research, in many studies, neighbourhoods are defined for statistical purposes. This is the case of Flowerdew *et al.* (2007), who built a zonal system for the publication of statistics on a neighbourhood scale in Scotland. For the construction of these zones, they used the following criteria: population size, compactness of their form, homogeneity of the population in terms of social and economic variables, and elements of the physical and social environment that can affect the degree of significance of a zone for the local population. The need for human intervention was highlighted given the subjective nature of the areas to be identified. In this work, a consultation process was carried out, where the opinion of the local authorities was taken into account. The consultation consisted of sending a draft of the zones identified to the authorities for comments and suggestions. These authorities proposed specific changes, some important, sometimes suggesting their own areas. Subsequently, changes that did not infringe the principles used were incorporated.

In regional science, the delimitation of functional and administrative areas has also been common. In this sense, Coombes (2014) defines policy boundaries in England at the city-region scale for governance purposes. Other researches approach regionalization problems using spatial optimization techniques. They build regions by combining

small areas that share common characteristics with predefined functional centres that have tight connections among themselves through spatial interaction (Kim, Chun and Kim, 2015; K. Kim, Dean, Kim and Chun, 2016). Dusek (2005) analysed the problem of the unit of equivalent area (MAUP). This problem is related to all the results of the quantitative methods being potentially influenced by the mode of spatial delimitation. His work presents the epistemological background of the problem and gives examples of the negative consequences of ignoring them in the regional macroeconomy.

Cörvers, Hensen and Bongaerts (2009) tests if functional regions in the Netherlands show more labour market coherence between the municipalities included in them than the Dutch administrative regions, and it turns out that regional disparities are not significantly smaller within functional than within administrative regions with respect to income level, housing prices, employment rate, and unemployment rate.

Within the literature on delimitation of functional areas in the labour market it should be highlighted that dedicated to the identification of Travel-to-Work Areas, these areas are defined so that most jobs are filled by residents of that area and most of the resident working population work in the area (Ball, 1980; Casado-Díaz, 2000; Coombes, Green and Openshaw, 1986; Coombes and Openshaw, 1982; Franconi, Ichim and D'Aló, 2017; Martin, Gale, Cockings and Harfoot, 2018; Papps and Newell, 2002; Soares, Figueiredo and Vala, 2017).

Despite the central role played by tourism destinations in tourism analysis and policy, there are few initiatives of zoning in the literature related to tourism. In this sense, it is worth highlighting the contributions of Dredge (1999), who deals with the spatial design of tourism destinations; Vasiliadis and Kobotis (1999), who analyse the grouping of tourist attractions in Macedonia; and Chhetri and Arrowsmith (2008), who identify areas with high recreational potential in Australia.

More generally, Dredge (1999) addressed the spatial design of destinations and tried to improve the conceptualization of the basic elements of destination regions by modelling existing concepts. This work integrated tourism into land use planning. This work was carried out at a local or regional scale, unlike the planning of market-oriented tourism that is usually carried out at a regional or higher scale. Dredge proposed a spatial model for the planning and design of destination regions, and intended it to be applicable to different destinations and scales. This planning and design model is composed of a destination region, source markets, nodes, districts, circulation routes and gateways.

On the other hand, Vasiliadis and Kobotis (1999) applied an analysis of nearest neighbours to analyse the grouping of tourist attractions in Macedonia. They developed a methodology for identifying geographic areas of potential tourism development. This methodology involved the analysis of the distribution of geographic space through an analysis of the nearest neighbour and an analysis of points through functional diagrams that deepened tourism strategies. This involved the combination of tourism products at chosen points with characteristics of visitors' attitudes that constituted a useful and easy way to gather information to facilitate administrative matters. The case study carried out by Vasiliadis y Kobotis (1999) showed how a

careful evaluation of the links between different locations in Prespes identified key places in the development of specific forms of tourism, as well as highlighting the nature of links between access routes, tourism activities and the tourism infrastructures. Therefore, he concluded that the nearest neighbour analysis could serve to give a better understanding of the nature of tourism areas, as well as provide subsequent help in planning a better use of those areas.

Another zoning work in tourism was carried out by Chhetri and Arrowsmith (2008), who identified areas with high recreational potential in Victoria (Australia) using geographic information systems (GIS). They stored geometrical properties within the GIS, including position, size (width, length and perimeter), the shape and structure of the recreational features. The topological properties provided information on continuity, adjacency, connectivity and containment. The GIS allowed the data to be processed for the geostatistical analysis through which several statistical and mathematical operations could be applied, both to spatial data and to data stored in the database.

