Smart business: the element of delay in the future of smart tourism

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Abstract

Purpose – *Smart tourism (ST) needs the development of smart business. The purpose of this study is to evaluate the future of the smart component of tourism companies, what their perspectives are and what factors can help to accelerate it.*

Design/methodology/approach – *A survey of 133 managers of tourist companies is the basis of the empirical information. The study was a personal survey carried out during FITUR 2019 International Tourism Fair of Madrid. The main element of the study is the future development of Information and Communication Technologies (ICTs) and smart tourism (ST) in business.*

Findings – *The results indicate that there is little development at present of the smart business ecosystem and that development will continue to be slow in the future. Moreover, this is not a critical issue in the agendas of companies. It was found that tourists pressure tourism through the extensive use of their smartphones, but only at the level of tourism resources. Furthermore, it will be the consolidation of the smart tourism destination that marks the medium and long-term design of smart business.*

Research limitations/implications – *The limitations concern the problems of a sampling procedure. Firstly, it operates with a database of managers' opinions; secondly, there are specificities of each company in particular.*

Practical implications – *The design of the smart tourism destination must incorporate the integration of tourism companies, both with a useful vision of ICTs towards the creation of experiences.*

Originality/value – *Research on smart business tourism is very scarce compared to smart destination and smart tourists. Also, the data are supported by managers of important tourism companies, as their companies are present at FITUR.*

Keywords *Smart tourism, ICTs, Smart business, Managers, Future perspectives*

Paper type *Research paper*

1. Introduction

The terms smart tourism (ST) and smart tourism destination (STD) have received great academic attention in recent years. The former focusses on the perspective of tourists and technological co-creation under the name of smart tourism destination (STD). The latter, STD, is focussed on tourist destinations and the technological applications implemented in them. However, tourism companies, the third type of touristic agent, are practically forgotten.

There is a general academic agreement that tourism companies often lag behind in adopting technological innovations (Khatri, 2019). When they participate, they do it based on an analysis of costs and efficiency (Finne and Sivonen, 2008). Thus, today, tourism companies have assumed digital innovation in various critical functions of the purchasing process (Melian and Bulchand, 2016), such as online reservations and revenue management, but minimally in the tourist's experiential process, an increasingly critical matter (Grewal *et al.*, 2017).

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The academic literature has established the experience as the central paradigm of tourism since the work of Wang (1999). What is relevant is that the experience has changed enormously, giving rise to the terms of technological tourism experience, firstly, and, more recently, to smart tourism (ST) experience, (Benckendorff *et al.*, 2019; Cai *et al.*, 2019). However, very little has been studied of the role that corresponds to tourism companies, which Kabadayi *et al.* (2019) have referred to as the smart service experience (SSE).

This work aims to expand the knowledge of this question, by ascertaining if and how, tourism companies intend to make digital innovations within the service processes, with the objective:

- To develop the SSE as an integrated part of the tourist experience.
- How such innovations should be integrated and correlated with STD public agents.

The work underlies the hypotheses that the business sector remains in its most typical behaviour because it fails to understand the development of ST as something critical to its business and will only pay attention to innovations that lead to improvements in the efficiency of its processes. Nevertheless, the pressure of the technological behaviour of the tourist, indirectly in the destination and directly in the tourist businesses, will act as a force that will irremediably encourage companies to accelerate digital innovation.

2. Smart tourism: literature review

The "smart" concept is key to the tourism industry (Celdrán *et al.*, 2018). In the literal sense, the term ST may be similar to "intelligence", although the significant difference resides in anticipation of the needs of the tourists through information (Jovicic, 2019). Information, exchange and processing are the three ingredients of the "smart" tourism application (Li *et al.*, 2017).

ST implies three main components (Gretzel *et al.*, 2015a; Pavlović and Čelić, 2018), all of them linked through the Information and Communication Technologies (ICTs) (Sigala and Chalkati, 2014):

1. The first is the smart destination, the critical aspect being the integration of the ICTs in the tourist infrastructure (Xiang *et al.*, 2015).
2. The second component is the smart business (Cantino *et al.*, 2019), understood as the generation of interactive platforms between private and public tourism stakeholders. It produces more dialogue, personalization and the best experiences (Koo *et al.*, 2016).
3. The third component is the social change caused by the convergence between the ICTs and the tourist experience: smart tourist (Buonincontri and Micera, 2016) or a tourist "with added intelligence".

Most of the applied projects and academic research have focussed on the first component. It has led to the full development of the concept of smart tourism destination (STD), with studies in many countries and cities (Celdrán *et al.*, 2018). As indicated by Hughes and Moscardo (2019), most studies are focussed on the use of ICTs in STDs. More recently, other perspectives are being considered, such as the importance of the brand for STDs (Coca-Stefaniak, 2019).

