The Impact of ICT on Actors Involved in Smart Tourism Destination Supply Chain

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The paper explores the impacts of technological development on actors involved in smart tourism destination supply chain, namely: destination factors, DMOs, hotels, and restaurants, transportations and intermediaries. The content analysis has been applied to analyse relevant full-length research papers published in leading tourism and hospitality journals in the last decade. Research findings support the conclusion that technological progress influences tourism destinations directly by influencing numerous business operations related to tourism resources management, tourism products integration and tourism destinations governance. The indirect impact reflects increased communication and cooperation between different stakeholders and destination planners which benefits the creation of integrated tourism product, local community, and sustainability of tourism development. By providing a holistic approach to the smart tourism phenomenon, and contributing to the understanding of the impact of the ICT on tourism destinations, this research presents a valuable contribution to the smart tourism literature.

Keywords: smart, tourism destinations, supply chain, information and communication technology, ICT, tourism, hospitality

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Introduction

Smart destinations are referred to special cases of smart cities, applying smart city principles to urban or rural areas considering resident and tourist efforts to support mobility, resource availability, allocation, sustainability and quality of life and visit (Gretzel et al., 2015). Moreover, the digital revolution has led to the emergence of this phenomenon in which knowledge and information are accessible to all stakeholders, facilitating them to carry out continuous innovation of their activities as much as possible (Jovičić, 2015). Information and communication technologies' (ICT') up to date solutions are a precondition of the above mentioned digital revolution that enabled a shift from destination to smart destination (Lamsfus et al., 2015), allow destination managers to evaluate and improve their supply chain networks with a respected level of accuracy. Namely, the existing ICT solutions available in the smart destination (such as smartphones or other mobile devices and applications) provide a large amount of information pertaining to many segments of the tourism industry including hotels, restaurants, transportation, intermediaries and DMO's, providing destination authorities with the required data to (i) analyse and improve efficiencies in their supply chains, and, over time, (ii) explain related tourists' experiences. Despite the number of papers (Spencer et al., 2012; Cobanoglu et al. 2013; Law et al., 2014) dealing with this phenomenon has significantly increased in last few years, some knowledge gaps still need to be more explored, namely in what manner does the smart, i.e., ICT, influence the actors involved in the tourism supply chain. The supply chain of smart tourism destination encompasses all the supply side agents and elements involved in the process of creation and delivery of tourism product (Sigala, 2008) and thus it can be described as a network structure that includes resources, suppliers, producers, and distributors (Zhank et al., 2008). In this paper, the authors conceptualise the tourism supply chain of the smart tourism destination to explore the impacts of smart ICT on constituting groups of agents and smart destination elements namely

resources (destination factors), DMOs, hotels and restaurants, transportation and intermediaries. Also, the authors argue ICT influences all the actors involved in the tourism supply chain directly by affecting their business operations and indirectly by fostering their mutual interrelations, communication, co-operation, and networks.

Methodology

For this research purpose the authors provided the content analysis to explore the most relevant full-length research papers published in leading tourism and hospitality journals between 2008 and 2018. Considering the journal selection, the authors follow the recommendation of Kim and Low (2005), Buhalis and Law (2008) and Law et al. (2014) to include leading publications and provide state of the art smart tourism supply chain related findings. Consequently, the selected publications list was based on *the SCImago Journal Rank (SJR) indicator* (Scopus® database from 1996), Q1 and Q2 journals. Between March and July 2018, the authors have searched within the included journals. The decision to retain the research paper for the further analysis was based on (1) its relevance for the subject (application of ICT in hospitality and tourism industry) and (2) its relation to at least one of the five actors involved in smart tourism destination supply chain. At the end of the data search, retained publications were grouped into the five main categories, namely the destination factors, DMOs, hotels and restaurants, transportation, intermediaries. The visual presentation of ICT impact on smart tourism destination supply chain research model as proposed upon mentioned data search is presented below (Figure 1).