Finally, Blasco *et al.* (2014) proposed a method to identify alternative tourism areas based on consumption. This method combined geographic information systems with hierarchical clustering techniques, based on space-time distance in the Pyrenees. With the proposed method, larger areas were divided into small local tourism destinations, which might otherwise be difficult to detect. It is argued that these smaller areas have a range of distances within a destination, which, in the context of the development of tourism in mountain regions, are better adapted to the mobility pattern of the hub-and-spoke. The authors used hierarchical cluster analysis to identify tourism areas within a region, following mobility patterns and distances to attractions. This cluster analysis grouped the attractions of the region into zones where the attractions within an area were maximally close to each other and minimally close to the attraction of other areas. In addition, when dealing with spatial data, it is essential to take into account geographical information system (GIS) techniques. Within GIS, there are multiple ways to perform cluster analysis of spatial data. These applications have certain limitations for the purposes of investigation. Therefore, it was decided to carry out a geographical cluster analysis with a statistical package. The results of this analysis were introduced into a GIS to generate a graphic representation of the resulting tourism zones. As a result, the region was restructured into nine new tourism zones. These areas were more uniform and with a higher correlation index between the attractiveness and intensity of the accommodation. They also have different levels of cross-boundary intensity and are very similar to the existing historical regions. The more they differ from the original destinations, the greater their attractiveness, which supported the effectiveness of the new zoning technique.

The analysis of the vast literature related to the identification of functional areas in social sciences, and the scarce precedents in tourism, has contributed great value and knowledge to the design of the methodology and criteria for the identification of tourism micro-destinations or local tourism destinations in this research. This methodology is detailed in the following section.

3. Identification of tourism micro-destinations based on expert consensus supported by criteria

The first step to be carried out for the identification of tourism micro-destinations is to establish a series of criteria by which to group establishments of industries characteristic of tourism, in such a way that the resulting functional areas are internally homogenous. These criteria will be applied based on the consensus of experts in tourism with explicit knowledge about the destination in which they are working.

The criteria proposed in our study have been developed within a joint research between the University of La Laguna and the Canary Islands Institute of Statistics (Hernández-Martín *et al.*, 2016). These criteria are:

1. *Concentration of establishments from tourism characteristic activities*. This criterion will allow us to separate tourism areas from non-tourism areas, that is to say, zones of high tourism concentration from those of low tourism concentration. This criterion can be applied by focusing on one or several characteristic tourism industries. In addition, areas of high concentration of tourism accommodation establishments can be identified or, similarly, the places visited by tourists (restaurants, beaches, parks, etc.), taking into account that tourism accommodation establishments tend to be concentrated around the attractions and other places visited by tourists.

Using tourism accommodation establishments to delimit tourism micro-destinations implies several advantages and some disadvantages. Among its advantages is:

— Most countries and regions collect statistical information on accommodation establishments (overnight stays, average stay, daily rate, etc.), so this information can be quickly linked to the territory, and thus to micro-destinations.
— Accommodation establishments can be geolocated in a simple way, and with this, it is easy to geolocate the statistical information related to each establishment. Not only the information related to establishments (supply information), but also the information that can be obtained at the scale of each tourist (demand information), if upon obtaining this information it is linked to the establishment where the visitor is staying.
— Even if tourists have high mobility, once they are in the destination, accommodation is a good starting point from which to analyse their mobility, since it is the origin and end of their excursions.
— Tourism accommodation establishments are used by the most important segment of tourists, except those who stay in the homes of family and friends.
— Accommodation represents an important part of the expense that tourists make in the destination.
— Tourism accommodation establishments are often close to tourist attractions, restaurants, and other tourism resources. Therefore, when using them to delimit the micro-destinations, the remaining characteristic tourism industries are not ignored.
— The supply of accommodation is stable over time, which contributes to the stability of the boundaries of micro-destinations.

— The characteristics of accommodation establishments (size, categories, seniority, etc.) are closely related to the tourism activities carried out and the consumption patterns of the tourists.

For all the above, this study has opted for regulated accommodation establishments (which in the case of the Canary Islands does not include holiday homes). If there are areas devoted to other tourism services such as restaurants or leisure attractions (for example, golf courses, or theme parks) adjacent to accommodation areas, these have been included within the boundaries of the micro-destination.