Research into the third component, smart tourist, has increased. The paradigm of the ST places a strong emphasis on the active perspective of the tourists (Koo *et al.*, 2017; Wang *et al.*, 2016). The success will depend on the perception of the tourists, on the level of coherence between their expectations, attitudes and behaviour (Martini *et al.*, 2017). Most of the research on tourists and their perception of ICTs focusses on the segmentation of markets. Redondo (2016) distinguishes between tourist 1.0 (Consumer), tourist 2.0 (Prosumer) and tourist 3.0 (Adprosumer), according to the degree of implication with the

technology. González (2017) establishes five central characteristics of the tourist, namely, connected, recommended, aware, alternative and influential.

ICTs are continually changing the models of tourist behaviour (Li *et al.*, 2017). The tourist experience improves through personalization, knowledge of the context and monitorization in real-time (Buhalis and Amaranggana, 2013; Gretzel *et al.*, 2015b; Neuhofer *et al.*, 2015).

The smart business component is poorly studied (Leung, 2019). The emphasis of studies has been on the adoption and evaluation of specific technologies by tourism companies (Table 1). Existing evidence is scarce and, in many cases, inconsistent (Hughes and Moscardo, 2019).

The tourist business must move from the logic of service to a logic focussed on experience (Duhan and Singh, 2019). The tourist experience is a continuum, offline and online (Batat, 2019a) because the ICTs go from being a mediator of experiences to comprising their core (Liburd *et al.*, 2017).

Today most of the new ICTs are disruptive (Hughes and Moscardo, 2019): the internet of things, open data, cloud computing, geopositioning systems, artificial intelligence, self-learning machines or cognitive computing are impacting all business areas. Their mode of operation, integrated and connected, creates "a hyperconnected" skin on the body of the tourists (Rabari and Storper, 2015) that develops new tourist experiences (Gretzel *et al.*, 2016).

The theory states that ST provides abundant information of interest to all businesses in the tourism chain: hotels, restaurants, transportation, intermediaries (Mandic and Garbin, 2019). Above all, the use of better-quality data, and especially its customization, has given rise to the tourist experience (Armstrong and Rutter, 2017; Batat, 2019b).

However, the current real situation of ST has a very different result towards the balance between its stakeholders. Advances in ICTs that allow generating synergies through shared information are still minimal (Koo *et al.*, 2019). The dependence of the technological role of the destinations is evident in all phases of tourist travel, especially during the core of it, when the tourist experience is more critical. Also, the technological implication of the tourist seems to be much higher in the post-trip phase, where its Electronic Word of Mouth role is central. Meanwhile, tourist companies seem stuck in the use of ICTs for marketing and promoting action (Khatri, 2019) characteristics of the pre-travel phase.

Consequently, the real situation of ST is far from its theoretical conception. Its components are neither independent nor in an equal position. Faced with the classical approach that supply pushes the technology, currently, it is the individuals who are increasing the use of ICTs (Wang *et al.*, 2014) considerably. Mobile terminals are already an integral part of the

Table 1 Relevant studies on ICTs in tourism businesses

Technology	*Authors*
Revenue manager	Croes and Semrad (2012)
Mobile uses by tourists	Wang *et al.* (2014)
Destination cards	Zoltan and McKercher (2015)
Smart glass	Gourievidis (2016)
GPS localization	Hersch (2016)
Tourism attraction shapes	Wang *et al.* (2016)
Big data	Jin *et al.* (2017)
Mobile augmented reality	Lee *et al.* (2017)
Online travel agencies	Rauch (2017)
Intelligent agents	Tekin (2018)
Geolocalization data	Ferreira (2019)
Data management	Koo *et al.* (2019)

Source: Self-made

daily routines of individuals, who use them with increasingly advanced technologies (Yildirim and Çengel, 2017).

The technological pressure of the tourist moves the tourism wheel. In the first instance, tourist attractions are the main ingredient of the tourist experience. Now the technological issue takes centre stage during the trip, and it emerges as another part of it, which requires destination administrators to generate real-time, fully customized responses (Li *et al.*, 2017). Thus, the STD is strongly committed to the active perspective of tourists (Buhalis and Amaranggana, 2013), key for the planning and management processes of the tourist destination (Vera-Rebollo *et al.*, 2017).

However, the tourist experience is a unicum. Companies must redesign their tourism services in the context of smart technological utilities (SSEs), with particular emphasis on the experiential process as a critical area (Grewal *et al.*, 2017). Thus, smart business should focus on offering a better experience through intelligent digitalization (Roy *et al.*, 2017).

Consequently, the real functioning model of ST follows an orderly period that begins with the technological pressure of tourists to improve their digital experience. A pressure that moves directly to tourist attractions, as physical ingredients of experiences and, secondly, to tourism companies to complete the double definition, physical and digital, of new smart tourist experiences (Figure 1).

