SMART TOURISM AND SOCIAL NETWORKS: STATE OF THE ART

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Extended Abstract

***Purpose**: To present the state of the art of research in the intersection between Smart Tourism and Social Networks, trying to understand what have been the approaches when studying the role of Social Networks in the development of the Smart paradigm in tourism. The main research questions are: how has the relationship between Smart Tourism and Social Networks been observed by authors?; what have been the most broadly used techniques and analytical tools to take advantage of available data in Social Networks and feed a smart logic in the management of tourism companies and destinations?*
***Methodology**: A systematic search in scientific repositories (ISI Web of Science, Scopus, Abi/Inform Collection, Google Scholar, Academia.edu and Dialnet) was performed, with the end of 2018 as the closing date of it. Other than a general search including the topics "smart tourism" and "social networks", searches were also carried out for specific social networks (Facebook, Twitter, Instagram, etc.). Once duplications were eliminated and the adequacy the outputs obtained properly checked, a total of 61 documents were considered for this study, most of them journal articles (64%) and works of an empirical nature (67%), with 80% of them using primary data. Its chronology, based on the year of publication, has been as follows: 2010, 1; 2011, 2; 2012, 1; 2013, 5; 2014, 2; 2015, 6; 2016, 17; 2017, 18; 2018, 9. In addition to the evolution over time, attention was also paid to aspects such as most prolific authors, institutions and countries, journals, conferences and publishers that have embraced this topic with more intensity, type of research performed, objects of study, methodologies used, main contributions…*
***Main findings**: For the characterization of research in this area, with both a bibliometric and bibliographic analysis, tables 1 and 2, in the appendix, summarise the research lines which have been developed until the present, classified by the core nature of the work done (empirical or theoretical). Below, table 3 provides an overview of the most cited papers, in decreasing order.*
***Practical implications**: A detailed picture on the content of the research carried out in the abovementioned intersection is offered. The pattern followed in the area under study has been common in the academic community: first the presentation of papers in conferences and then publications in journals. In its life cycle we understand that scientific production in this subject of research is still in a growth phase.*
Geographically, the research that has been undertaken is dispersed, being a subject that has drawn interest from researchers from different areas of the world: Asia (the author and the university with the greatest amount of production are Korean), the United States, South

America (with Brazilians being the main proponents), Europe (with Spain and Italy being the countries with the greatest number of authors). However, analysis of co-authorship shows the need to open up inter-university collaborative processes at the national level and between universities from different countries more.
Both in the conferences where these works have been presented as well as in the journals where they have been published, most of them have a technological hallmark, with tourism-specific media lagging behind. This fact shows us how much room for growth there should be in specialised tourism forums. This technological aspect is clearly reflected in the keywords used, within which the largest group refers to techniques/tools for data analysis, with Big Data at the top.
With regard to the research question about how authors have addressed this relationship, it has been gradually consolidated and even intensified with the spreading of the smart tourism paradigm, with its data-intensive decision-making logic.
The issues of greatest importance found in this research, due to their results and approaches used in where social networks and smart tourism meet, have been: the creation of platforms for web services, the identification of tourism locations of special interest based on digital printing using social networks, the preferences of tourists engaged through social networks, communication strategies on these media, critical analysis of the roles of technology and institutions to shape a tourism service ecosystem. Nevertheless, other topics dealt with also worth mentioning are: the use of geo-tagging, web platforms as a communication channel, tourism recommendation systems, the effects of media exposure on travellers as well as the definition of smart tourism itself and its current trends. These findings shed light on the identification of the most broadly used techniques and analytical tools to harness available data in social networks and feed a smart logic in the management of tourism companies and destinations, our second research question.
***Originality/value**: The proposal of a research agenda in the field under study represents an extra contribution. New lines of research are suggested to further promote studies on social networks and smart tourism, organised into two large areas:*
**Tourism marketing:*
-Optimisation of tourism marketing activity (communication, promotion) using Big Data platforms supplied with data from social networks (among other sources).
-Sentiment analysis using the data available on a variety of social networks to understand people's feelings.
-Analysis of the impact of smart technologies in distributing tourism services.
-The role of social networks and the paradigm of smart tourism on the image of destinations.
**Tourism management:*
-Redesign of the governance of tourism destinations.
-Application of big data tools (data mining, etc.) to tourism destination management systems and to business intelligence.
-Semantic recommendation systems.