The choice of accommodation as a key activity when defining local tourism destinations has some disadvantages. The main problem detected is that it does not take into account day-trippers and cruise passengers, since they do not spend the night in tourism accommodation in the destination.

2. *Homogeneity of tourism supply characteristics*. To divide a tourism area into more than one micro-destination, the criterion of homogeneity of tourism supply characteristics is used. Firms located in a geographical area have similar values, rules and languages, so they form a homogenous social environment (Scott, Baggio and Cooper, 2011). For example, one area may be specialized in family tourism while the other is in sports tourism.

When delimiting tourism micro-destinations, different elements must be taken into account, such as the characteristics of the tourism accommodation supply (category, size, age, construction model, presence of second residences, prices, profitability, degree of occupation, etc.), the distance to the main tourism resources, or the degree of combination with residential uses, among other aspects.

The boundaries of micro-destinations can be established using the characteristics of supply, demand or even a combination of both. In this research, we have chosen to use the characteristics of tourism supply to identify these local tourism destinations, given that they are less changeable over time than those of demand and, in a way, both are correlated. It remains for future research to enrich the results of this study with the use of demand variables in the delimitation.

3. *Stability of boundaries over time.* The boundaries of micro-destinations must be as stable as possible over time. For this reason, we have chosen to use the characteristics of the supply to delimit them, given that the supply changes more slowly than the demand, although they are related.
4. *Dynamism and flexibility*. Although the boundaries of micro-destinations must be stable over time, at the same time, they must be dynamic and flexible in order to cover possible future tourism developments beyond their boundaries. A tourism destination is a dynamic system that changes over time and passes through different phases (Scott *et al.*, 2011). Thus, the design of micro-destinations and the criteria used to do so must be dynamic and flexible enough to account for these changes, and allow the organizations that generate tourism statistics to recalculate, from time to time, published statistical information.

5. *Feasibility and relevance*. The identification of tourism micro-destinations should be a viable process. That is, it must take into account aspects, such as respecting statistical confidentiality and statistical significance of the data available at this level. The delimitation of the mentioned functional areas should be carried out only in the cases in which the tourism information obtained is sufficiently large to compensate for the effort made. Many times, the data obtained at the municipal level are more than sufficient for the realization of certain projects.
6. *Public and private support*. The purpose of the delimitation of tourism micro-destinations is to help the public and private sectors make better decisions in tourism. For this reason, both public and private agents have to be satisfied with the delimitation. If these agents consider that the resulting areas do not approach the reality they perceive, the effort put into their identification will have been in vain. This support can increase if the boundaries of micro-destinations are coherent with urban and territorial planning, and if they are sensitive to social and environmental interests (Coulton *et al.*, 2001, Sampson *et al.*, 1997, Suttles, 1972).

The above criteria must be applied in a sequential process consisting of three phases. First, criterion 1 must be applied: The concentration of establishments from tourism characteristic activities. This criterion will differentiate tourism areas from the non-tourism ones, that is to say, the zones of high density tourism activity from the low ones.

In a second phase, criterion 2 is applied: Homogeneity of tourism supply characteristics. The application of this criterion will identify the boundaries of the micro-destinations. Each of the tourism areas identified by applying the concentration criterion (criterion 1) may contain one or more micro-destinations. In the second case, an area of high tourism concentration will be divided into more than one relevant, viable and differentiated micro-destination.

To conclude, in a third phase, it is checked whether the micro-destinations obtained after applying the concentration and homogeneity criteria meet the requirements imposed by the remaining four criteria: stability; dynamism and flexibility; viability and relevance; and public and private support. If they do not comply, the process will have to be reviewed.

The application of the criteria described in this section has been made through the consensus of experts. This methodology seeks to delimit tourism micro-destinations according to the criteria of experts who know well the tourism destination in which they are working. These experts must rely on the relevance of statistical information that helps them make informed decisions about the boundaries of these new functional areas. This consensus has solid foundations in the prior knowledge of these experts to give rise to new robust functional areas, which have the support of an important part of the tourism sector, and which has been involved in their identification.

