

SMART TOURISM. A STUDY ON SYSTEMATIC MAPPING

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The emergence of the Internet and information and communication technologies (ICTs) has generated a revolution of the tourism industry (Buhalis and Law, 2008), modifying the way in which tourism products and services are distributed (Werthner and Klein, 1999), and the structure and strategy of the business (Porter, 2001). In the same way, the behaviour of tourists has modified thanks to their empowerment through ICTs. Now they have become both producers and consumers of experiences through the use of social networks and the different Web 2.0 platforms (Buhalis and Licata, 2002). Tourists are now hyper-connected and multichannel. They stay connected to their mobile devices and use TICs in all of the stages of their trip (Zheng Xiang, Magnini, and Fesenmaier, 2015; Buhalis and Foerste, 2014). In short, a new tourism scenario has emerged which must be adapted to.

Within this context, destinations are faced with important challenges. Basically, the need to understand that the traditional way of offering and designing services and products has changed (Ivars-Baidal, Celdrán-Bernabeu and Vera-Rebollo, 2017). Now, the digital tourist consumes and generates experiences thanks to co-creation processes which are supported by social networks, apps, inspiring videos, forums, online sales platforms or blogs, etc. (Buhalis and Amaranggana, 2015; Neuhofer, Buhalis, and Ladkin, 2015). In order to confront these conditioning factors, both destinations and tourism companies must implement permeable and modular action strategies by applying updated management approaches that are in tune with the evolution of traditional tourism towards new stages where technology is a dominant factor. Today, we talk about Smart Tourism Destinations, which make intensive use of sensors, mobile technologies and technologies such as Big Data or the Internet of Things (IoT), in order to improve the tourist experience and the management of the dominant destination (Ivars-Baidal, Celdrán-Bernabeu, Mazón, and Perles-Ivars, 2017; Ivars-Baidal, Solsona Monzonís, and Giner Sánchez, 2016); López de Ávila and García, 2015; Luque, Zayas and Caro, 2015).

In the mid-1990s, the need to establish limits to the models of urbanisation and generate more sustainable cities (United Nations, 2014; ONU-Habitat, 2016), converted urban areas into pioneers in terms of adopting these new paradigms of urban planning and management which incorporated technology as a key element (Caragliu, Del Bo, and Nijkamp, 2011; Pierce, Ricciardi, and Zardini, 2017). The objective was to respond to the social, economic and environmental problems of the cities (Moreno, 2015). We are talking about the Smart City approach, which has been very well received as it is identified as being the solution to the problems of the cities of the twenty-first century (Fernández, 2015; Komninos and Tsarchopoulos, 2013). The Smart City places particular interest in the application of new technologies as an essential pivotal element for improving the quality of life and the social, economic and environmental conditions of urban areas, thanks to its application in infrastructure management (Guo, Liu, and Chai, 2014; IBM, 2010; Komninos, Schaffers, and Pallot, 2011; PwC and School, 2015). Although the Smart City approach was initially based on an excessively technological concept, now we are seeing a change in direction dominated by new variables related to the quality of life, economic development and innovation, thanks to technological integration which enables us to obtain more efficient services and processes (Moreno, 2015; Fernández-Güell, 2015). A Smart City would be achieved through technology and particularly ICTs according to six principal characteristics (Moreno, 2015): (1) e-Government and e-Governance, (2) mobility, (3) environmental sustainability, (4) intellectual capital, (5) quality of life (6) economic development.

The approach is not exempt from criticism. It is often identified as a buzzword aligned with political agendas and business interests, which includes spectacularised promises based on futuristic scenarios (Fernández, 2015). It is also criticised for its biased view, excessively focused on the technological dimension (Fernández-Güell, 2015). Therefore, in recent years it has evolved towards a holistic view of the Smart City, as a complex and multidimensional functional system in which citizens gain importance and share the decisions with political and economic agents (Moreno, 2015).

The Smart Tourism Destination is the final result of the transfer of the Smart City urban approach to tourist destinations (Baggio and Cooper, 2015), in which the freedom to evolve towards a type of planning based on the generation of knowledge and innovation with a strong associated technological component is particularly important (Huang, Goo, Nam, and Woo, 2017). This approach, in turn, forms part of a new tourism scenario of Smart Tourism; a logical evolution of traditional tourism and more recently, of the so-called E-tourism. Smart Tourism represents a different stage in the evolution of ICTs applied to tourism, characterised by the connection of the physical dimension with governance and the digital environment, which generates new levels of intelligence and changes in tourist experiences. Based on these considerations, Smart Tourism can be understood as *“tourism supported by integrated efforts at a destination to collect and aggregate/harness 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, Sigala, Xiang, and Koo, 2015). This concept has also been criticised in the sense that the intensive use of ICTs can generate alienation processes, for example by Tribe and Mkono (2017).