***Type of paper**: Literature review.*

***Keywords**: Smart Tourism; Smart Destinations; Smart Tourism Destinations; Social Networks.*

Appendix

Table 1: Theoretical works

No.	Research Lines
(1)	Systematic literature review of the ecosystems and business models of the IoT to build a conceptual framework on these types of business models; it uses qualitative research methods to analyse seven cases from the industry.
(2)	Theoretical study that examines 400 articles published between 206 and 2017 in journals related to communication, which have the social network Facebook among their key topics.
(3)	Analysis of the factors that have made the city of Venice one of the cases of touristification, such as cruises and overcrowding, with the aim of smarter management of tourism and avoiding tourist phobia.
(4)	A non-exhaustive study of the literature that explores and discusses the state of the art of the science of networks in tourism, as well as possible future developments.
(5)	Critically analyse the roles of technology and institutions in shaping a tourism service ecosystem.
(6)	Review of the literature on innovation in tourism and regional innovation themes in this sector in the Federal District (Brazil).
(7)	An exploratory study that undertakes a systematic review of the literature on tourism marking and the use of mobile apps.
(8)	Analysis of the development of tourism in Columbia based on a conceptual approach to the implementation of information technology, the Internet of Things and other tools.
(9)	A bibliographical study of emerging themes in the existing corpora on progress in social network research.
(10)	An exploratory study of the potential of ICTs in a broad sense, supplemented by a proposal on modes of implementation at a local level, more specifically in the Croatian tourism sector.
(11)	Theoretical and exploratory study of Smart Tourism Destinations and their characteristics, supported by two expert panels (academics and tourism professionals).
(12)	Exploratory study of the profiles of the stakeholders for smart city projects, its roles and missions.
(13)	Analysis of smart interactions between people and computers using personal mobile devices, with innovations that include augmented reality, location-based services, Facebook, gamification and smart interfaces.
(14)	Theoretical approach and description of smart tourism and its current trends, including the technological and business foundations for it.
(15)	Exploratory approach based on applying ICTs in tourism around three themes: electronic commerce and virtual reality (VR), tourism experience and augmented reality (AR) and shaping the destination's image. The constructivist theory serves as a theoretical framework.
(16)	Theoretical study based on apparently contradictory small scale and small world networks.
(17)	Descriptive and experimental study that is used to make conceptual distinctions and organise ideas on "hibridity in professional networked learning".
(18)	Theoretical work on the appearance Web 2.0 or Travel 2.0 that covers the concept of social networks / virtual communities and applies this to the tourism industry.
(19)	Theoretical and conceptual study to understand what are referred to as "social destinations" and the changes introduced in tourism business by social media
(20)	Conceptual and descriptive analysis of the network of stakeholders that intervenes in tourism activity, for the purpose of creating, developing and implementing measurement systems for it.

Source: own elaboration.

Table 2: Empirical works

No.	Research Lines
(1)	Identification of tourists' preferences for the purpose of making personalised recommendations by employing deep learning and fuzzy logic techniques.
(2)	Study of communication strategies on social networks (Facebook, Twitter, Instagram) by analysing content related to culture and tourism.
(3)	Analysis of the reviews made by hotel customers on Tripadvisor in order to understand preferred attributes concerns and requests.
(4)	Creation of user profiles based on tourism data collected from social networks.

(5)	Analysis of tourism demand using an online survey focusing on the use of mobile technology, exchanging data and smart technologies.
(6)	Identification of tourist spending patterns by applying algorithms to detect groups of activities and multiple regression techniques.
(7)	Identification of the most popular tourism places based on their digital impressions, using the Panoramio social network.
(8)	Make a methodological contribution to the management of a Smart Tourism Destination using Gephi.
(9)	Develop a tourism market segmentation diagram based on the different types of technological tools at the destination and their usability for tourists.
(10)	Show the impact that aspects such as training, information and socialisation have on user attitudes toward tourism attraction fan pages, applying Facebook as the platform for gathering data.
(11)	Identification of key tourist cities in Europe from the Korean tourism perspective using NAVER, the top internet portal in South Korea.
(12)	Identify the state and roll of mobile technology in tourism using optimised tools for the purpose of each study, such as Netminer, T-LAB and Leximancer.
(13)	By classifying online speech, identify the dimensions of the tourism destination using the Blogmete website platform to collect data, both on image as well as online reputation.
(14)	Analysis method for web content that automates and simplifies the extraction and acquisition of tourism content from many sources, using the Facebook application.
(15)	Descriptive analysis of a list of tourism brands for Spanish autonomous communities and cities by applying the PRGS (Presence, Response, Generation and Suggestion) model on Facebook.
(16)	Exploratory study of the implementation of ICTS by analysing content such as a competitive advantage factor in the Croatian hotel industry.
(17)	The classification and analysis of detection mechanisms for clone attacks on social networks using stenographic and static watermark techniques.
(18)	Present a platform, based on deep learning and fuzzy logic techniques, that uses social networks as data sources in order to support decision making by political actors in the context of smart tourism destination initiatives.
(19)	Find out if the use of geo-tags is the strongest predictor of tourist satisfaction using PLS-Graph.
(20)	Explores the use of Business Analytics in the context of the tourism industry using Google Maps and similar tools, using data mining methods such as Mashups.
(21)	Creation of a collaborative website to improve the tourist experience as a consumer and optimise the management process using the mining of hashtags as a user interface technology.
(22)	Analysis of social media platforms (Facebook, Twitter, YouTube, Pinterest, Instagram and Google+) and innovative web tools (such as the emotional web 5.0) to implement the Strategic Plan for Digitalising Italian Tourism, through five case studies.
(23)	Creation of a web services platform that will support applications and services adapted for tourists using merchandising techniques.
(24)	Systematic mapping of research in China through CiteSpace, using a combination of semantic network analysis of research subjects and analysis of collaborative social networks.
(25)	Study based on metrics for the flow centrality that are used to analyse social networks, more specifically, Facebook.
(26)	Analyse the relationship between traveller preparation, geo-tag technology perception and the adoption of geo-tags using PLS-Graph.
(27)	Establish the foundations for disseminating a smart tourism system that will contribute to facilitating a tourism industry based on IoT supported by 4g LTE technology.
(28)	Examine the impacts of experienced and inexperienced traveller media exposure on their intention to visit South Korea, using PLS-Graph.
(29)	Econometric analysis of panel data covering 43 tourism destinations in Florida (USA) from 2007-2015. The data was obtained using volunteered geographic information (VGI) from 4.6 million photographs shared on Flickr.
(30)	Analysis of smart tourism destinations as configurators of an integrated and multi-sector regional system in Apulia (Italy), using a web survey.
(31)	Analysis of smart tourism policies by means of a case study. Qualitative research using NVivo computer software.