Once the micro-destinations are identified and delimited, the next step is to link the statistical information to each of them. For this, it is necessary to previously geolocate the tourism establishments and likewise the statistical information linked to them. In

the case of using tourism accommodation establishments as the central type of tourism activity in this process, the first step will be to develop a *Directory of Tourism Accommodation Establishments*. This directory must contain all the accommodation establishments of the tourism region under study, which must be geolocated. This directory is the basis of a *Tourism Statistics System* consisting of information from surveys conducted on tourism supply and demand. The fact that the directory is geolocated allows the easy geolocation of all the statistical information of this system. Once you have the statistical information linked to each tourism establishment, it is possible to add it to the scale of tourism micro-destinations, and to determine total and average values for each of these functional areas. Therefore, obtaining information at the scale of tourism micro-destinations does not imply generating new surveys and statistical operations, but regrouping the existing information, with the help of the geolocation of the establishments. This allows us to affirm that generating information for tourism micro-destinations is not costly in economic terms, since it uses existing information, links it to the territory and regroups it. This is particularly true in territories that already have well-developed tourism statistics with census operations or with large samples.

3.1. Application of the methodology in the Canary Islands

For the delimitation of local tourism destinations in the Canary Islands, first, previous works that identify the tourism areas of the archipelago were examined. Subsequently, the criteria detailed above have been applied to identify the different micro-destinations within the tourism areas of the Canary Islands.

To continue with the process, the Directory of Tourism Accommodation Establishments of ISTAC was georeferenced. In addition, each accommodation establishment was assigned information related to different statistical operations carried out by ISTAC, that is, information from the Hotel and Apartments Tourism Accommodation Surveys, Tourism Expenditure Survey and others.

Once the geographic information system for the Canary Islands accommodation establishments was created, the criteria designed in the methodology were applied.

Application of criterion 1: Concentration of establishments from tourism characteristic activities. The delimited micro-destinations are areas with a high density of tourism activities that include a wide variety of establishments from tourism characteristic activities. However, in the case of the Canary Islands, more attention has been given to accommodation establishments for the definition of the boundaries of micro-destinations. If an area dedicated to catering or other places of leisure was right next to a lodging area, it will be included within the limits of the micro-destination. The indicative criterion was at least 1,000 tourism beds.

Using the accommodation as the main activity when defining tourism micro-destinations, despite the advantages listed above, has certain limitations. It implies that day-trippers are not taken into account in this process. Fortunately, the number of visitors who do not spend the night, compared to those who do, is very low in

tourism areas of the Canary Islands, so not considering them does not affect the final delimitation of micro-destinations. The situation may be different in those cities with ports where cruise ships dock, with rural and nature tourism, etc.

Application of criterion 2: Homogeneity of tourism supply characteristics. To divide areas of high concentration of tourism establishments into more than one micro-destination, if any, we chose a supply approach, given that the information on the supply is more stable, and is closely related to demand behaviour. For this, characteristics of the tourism supply in general and accommodation in particular have been used.

At this point, the research team, together with ISTAC, developed a proposal for the delimitation of areas that, under the criteria of the group, and the statistical indicators consulted, were homogeneous. In order to determine this homogeneity, special attention has been given to the age, the construction model, the typology and the category of establishments.

This delimitation was also carried out in order to meet criteria 3, 4 and 5, that is, the resulting micro-destinations are:

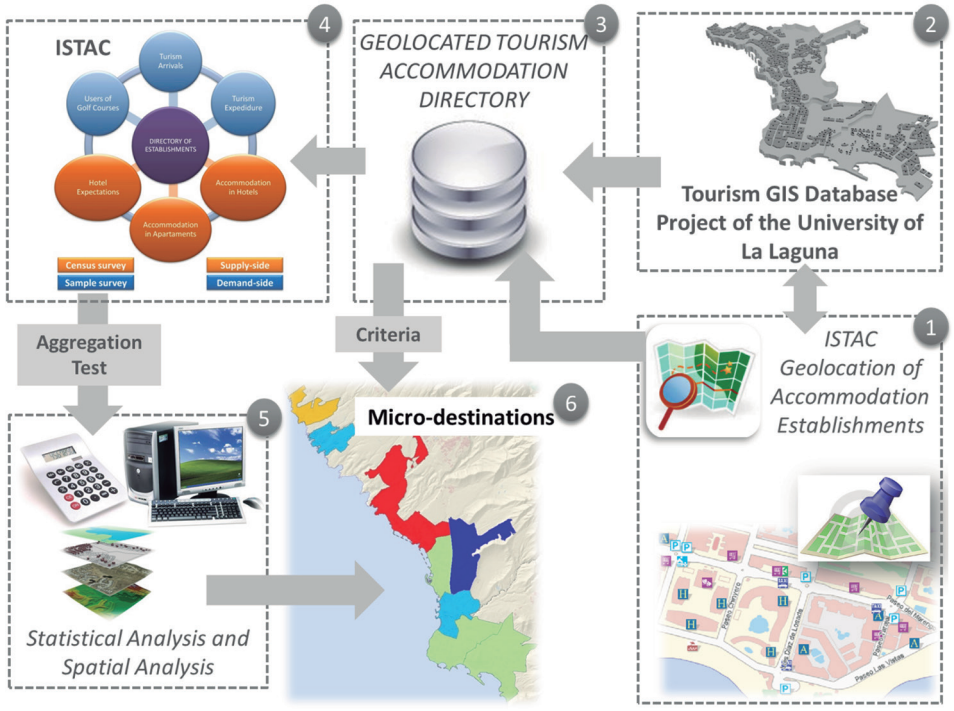
— *Stable*. The established boundaries correspond to the tourism development of the Canary Islands in the last 50 years, and there is no evidence that drastic changes will be produced in these boundaries in the coming decades.
— *Dynamic and flexible*. Despite having established micro-destinations with stable boundaries, they are flexible enough to allow variations in the event of new tourism developments. Recalculating the data in case of variation in the boundaries of the micro-destinations is a simple process.
— *Feasible and relevant*. The number of zones is manageable from the point of view of destination management, while the areas are large enough to respect statistical confidentiality.