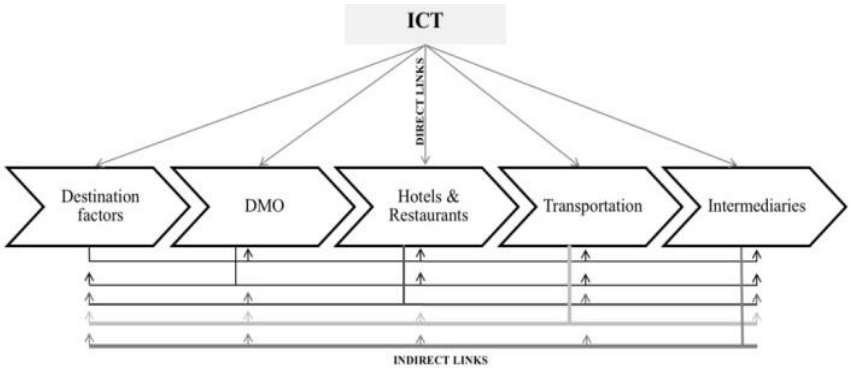

Figure 1: The proposed research model

Research findings

Following the proposed research model, the content analyses resulted with the main ICT contribution referring each named category. Firstly, referring destination factors show that smart technology appliances (Aoki and Yoshimizu, 2015) enable virtual information flow that improve value perception of destination resources and make guests closer to particular features. For example smart glasses with embedded augmented reality shape the perception of destination factors (Jung and Claudia tom Dieck, 2017). The smart glasses functionalities facilitate specific content to be pushed to visitors during their historical and geographical journey (Gouriévidis, 2016). Mobile augmented reality (MAR), including cloud-based MAR (Lee et al. 2017), supports information supply in a manner of a global travel guide. Additionally, the analysis of visitors' on-site activities contribute to the improvement of the destination resources management process, for example, traffic and consumption analysis through destination cards (Zoltan and McKercher, 2015).

Secondly, referring DMO's is, noticed that the impact of ICT on tourism and their possible future evolutions offer potential to shape a new scenario for destination management characterised by technology and data management (Ivars-Baidal, 2017). Moreover, ICT enables the environment in which tourism destination can be safely (Chiodi, 2016) and virtually explored, benchmarked and managed (Araña, 2015), tourism attractions shaped and

presented (Wang et al., 2016) and tourism products delivered and sold (Egger, 2012). The growing pressures on destinations generated by increased visitation have encouraged the researcher to explore the role of the technology and various ICT solutions in visitor management to plan, manage and monitor on-site tourism development in a sustainable manner (Yun and Park, 2014). ICT is also used to measure emotions and implications for tourism experience design (Kim and Feesenmaier, 2014), to foster customers co-creation and adaptation of newly developed services (Marques and Borba, 2017) and to receive a tourist's feedback regarding destination product (Pantano et al., 2017).

Thirdly, in regards to hotels and restaurants, it is evident that ICT influence hotel businesses by affecting their performances (Melian-Gonzalez and Bulchand-Gidumal, 2016) throughout process improvements and information sharing (Kuo et al., 2017). ICT also influences hotel financial performances, throughout revenue management (Croes and Semrad, 2012) and property characteristics (DeFranco et al., 2017). Hotels smartphone apps provide the hoteliers with valuable information regarding clients' habits (Garrigos Simon, 2015), but also improve protecting information disclosure and data privacy (Morosan and DeFranco, 2015). Social media and websites facilitate mutual communication and overall understanding between guest and hotels and restaurants and provide important promotional tools (Alonso et al., 2013), improve ordering experience and satisfaction (Yepes, 2014).