Smart Tourism is a new term which basically implies the application of intelligent technologies in all the phases of the trip, in order to improve the tourist experience and the competitiveness of the destination, thanks to an innovative management which supports the decision-making process (Koo, Shin, Gretzel, Hunter, and Chung, 2016). In recent years, the associated scientific production has increased significantly, and it has become a hot topic. However, it raises different questions which this article seeks to help resolve with the aim of further developing the knowledge in this field.

Therefore, this study has developed an analysis of systematic mapping according to the guidelines of Petersen, Feldt, Mujtaba, and Mattsson (2008), with the objective of characterising the scientific production related to the Smart Tourism concept. This technique, pertaining to software engineering (Kitchenham, Budgen, and Pearl Brereton, 2011), has been applied for the first time to the tourism domain and, specifically, to a new, very broad concept with a significant technological component. The process of analysing and classifying the primary studies begins with the design of the search strategy defined by a total of nine research questions: (RQ-1) What is the evolution and distribution of the research? (RQ-2) What is the evolution and geographical distribution of the publications? (RQ-3) What are the main types of research in accordance with geographical origin? (RQ-4) What are the main types of research developed? (RQ-5) What approaches are used? (RQ-6) What are the main subjects of interest? (RQ-7) Who are the authors of the most quoted studies? (RQ-8) Which technologies are associated to the Smart Tourism concept? (RQ-9) What are the most used keywords?

As a result, a total of 162 studies are obtained which have been classified according to the type of research, the approach used and the subject addressed. Using complementary information, such as geographical origin, the most productive authors, the most quoted studies, associated technologies and keywords, a response can be given to the initial research questions and the knowledge of this concept can be furthered.

Although authors such as Li, Hu, Huang and Duan (2016) indicate that this concept was coined in the year 2000 by Gordon Philips, the reality is that the scientific production with respect to Smart Tourism did not start to develop clearly until the year 2013, when six studies were published. In the year 2014, twelve studies were published, then 32 in 2015 and 25 in 2016. There seems to be a turning point in 2017 when a total of 75 studies were published. We are therefore able to affirm that the existing research in this field is at a preliminary or emerging stage, with very few theoretical-conceptual studies (11%), which address the essential aspects of Smart Tourism. In the same way, the critical reflections (1%) are practically non-existent, although critical comments may be found in articles which do not predominantly focus on this subject, which has been confirmed through a detailed reading of the studies. The majority of the studies analysed are technological applications (32%), methodological contributions (31%) and case studies (25%). Future research aimed at the theoretical-conceptual development and critical analysis of the concept, will complement the existing gap between knowledge and operational development in Smart Tourism.

The most frequently used research approach is Smart Experience (36.4%) and Smart Destinations (29%). Applying technology to improve the tourist experience is a key element of Smart Tourism (Buhalis and Amaranggana, 2015; Gretzel, 2016; Gretzel and

Jamal, 2009; Neuhofer, Buhalis, and Ladkin, 2012; 2015). In this sense, future research studies that identify each of these smart technologies and their scope of application in smart destinations and their most relevant aspects of improvement may favour the development of these destinations.

The topics that attract most interest from researchers are “Information systems, technological platforms and data science” (42%) and “Digital Marketing” (30.2%). These are two very broad categories which could give rise to the development of more specific studies that analyse, for example, data science in relation to the improvement of the management processes in smart destinations. In the same way, research into the application of technology focused on the improvement of governance processes (Pulido and Pulido, 2014), a key aspect of smart destinations, may provide new knowledge and establish processes for improving administration. For, example, Open Data from a smart tourist destination perspective.

With respect to the geographical origin of the research projects and focusing on Spain, the institutional leadership in the development of smart tourist destinations contrasts with the low level of associated scientific production. Therefore, there is a gap between the theoretical and conceptual knowledge and the practical development which should be filled by academics to provide guidelines for the correct application of the smart destination approach.

The technologies most associated to Smart Tourism, are the Internet of Things (IoT) (39%), Big Data (29%) and Augmented Reality (9%). They represent 77% of the technologies mentioned. The study of the specific use of each of them is another interesting topic for future research. In this respect, studies that analyse these applications in depth using systematic literature review techniques can provide valuable information and facilitate their development.

This study constitutes an initial approach to systematic mapping studies applied to tourism. However, it has a series of limitations which should be pointed out. First, and maybe most importantly, this technique does not explore the content of the studies in great depth. It classifies them into categories in order to gain an overall view of the scientific production in a specific field of study. It is not always easy to classify articles in into one category or another. Therefore, there is a certain degree of subjectivity involved. For this reason, a knowledge-sharing session was held before the final classification was made. The search strategy is another aspect which has limitations, from the selection of the label to the scientific engine where the search is to be made. This study constitutes a starting point for future research on systematic mapping in tourism.