Application of criterion 6: Public and private support. The initial proposal for the delimitation of tourism micro-destinations was sent to tourism officials on the islands, belonging to institutions such as *Turismo de Tenerife*, the Gran Canaria Tourism Board, the Lanzarote Data Centre, the Fuerteventura Tourism Board and the Canary Islands Tourism Board (*Promotur*). These officials, in general, were quite in agreement with the first delimitation. In some cases, they made proposals to divide some identified areas into more areas, since they contained different types of accommodation. This was the case, for example, of the tourism areas in San Bartolome de Tirajana or Puerto de la Cruz. In San Bartolomé de Tirajana a micro-destination had initially been identified that encompassed Sonnenland and Campo Internacional. The Tourism Board of Gran Canaria recommended that these two zones had entities and establishments sufficiently differentiated to form two micro-destinations. In Puerto de la Cruz, a single micro-destination had been delimited, which *Turismo de Tenerife* recommended dividing into four, given the heterogeneity of its accommodation offer. On other occasions, tourism officials simply proposed to move a boundary to one side or another, since one micro-destination was not being separated from the other at the most appropriate place. This was the case of Puerto del Carmen (Lanzarote), where they recommended moving a line to avoid dividing the old town.

The literature consulted on the delimitation of functional areas, states that perception, mental maps, local knowledge and consultation with the agents involved are very useful criteria used in the identification of these areas (Chaskin, 1997; Deng, 2016; Haynes *et al.*, 2007; Suttles, 1972). That is why the recommendations of experts from each island were incorporated into the initial proposal, which was enriched with their specific knowledge about their area of action. This step, in addition, allowed those responsible for tourism management on each island to get to know the project and get involved in it, in order to have their support and improve the future usefulness of the identified units.

To conclude, the methodology used for the delimitation of local tourism destinations in the Canary Islands can be summarized by the following scheme (Figure 1).

Figure 1. Methodological Scheme



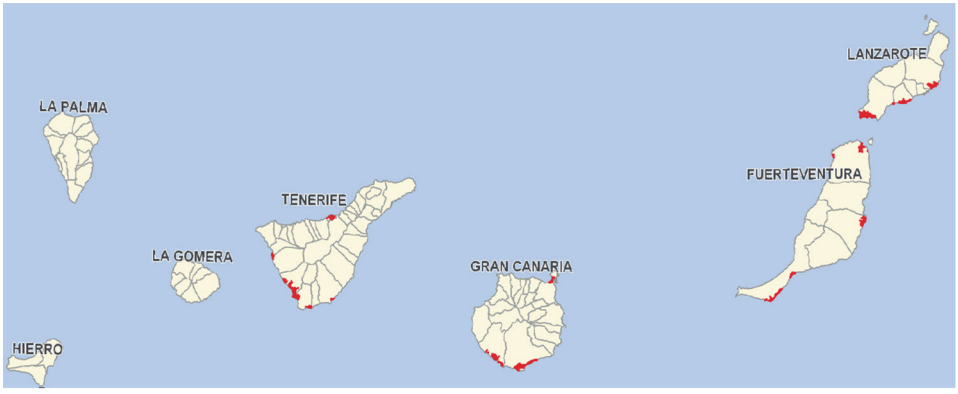
(1) Starting with the Directory of Tourism Accommodation Establishments of ISTAC, which we georeferenced. (2) A Geographical Information System was built to apply the criteria for the identification and delimitation of micro-destinations (3). The information of the Tourism Statistics System of ISTAC is assigned to each establishment (4). The information is added and the appropriate tests are carried out to check for reliability and ensure statistical confidentiality is respected (5). After this process, a large number of statistical indicators are obtained at the scale of tourism micro-destinations.