(32)	Use of a model based on social networks to study the adoption of responses to demand.
(33)	Study of user interactions generated to express questions and answers on what is appealing about a tourism destination. To accomplish this, an XML schema is defined to represent the data that was pulled from AmFostAcolo (Romania).
(34)	The interpretation of the social flows that are produced in an urban area to support planning and management strategies in tourism, with data from the social networks Foursquare and Twitter.
(35)	Propose a system of indexes for managing tourism destinations through statistical analysis.
(36)	Research on intelligent tourism providing information in real time. Focusing on the case of the Korea Tourism Organization, the interconnection between its diverse technological platforms: websites, social network services in Facebook and Twitter, smart phone apps.
(37)	Examination of the multiple characteristic of the feelings expressed in the text from 70 million comments in tweets using the artificial neural network called a self-organising map by Kohonen.
(38)	The description of a model architecture for smart tourism systems adapted for cultural heritage and territorial data. Through a case study GEO-Business Intelligence (GEO-BI) is defined as a geo-referenced BI that adds available territorial information to the information on businesses taken from the Data Warehouse.
(39)	Analysis of communication with consumers that use social networks employing an online survey on Facebook.
(40)	Through Facebook groups and pages, analysis of information on brand building elements in tourism destination management.
(41)	Develop a semantic web using RDF, SPARQL and OWL technologies in addition to XML, turning the web into global infrastructure where it is possible to share and reuse data and documents between different types of users (W3C).

Source: own elaboration.

Table 3: Most cited papers

Title	Authors (year)	Author Keywords	Universities	Countries
Sharing economy in geotag: what are the travelers' goals sharing their locations by using geotags in social network sites during the tour?	Namho Chung and Hyunae Lee (2016)	Geotag, Social Networking Sites, Goal Theory, Travel Information Sharing	Kyung Hee University	Republic of Korea
Social Smart Destination: A Platform to Analyze User Generated Content in Smart Tourism Destinations	Andrea Cacho; Mickael Figueredo; Arthur Cassio; Maria Valeria Araujo; Luiz Mendes; José Lucas; Hiarley Farias; Jazon Coelho; Nélio Cacho and Carlos Prolo (2016)	Smart Tourism Destination, Smart City, Social Media, Twitter	Federal University of Rio Grande do Norte	Brazil
From Photos to Travel Itinerary: A Tourism Recommender System for Smart Tourism Destination.	Mickael Figueredo; Jose Ribeiro; Nelio Cacho; Antonio Thome; Andrea Cacho; Frederico Lopes; Valeria Araujo (2018)	Deep Learning, Fuzzy Classifier, Knowledge Based Recommendation System, Social Media	Federal University of Rio Grande do Norte and Newcastle University	Brazil and England
The impact of destination websites and cultural exposure: a comparison study of experienced and inexperienced travelers.	Chulmo Koo, Namho Chung, Dan J. Kim and Sunyoung Hlee (2016)	Korea, City Cultural Exposure, City Cultural Tourism, Destination Website, Information System Success Model,	Kyung Hee University and University of North Texas	Republic of Korea and USA

		Smart Tourism, Use and Gratification Theory.		
Smart tourism: foundations and developments.	Ulrike Gretzel; Marianna Sigala; Zheng Xiang; Chulmo Koo (2015)	Smart Tourism, Smart Technology, Smart Business Ecosystems, Business Models, Open Innovation, Big Data, Internet of Things	University of Queensland, University of South Australia, Virginia Polytechnic Institute and State University and Kyung Hee University	Australia, Australia, USA and Republic of Korea

Source: own elaboration.

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