3. Objectives and hypotheses

This paper focusses its purpose on including new research on ST, incorporating the business perspective. As there is some delay in the investigation of the perceptions and opinions of the managers of tourism companies, positioning is, therefore, critical for two reasons, namely, firstly, because its businesses directly face the provision of tourist services that are an essential part of the tourist experience and secondly, because they depend on the development of the smart business component.

The work has been designed to study the managers' current perception, as well as in the medium and long term. It studies 20 technologies, current and disruptive, for the three main stakeholders of tourism and ST, namely, tourists, destinations and businesses.

For the tourists, digital technologies have become a critical instrument of their trip (Amaro *et al.*, 2016). Specifically, mobile technologies have a significant impact on the attitudes of the consumers and their purchase intentions (Doh and Hwang, 2009; Ladhari and Michaud, 2015). For that reason, the companies should add technological utilities to their marketing practices, both to attract visitors (Usakli *et al.*, 2017), and also to increase the satisfaction of the tourists with their services. This directly affects the tourist companies (Liu *et al.*, 2014). Therefore:

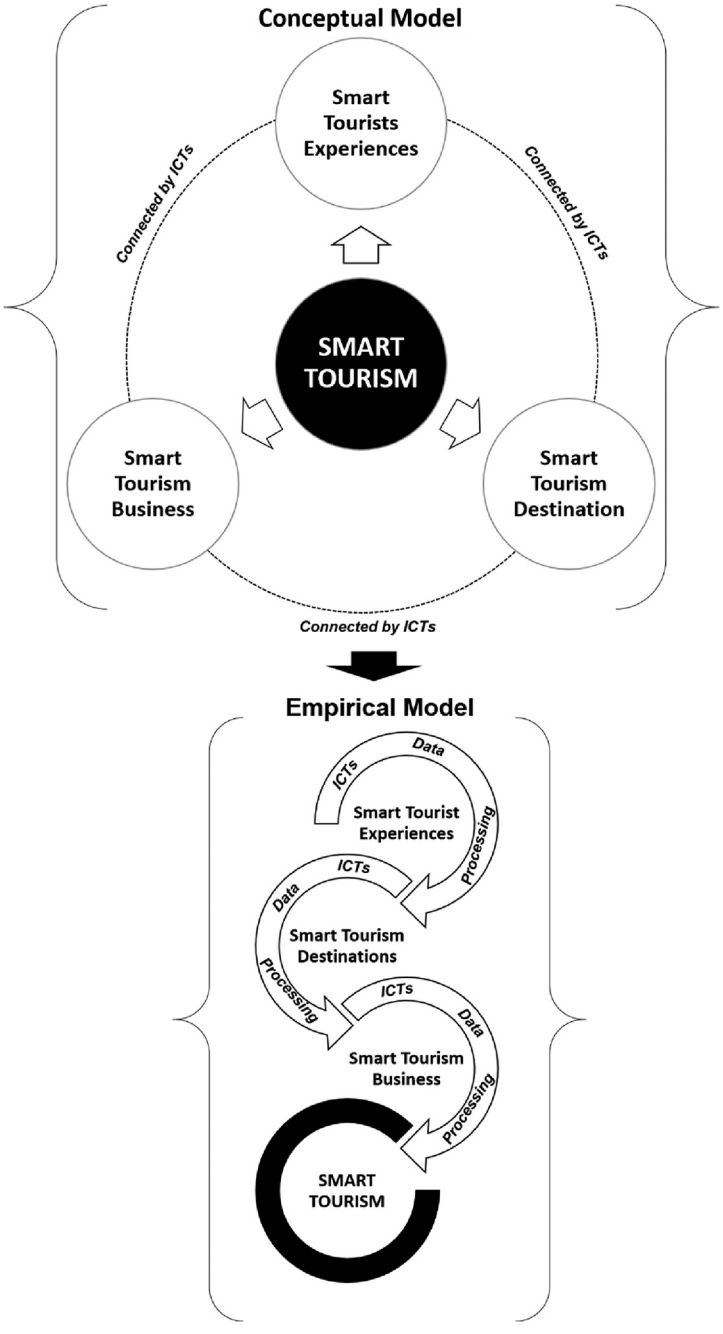
H1. The development of Smart Business will depend on the interest of the tourist to use technologies on their tourist trips.

The term experience implies the concept of value (Yang and Mattila, 2016); the tourists immediately assign different values to their experiences. Similarly, smart tourist destinations add value to the tourist experience (Chathoth *et al.*, 2016), by incorporating technology as a factor of improvement of the experience, through the strong interaction between the tourist and the attractions and with the other tourists (Buonincontri *et al.*, 2017). Therefore:

H2. The development of smart business will depend on the interest of the tourist to choose smart tourist destinations.