In step 5 of the methodological scheme (Figure 1), where the information is added at the scale of tourism micro-destinations, the sample sizes of each micro-destination must be taken into account so that the indicators generated at this level are reliable. In the case of supply surveys, given their census nature (they are carried out on all tourism accommodation establishments in the Canary Islands), geolocation allows the use of direct estimators for each micro-destination, without the need to use estimation methods for small areas. However, to provide demand statistics, compiled from a sample, it is necessary to analyse the mean square error of the direct estimators for micro-destinations (Rao and Molina, 2015). This test allows you to decide when to use direct estimators and when to use small area estimators.

4. Results

After the application of the methodology based on the consensus of experts, 47 tourism micro-destinations were identified in the Canary Islands, which are the shaded areas in red that can be seen on the islands' coastlines in Figure 2. For these geographic units, the Canary Islands Statistics Institute (ISTAC) has published, since March 2015, statistical information from the supply side (number of establishments, places, employment and profitability indicators, employment figures and tourism population). This delimitation will also allow, in the future, to offer data from the demand side (profiles of tourists, characteristics of their trips, satisfaction and levels of expenditure), based on the information from the Tourism Expenditure Survey. In La Palma, La Gomera and El Hierro it was not possible to identify these functional units, given that their tourism spots do not reach sufficient numbers to allow data published on this scale to be sufficiently robust and respect statistical confidentiality.

Figure 2. Tourism micro-destinations in the Canary Islands



Source: Canary Islands Institute of Statistics. ISTAC.

These 47 micro-destinations are grouped, in turn, into 16 tourism entities that despite only representing approximately 1.7% of the surface area of the archipelago,

account for around 92% of tourism accommodation places offered and 93% of overnight stays (2016 data). The entities are characterized by spatial continuity except in four cases: Corralejo - El Cotillo, Mogán Turístico, Adeje Turístico and Abona, where spatially separated micro-destinations are grouped.

In the case of the Canary Islands, as explained above, the criteria used for the delimitation of tourism micro-destinations have been applied based on expert consensus based on criteria. The project was presented to town councils, management boards, and other competent bodies on tourism in each island, and a delimitation proposal was sent to them, and they (based on their knowledge, existing indicators and extensive experience in the field) proposed changes that they considered appropriate. This knowledge, supported by indicators, spatial plans of each municipality, and other regulations and tourism plans, led to the identification of the current 47 micro-destinations.

For these 47 micro-destinations, after applying the methodology explained above, tourism information is obtained that is very relevant from the perspective of supply and demand. Below are some indicators by tourism micro-destinations for the case of the municipalities of Adeje and Arona, in the south of Tenerife.

After identifying and delimiting the tourism micro-destinations in the Canary Islands, and adding the information from the Canary Islands Statistics System, developed by ISTAC, a large amount of information is obtained for each of them. As an example of results obtained for each tourism micro-destination, data will be shown for the tourism municipalities of Adeje and Arona, in the south of Tenerife. These municipalities are, together with San Bartolomé de Tirajana in Gran Canaria, the most important in the Canary Islands in terms of tourism. According to the Tourism Accommodation Survey of ISTAC for 2017, both municipalities contained 22% of the accommodation beds in the Canary Islands and generated 23% of the overnight stays in hotels and apartments.