Fourthly, regarding transportation, the analyses suggest that tourist often use smartphones to obtain information during (1) tracking flight, or purchasing ticket for different transportation means; (2) navigating their travel routes; and (3) using their navigation apps for safety reasons (Wang et al., 2014). Navigation systems foster both, the international travel and organisation of transportation facilities in tourism destination (Hersh, 2016). Over time the role ICT becomes a crucial factor which facilitates interrail mobility (Jensen et al. 2015) and fosters the rise of online communities for train trips (Bae and Chick, 2016). Furthermore,

the valuable information on tourist moves in tourism destination through time and space can be obtained from user-generated content data collected from an open tourism web service (Jin et al., 2017).

Finally, in regards to the role of intermediaries as a smart destination actor, the research output suggests that the development of the ICT can significantly influence the mediators in tourism supply chain by providing the promised progressive shift from traditional to online reservation channels (Inversini and Masiero, 2014). ICT has encouraged the development of third-party websites commonly known as online travel agents (OTAs) (Rauch, 2017) like Expedia, Travelocity, Orbitz and most recently online booking platforms (Tekin Bilbil, 2018) including TripAdvisor, Booking.com and Airbnb. Finally, ICT has also boosted the development of so-called "intelligent agents" complementing in that manner the traditional intermediaries, i.e. travel agencies.

Discussion

Based on these research findings, we advocate that ICT enables the whole environment in which tourism destination can be managed sustainably and efficiently. Moreover, technology has facilitated the initial transformation of tourism destination conception, and it seems that this process continues. Over time, the smart tourism destinations gathered potential to evolve into the more advanced and sophisticated forms, i.e. living labs that would even serve as open innovation platforms (Abbate, et al., 2015). Most recently (Sheehan et al., 2016) discuss the use of the intelligence in destination management, elaborating the emerging role of the DMOs as intelligent agents that can identify, engage and learn from disparate stakeholders within and outside destination. Due to the ICT networking potential, hotels and restaurants are becoming increasingly visible and better accessible on the global market.

Consequently, numerous services provisions, the experience sharing, the guest care, and value co-creation has been already remarkably facilitated. The implications of hotel digitalisation are not only apparent but beneficial. Namely hotels have introduced keyless entry service, virtual check-in points (Starwood Hotels & Resorts), multifunctional hotel apps (The Hilton Honors and Marriott International), even robots (in 2016 Hilton McLean has introduced Connie, a Watson-enabled robot concierge). ICT development has been induced the development of transportation means, systems, and ways transportations services are delivered, facilitating in that manner the interregional and intraregional travel and availability of distanced destinations. Additionally, in smart destinations context, ICT has even been provoked both (i) more convenient and affordable provision of common services (for example traditional taxi vs Uber), and (ii) the massive expansion and dominance of sharing economy (Webb, 2016). However, many new, even unexpectedly, consequences are going to be revealed in the near future.

Last, but not least, the incorporation of ICT into sustainable tourism management over time encourages the controlling and monitoring process. Following this, various up to date tools such as sensors, Wi-Fi and WiMax networks and Big data management of daily processing of large volumes of data capture strategic information about what's happening in the region (López de Ávila et al., 2015). For example, the Interreg ShapeTourism project has delivered the ShapeTourism Observatory, the smart integrated tourism data system for MED Region that offers information, scenarios, and indicators on competitiveness, attractiveness, and sustainability based on collecting and processing Big data.

Conclusion

The research findings have demonstrated how ICT generates both direct and indirect impacts. The direct impacts of ICT integration in tourism destinations supply chain is revealed over

time, within the lasting process of improving operations which specify the manner of particular business, namely, how the tourism resources are managed and presented, how the tourism products are shaped and delivered, or how the tourism destinations are governed, promoted and accessed. The indirect impacts of the same integration have been reflected in the creation of cooperation involving different stakeholders fostering in that manner actually (i) networks and cooperation between service providers including the creation of integral destination products, and (ii) sustainable tourism development for the benefit of local community. Consequently, the authors strongly consider that this research has potential to contribute to both public and private sector stakeholders by expanding their understanding of the complex ICT impacts of actors involved in the smart tourism destination supply chain.

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