The development of ST is not so immediate, as the literature indicates. On the one hand, some particular segments concentrate the technological pressure of tourists, the millennial and zero generations (Batat, 2019a, 2019b) and not in the main tourist markets, such as the

Figure 1 Conceptual versus empirical model



Source: Self-made

sun and beach, rural and nature tourism. Also, the development process of the smart tourism destination is more political than real (Cantino *et al.*, 2019; Vasavada and Padhiyar, 2016). In consequence:

H3.1. The development of smart business is not a critical question now, so it must wait for medium-term development.

The development of ST requires a continuous exchange of information in an eco-system formed by tourists, destinations and businesses (Boes *et al.*, 2016; Perfetto and Vargas-Sánchez, 2018). It provides a great deal of new information for all stakeholders (Del Vecchio *et al.*, 2018; Mandic and Garbin, 2019). However, currently, this does not occur (Koo *et al.*, 2019), so:

H3.2. The development of smart business is focussing on applications more linked to the availability of business data, and less to the development of tourism experiences.

4. Methodology and results

The information used in this work corresponds to the data facilitated using a personal survey answered by managers in FITUR 2019, according to the technical characteristics indicated in Table 2. The survey focussed on Halls 8 and 10, specifically for tourism companies.

The selected database has operated with three broad groups of variables, namely, firstly, those which correspond to the role of technology in general on the behaviour of the tourist, previously used in the studies by Femenia-Serra *et al.* (2019) and Ivars-Baidal *et al.* (2019); secondly, the proposed technological utilities, extracted from the literature on the cases of technological digital innovations; and finally, variables indicative of the speed of technological change in tourist companies, to agree to a scheme of frequently used temporary horizons (Friedman, 1999; Green, 2002). Table 3 indicates the variables and scales of measurement.

Figure 2 allows us to understand the use of such variables according to the four hypotheses proposed in this study.

The statistical analysis of the data has been made with the International Business Machine programme Statistical Package for the Social Sciences (SPSS) v.24, developing the different typologies of contracts according to the formulated hypotheses.

Preliminarily, reliability analyzes have been carried out for both of the large blocks of variables, representative of the ICTs. The objective of testing the validity of the variables and the correct operation of their scales has been vouched for by the results of Cronbach's alpha, with values superior to 0.7 and with strong significance in the analysis of variance and Hotelling *T*-tests (Table 4).

Table 2 Technical details of the research

Unit of the sample	*Managers/CEOs of tourism companies*
Environment	FITUR 2019. Madrid, Spain Pavilions 8 and 10 of private tourist companies
Date of the work	23–24 January 2019. Professional days
Data collection method	A personal survey carried out inside FITUR
Sampling procedure	A complete census of the tourist companies present in FITUR 2019 with a fair stand (205 total) Business card with a mobile phone number to schedule the survey or notify the manager/chief executive order (CEO) of availability Maximum of three personal visits per stand to try to speak to the manager/CEO
Number of surveys	133 * valid (all)
Response rate	64.8%
Statistics conditions	$\alpha = 0.05$; $P = 0.5$
Sampling and error	$\varepsilon = +/- 5.05\%$

Notes: *For the business surveys, the sample size in absolute value (n) is less relevant. There are essential differences in size – billing, number of clients, geographic coverage – between companies. It is more critical to cover a larger market size than a more significant number of companies. When working with companies that install their stand at FITUR, it can assimilate that they are the most important in the sector

Table 3 the Base of variables and scales

Group	*Variables*	*Scale*
Technology and tourism (T_i)	Technologies are a principal part of tourist travels (T1) Tourists value positively that the destinations use the technologies to improve their experience (T2)	Likert (1 to 5)
Technological developments (U_i)	20 specific ICTs*: Analysis opinions (U1); artificial intelligence (U2); augmented reality (U3); beacons (U4); big data (U5); blockchain (U6); chatbots (U7); cloud (U8); connectivity 5 G (U9); immersive reality (U10); internet of things (U11); machine learning (U12); monitor social networks (U13); no immersive reality (U14); quick response (QR) codes (U15); robots (U16); semi-immersive reality (U17); sensors (U18); on time digital translators (U19); virtual reality (U20)	Known: Nominal (Yes or No). + If known, Interest for Destination, Companies and Tourist: Likert (1 to 5)
Technological future change (F_i)	Tourist businesses will change a lot because of technology in: the next two years (F2) the next five years (F5) the next nine years (F9) the next 12 years (F12)	Likert (1 to 5)