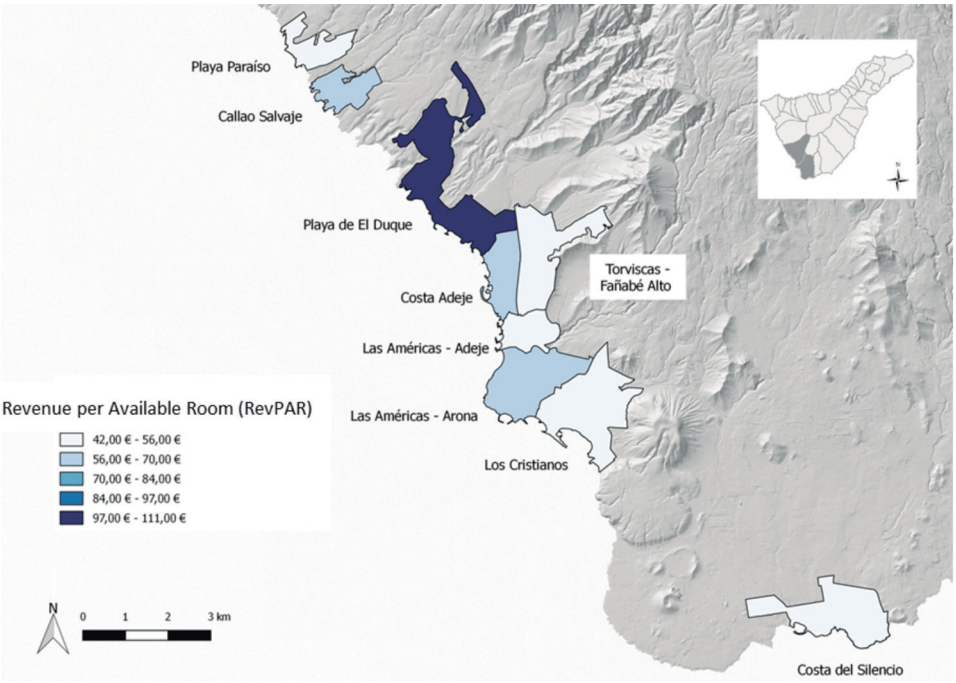
In the municipalities of Adeje and Arona (in the south of Tenerife), nine tourism micro-destinations have been delimited. From left to right these micro-destinations are: *Callao Salvaje, Playa Paraíso, Playa de El Duque, Costa Adeje, Torviscas and Fañabé Alto, Las Americas - Adeje, Las Americas - Arona, Los Cristianos and Costa del Silencio*, as shown in Map 1.

From the application of the methodology designed for this research, ISTAC has published information at the scale of tourism micro-destinations since 2015. Currently, only data obtained from their surveys of tourism accommodation in hotels and tourism apartments are published. Through this publication, annual data from 2009 to 2015 of the following tourism indicators at the level of tourism micro-destinations can be known: number of establishments open, beds offered, overnight stays, travellers, average stay, occupancy rates, average daily rates, income per available room, number of jobs and tourism population. It is expected that information on the demand side (based in tourist surveys) is going to be also released soon.

The statistical data obtained for these nine micro-destinations in the south of Tenerife allow us to affirm that each of the resulting units presents sufficient differential char-

acteristics that justify the production of specific tourism information at this new scale. There are relevant differences regarding the age and type of establishment that each zone contains. For example, it was found that the three oldest micro-destinations - Los Cristianos, Costa del Silencio and Las Américas-Adeje, together with the areas of Torviscas - Fañabé Alto and Callao Salvaje, contain a considerable number of apartments, while the four remaining micro-destinations showed a greater proportion of hotel beds.

Map 1. RevPAR of hotels and apartments according to the tourism micro-destinations of Adeje and Arona. 2015



Source: Tourism accommodation survey. ISTAC.

There is a significant difference between the nine micro-destinations with respect to the presence of homes and second residences within their boundaries. Four of the micro-destinations include a significant number of permanent residents, while the other five have very few residents. The quality of the tourism accommodation, the provision of services and public spaces in the destination are variables that are related to the prices and profitability of each area. In map 1, information on Revenues per Available Room (RevPAR) in hotels and apartments is shown. This information allows us to verify that RevPAR in certain micro-destinations (Playa del Duque) is double that of others (Playa Paraíso or Torviscas-Fañabé Alto).