Note: *The definition of technologies can be found in the glossary of terms

Figure 2 Variables and hypothesis in the empirical model

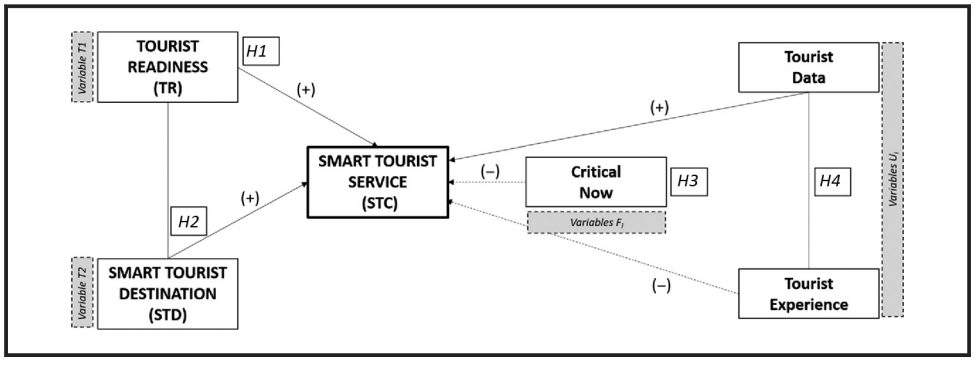


Table 4 Reliability analysis of the original variables

Statistic	*Group 1: technology and tourism*	*Group 2: technological developments*	*Group 3: technological future change*
Cronbach's alpha	0.773	0.752	0.812
Standardized Cronbach's alpha	0.785	0.778	0.844
ANOVA (sig.)	0.000	0.000	0.000
Hotelling *t*-test (sig.)	0.000	0.000	0.000

Firstly, each group of variables has its descriptive statistics. These statistics give an overall view of the results of the survey. Thus (Table 5), the high importance that ICTs have for current tourists is observed, it is significantly superior to STD attraction. For a set of 20 technological utilities studied, the average level of knowledge is above 13 ICTs (65%), ranging from a minimum of 5 to a maximum of 19. On the other hand, the average perceived utility of such ICTs is 3.37 out of 5, although there are substantial differences between each of them (Table 6). The case of the Blockchain in particular, has a high

Table 5 Average importance of ICTs in tourist travel

Variable	*Mean*	*Standard error of the mean*	*Valid interval*
T1	4.74	0.046	4.95–4.52
T2	4.04	0.039	4.19–3.88

Table 6 Degree of knowledge and assessment of the utilities of ICTs

ICTs	*Knows (%)*	*Values (means three agents)*
U9-connectivity 5 G	87.8	4.53
U7-chatbots	88	4.44
U20-virtual reality	87.8	4.48
U10-immersive reality	80.9	4.47
U3-augmented reality	69.9	4.46
U17-semi-immersive reality	62.5	4.40
U4-beacons	57.2	4.47
U11-internet of things	73.1	3.48
U19-translators	82.2	3.09
U14-no immersive reality	46.5	4.48
U16-robots	69.9	2.62
U12-machine learning	51.1	3.48
U8-cloud	87.2	2.02
U5-big data	66.5	2.56
U2-artificial intelligence	67.6	2.43
U15-QR codes	98.1	1.59
U13-monitor social networks	51.1	2.30
U18-sensors	64.6	1.77
U1-analysis opinions	40.7	2.40
U6-blockchain	12.2	4.18

valuation of utility; however, the knowledge of this ICT is deficient, only 12% of managers were aware of it.

The perception of the change in the tourist business due to the effect of ICTs is high. Although in the short term (two years), the average value is 2.46 (2 = 25%), in the medium term (five years) it increases to 3.44 (3 = 50%). Also, in the long term, a high perception figure is reached for the nine-year horizon: an average of 4.30 (4 = 70%) and bigger for 12 years (5 = 90%) (Table 7).

Secondly, regression analysis has been carried out with the direct objective of studying the hypotheses raised in the paper. In all of them, the dependent variable has been the perception of the future of smart business in 2, 5, 9 or 12 years (F1, F2, F3 and F4 variables). The six variables of the technologies and tourism group (T1, T2, T3, T4, T5 and T6) operate as independent in the regression model. Also, the research creates a moderating variable: the number of ICTs that the manager is aware of, to study whether

Table 7 Average perception of changes in the tourist business caused by ICTs

Future	*Minimum*	*Maximum*	*Mean*	*Standard error of the mean*
F12	4	5	4.99	0.005
F9	2	5	4.30	0.040
F5	2	4	3.44	0.031
F2	1	3	2.46	0.031

greater technological knowledge determines different perspectives for the future of smart business (M1: number of ICTS known).

Tables 8 to 11 show the results obtained in each regression analysis. Model 1 achieves the best *R* values, but all models exceed an *R* of 0.7 and are significant in the *F* test. The four analyzes – performed by the step procedure – operate with the same independent variables: T5 (technologies help the tourist obtain a more satisfactory experience); T6 (tourists value positively that the destinations use the technologies to improve their experience) and M1 (number of ICTS known). Cases 2.5 and 12 years operate with the three variables, while the case nine years operates with two (see tables).

A temporary representation could be the best way to study these results. Figure 3 indicates the values of the standardized beta coefficients in each of the regression analyzes. The two variables of interest for research (T1 and T2) follow very different movements. STD attraction

Table 8 Regression changes in business tourism in the next two years

Model	*R*	R^2	R^2-*adjusted*	*Sig. changed in F*
3	0.887	0.787	0.785	0.003
			Beta	
3	T1 tech as principal	0.755	27.805	0.000
	M1 number of ICTS known	0.175	6.534	0.000
	T2 STD attraction	0.063	2.975	0.003

Table 9 Regression changes in business tourism in the next five years

Model	*R*	R^2	R^2-*adjusted*	*Sig. changed in F*
3	0.781	0.610	0.607	0.000
			Beta	
3	T1 tech as principal	0.638	17.360	0.000
	T2 STD attraction	0.138	4.764	0.000
	M1 number of ICTS known	0.159	4.383	0.000

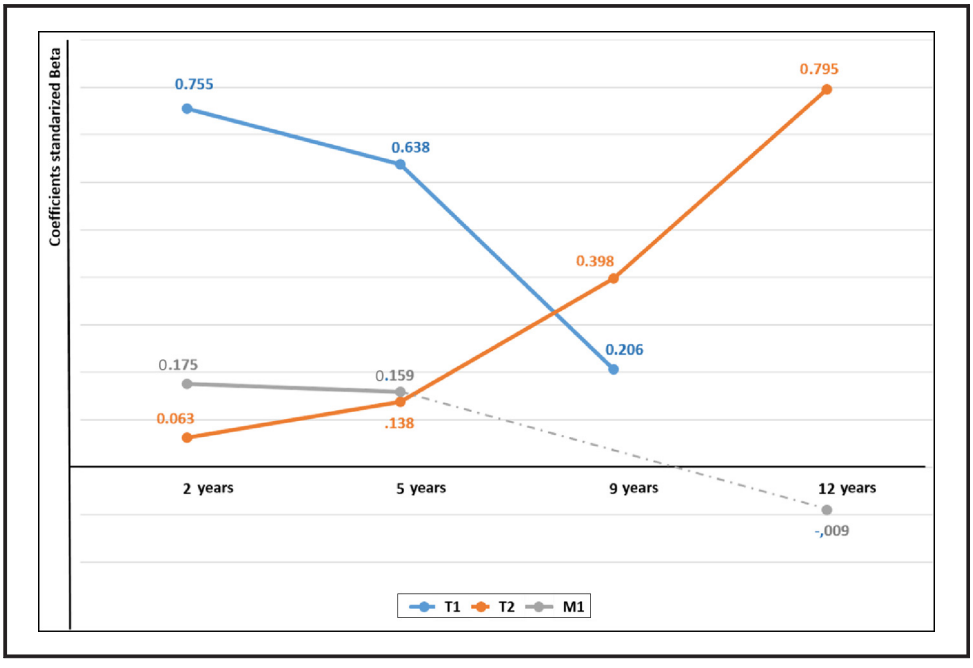
Table 10 Regression changes in business tourism in the next nine years

Model	*R*	R^2	R^2-*adjusted*	*Sig. changed in F*
2	0.778	0.628	0.625	0.000
			Beta	
2	T2 STD attraction	0.398	9.822	0.000
	T1 tech as principal	0.206	5.086	0.000

Table 11 Regression changes in business tourism in the next 12 years

Model	*R*	R^2	R^2-*adjusted*	*Sig. changed in F*
2	0.795	0.631	0.630	0.001
			Beta	
2	T2	0.795	28.782	0.000
	M1 number of ICTS known	−0.089	−3.229	0.001

Figure 3 A visual summary of the four regression analyzes performed



increases its value successively, especially for the nine-year horizon. The variable T1 (tech as Principal) have the most critical value in the two-years horizon, then it leaves relevance, even it disappears as a significant variable for the four analyzes. For its part, the moderating variable (M1: number of ICTS known) is more critical in the two-year horizon, falls in value in the five-year horizon and becomes inverse in the 12-year horizon (it is not significant in the third analysis).

A statistical summary model has studied ICT utilities: factorial correspondence analysis (FCA) (Table 12). The reduced value of the community of QR technology (0.138) has forced its elimination. So finally, the analysis has worked with 19 ICT utilities.

The FCA has relatively high validation values: the Kaiser-Meyer-Olkin test approaches 0.9; Bartlett's test is significant at 0.000; the accumulated variance exceeds 83% of the information, and the reduction is from 19 (variables) to 3 (final components). The first two-components have a high variance (more than 33%), while the third-component remains unchanged (15%).