The relevance of dividing the municipalities of Arona and Adeje into several micro-destinations is revealed when observing the data provided by the ISTAC on

the average daily income (ADR) of the hotels: in Playa del Duque the ADR reaches € 122, while that in Torviscas-Fañabé Alto is € 50. In other words, in Playa del Duque, the ADR reaches more than double the value of the cheapest area within the same municipality. This implies that the value of ADR for the municipality of Adeje (€ 78) is not a good indicator of what is happening in the municipality, due to the high variance of results among the different micro-destinations. Differences are also observed among local tourism destinations in hotel occupancy rates, apartment occupancy rates, the average stay of the tourists, tourism expenditure on each concept (car rental, restaurants, etc.), the presence of children, the number of previous visits, the level of satisfaction with the trip or the use of all-inclusive offers. In addition, the distribution of tourists according to their nationalities does not follow a regular pattern throughout the nine micro-destinations. The United Kingdom is the main country of origin for the south of Tenerife and, when the figures are compared, the proportion of British tourists in some micro-destinations is clearly higher than in others.

5. Conclusions

The academic literature of several research fields shows us that the delimitation of the boundaries of social communities is not a simple process. The criteria used in many papers to establish these boundaries are very diverse, and currently there is no consensus on a universal method. Identifying such community boundaries can arise as a result of general needs, or in response to a set of particular interests, as is the case in this article, the analysis of tourism. The problems faced in trying to establish the destination boundaries at the local scale are very similar to those faced in any other field of research, the main difference being the social dimension. Neighborhoods tend to have clearer, stronger and more stable social relationships than those of tourism micro-destinations, since their residents are stable; however, the experience of neighborhoods has been very useful for the delimitation of destinations. It is worth noting that the criterion of subjectivity of stakeholders has proved to be useful for enriching the results of the delimitation in tourism as very often seen in other cases of functional zoning.

The method proposed in this article to identify the boundaries of tourism micro-destinations contains six criteria that were applied to the Canary Islands. In particular, three of these criteria played a crucial role: the first was the concentration of tourism establishments (to separate the tourism areas from those areas that do not depend largely on tourism); the second, the types and characteristics of the tourism supply (to distinguish one micro-destination from another); and finally, the sixth, public and private support (a criterion that ensures the usefulness of the information obtained for policy purposes). These results can be seen as a contribution to the definition of a standardized international methodology to delimit tourism destinations at a local scale and to provide statistical information for these analytical units. As in most of the literature on functional zoning in social sciences, subjectivity and expert consensus has played a crucial role in the delimitation of areas given that the results of pure statistical methodologies usually failed to provide consistent results.

In the project, accommodation establishments have been used to identify the limits of micro-destinations. There are several advantages of using them as a starting point, which is why they have played such a central role in the methodology developed in this research. In addition to facilitating the geolocation of tourists, they also provide researchers with access to large amounts of statistical information, which is linked and available for accommodation establishments that can also be geolocated. Therefore, the results provide an example of the potential of this methodology, even when only available information is used. The combination of survey information on the demand and supply side would be a future result of this research.

The application of this method in the Canary Islands has been possible given the quality and availability of tourism statistics. It has not involved extra costs since it is based on existing information from the Tourism Accommodation Surveys and the Tourism Expenditure Survey, which has been reorganised with the help of geolocation. In addition, the results can be extended to obtain time series of data for micro-destinations.

The proposed methodology can be applied to any type of region, but it is particularly suitable for places with a high concentration of tourism establishments, as is usually found in coastal destinations for mass tourism. When applying this methodology to other types of tourism regions, the characteristics, objectives and needs of each destination must be taken into account. The particular methodological decisions taken in the case of the Canary Islands (especially the use of accommodation as a cornerstone) may not necessarily coincide with the characteristics of all urban or rural tourism destinations, or those destinations that depend on cruise passengers or day-trippers. In places where accommodation facilities are scattered or may not play a central role in tourism, the method used in this document should be adapted accordingly. In such circumstances, micro-destinations should be delimited according to the concentration of other types of tourism establishments, such as the places most visited by tourists, instead of using accommodation establishments as a starting point, with the support of expert consensus. However, it should be noted that if there is a total lack of concentration of tourism establishments or tourism activity in a specific geographical area, then it makes no sense to try to establish micro-destinations, and therefore it would not make sense to try to use this methodology.

The use of georeferenced information opens up great possibilities in the analysis of local tourism destinations. Both tourism accommodation and the places visited by tourists are very important in the management and planning of tourism, as it provides information on the mobility of tourists. In addition to analysing mobility, possible future extensions of this methodology could involve the expansion of the statistical system by adding geolocation (when available) related to expenditure, environmental indicators, labour statistics, or even real-time data on the consumption of electricity, traffic, public transport, etc. With the aim of improving the decisions taken by destination management organizations and stakeholders, delimitation of reliable and consensued local destinations should play a very relevant role.

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