The SPSS has performed a varimax rotation of FCA to optimize the weights of each variable in each component (Table 12). Thus, the composition and interpretation of the three components are:

1. C1: *Information mobile ICTS*, integrates with chatbots, beacons, augmented reality, digital translation, blockchain, 5G and no immersive reality.
2. C2: *Data ICTS*, integrates with opinion analysis, big data, internet of things, cloud, artificial intelligence, machine learning, sensors and Social Networks monitoring.
3. C3: *New realities*, integrates with robots, semi-immersive reality, virtual reality and immersive reality.

Figure 3 contains the graphic representation of the position of the three types of ST agents for each combination of ICT components (C1, C2 and C3). Logically, it is the interest

Table 12 Factorial correspondence analysis of ICT interest

KMO and Bartlett test			
KMO metric			0.891
Bartlett test		Sig.	0.000
Component	Sums of rotation of charges squared		
	Total	% of variance	% accumulated
1	6.537	34.404	34.404
2	6.374	33.548	67.952
3	2.930	15.424	83.376

Rotated component matrix			
	Component		
	1	2	3
U7-CHATB	0.947		
U4-BEACONS	0.934		
U3-AUGREA	0.933		
U19-TRASLA	0.933		
U6-BLOCK	0.929		
U9-5G	0.928		
U14-NOIMEREA	0.924		
U1-OPINA		0.889	
U5-BDATA		0.863	
U11-IOT		0.863	
U8-CLOUD		0.857	
U2-ARTINTE		0.857	
U12-MACHINE		0.850	
U18-SENSOR		0.846	
U13-MONISSNN		0.8342	
U16-ROBOT			0.949
U17-SEMIREA			0.879
U20-VIRREA			0.789
U10-INMEREA			0.762

valuations, agent-ICTs, based on the opinion of the managers surveyed. The interest of each technology (for tourists, for destinations and business managers) is rated with a value from 1 to 5.

Tourist destinations are best perceived in terms of technological usefulness. Destinations are the only actors that receive positive ratings for the three components, namely, information mobile ICTS, data ICTS and new realities. For C2, the valuation is the highest of all.

For tourists, components C1 and C3 (information mobiles and new realities) obtain positive values, also, the highest of the agents. However, for C2 (data), the utility of ICTs takes a negative value.

For tourism companies, components C1 and C2 take positive values, although never higher than the other actors. For component C3 (new realities), the valuation of profit is negative.

Euclidean distance is useful for measuring the differences between the three tourist agents (Figure 4). Tourist destinations and businesses have a best-accumulated distance (2.42). Secondly, destinations and tourists (3.4). The most considerable distance in ICT assessments separates business and tourists (4.4). The high value of the C1 (information mobile) utilities is what mainly explains the size of those distances.

Consequently, Table 13 presents the results of the paper hypotheses.

Figure 4 Graphical representation of the three agents, according to FCA

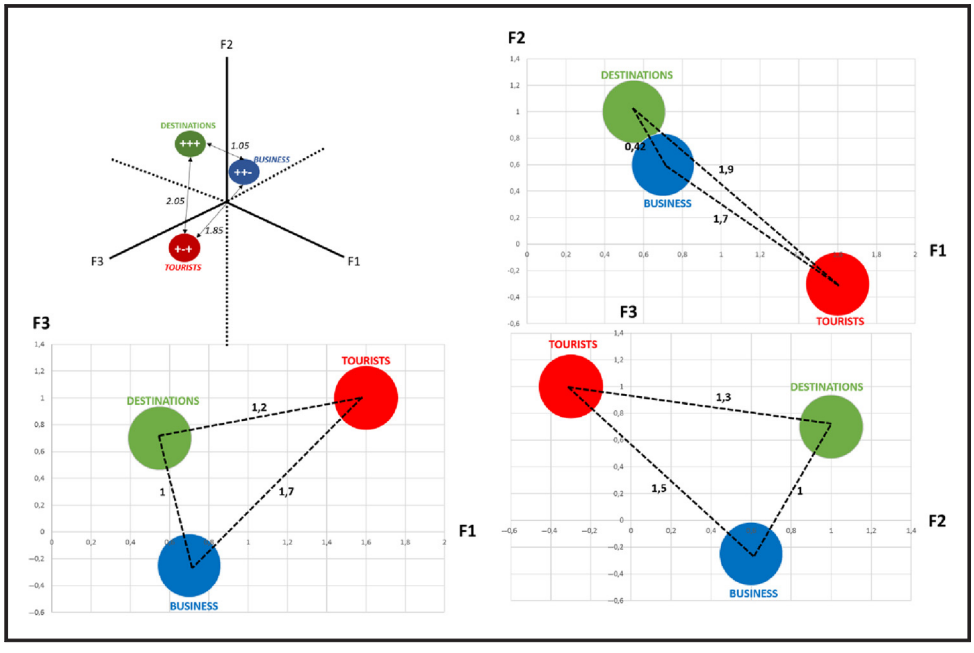


Table 13 Contrasts of the hypotheses

Hypothesis	*Methodology*	*Statistical significance*
H1: The development of Smart Business will depend on the interest of the tourist to use technologies on their tourist trips	Regression analysis *Accepted for a short-term horizon*	$\beta 1 = 0.755$ $\beta 2 = 0.638$ $\beta 3 = 0.206$
H2: The development of Smart Business will depend on the interest of the tourist to choose Smart Tourist Destinations	Regression analysis *Accepted for the medium and long-term horizon*	$\beta 1 = 0.063$ $\beta 2 = 0.138$ $\beta 3 = 0.398$ $\beta 4 = 0.795$
H3.1: The development of Smart Business is not a critical question now, so it must wait for medium-term development	Regression analysis *Accepted*	Net value two years = −0.54 Net value five years = 0.44 Net value nine years =1.3 Net value 12 years = 1.99 Stand error ≤ 0.040
H3.2: The development of Smart Business is focussing on applications more linked to the availability of business data than to the development of tourism experiences	Correspondence factor analysis *Partially accepted*	KMO = 0.891 C2 destinations = 0.453 C2 business = 0.102 C2 tourists = −0.824

5. Results and conclusions

ST is not yet adequately developed, as one of its three components (smart business) still lacks real development. Consequently, there is no need to speak of smart tourism destinations (STD) either, as the interactive digital technologies are implementing only tourist attractions and public services, and not the existing private tourist services.

Tourism companies are being very cautious about digital innovation. High investment and insecurity in which specific technologies are of interest, including prevention against the idea of sharing data in a single destination ecosystem both act as

deterrents. In this regard, business behaviour maintains the principles of innovation based on the relationship between cost savings and real and verifiable efficiency improvements in its processes.

Digital innovation focussed on generating the tourist experience is not among the priorities on the agendas of managers of tourist companies. They are not in a hurry to join ST, and when they do, they will prioritize the principles of cost and efficiency indicated above.

However, two interrelated factors can alter such an approach, having the same origin and the technological pressure of customers. Firstly, because the phenomenon of digitization of tourists is unstoppable, the acceptance and expansion of the smartphone make it one more component of the tourist's "body". Secondly, because technological utilities (webs, apps and chatbots) are no longer limited to the purchase and post-purchase process, the co-creation of the tourist experience also incorporates them throughout the trip. The challenge is not only to improve the classic tourist experience but also to create other modes of technological experiences (phygital) for an increasingly immediate future.

5.1 Academic implications

The academic literature on the concept of ST has been abundant. Nevertheless, it has followed separate paths to study each of its three components: smart tourist (STT) + smart tourism destination (STD) + smart business (SSE). However, the content and results of this work seem to suggest the need to consider the strong interrelationships between them. That the central paradigm is the tourist experience implies accepting that it forms a unique structure, where it is impossible to separate the part of the technological experience that the tourist co-creates (STT), from which the destinations (STD) contribute and from which tourist services (SSE) are generated.

Moreover, only to the extent that the three components interact, it will make sense to accept the existence of an ST based on the customization of information, online and ontime, that the tourist requests.

5.2 Business implications

Managers may need to start learning to develop the SSE sooner than they think as it is also a component of the new digital tourist experience.

While the results of this work are not ideals of respect (no entiendo and ¿qué quieres decir?), tourism is facing a future that is becoming more and more digital. Perhaps, the importance of online and ontime information also needs to be added to the services companies offer to tourists. A double reason that recommends managers to monitor new technology utilities closely.

5.3 Limitations of the study and future lines of research

The limitations of the research are those typical of a personal survey and of the type of research unit: business managers. Surveys always carry a burden of subjectivity and bias in the responses obtained that influence the results and conclusions. Also, the origin of the opinions is only from tourist agents, the business managers and not directly from the tourists or the STD managers.

Future research work must complete the study model of the three components of ST proposed. For this, it is necessary to replicate the fieldwork with the other stakeholders, whether tourists or STD managers. The researchers are working in this direction, planning to use the celebration of the next FITUR as the research field.

6. Glosario de aplicaciones tecnológicas

Analysis opinions: or sentiment analysis, refers to the use of natural language processing and text analysis to systematically identify, extract, quantify and study affective states and subjective information.

Artificial intelligence: It is intelligence demonstrated by machines to tasks considered to require “intelligence”.

Augmented reality: A real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, visual, auditory, haptic, somatosensory and olfactory.

Beacons: It is an intentionally conspicuous device designed to attract attention to a specific location.

Big data: A field that treats ways to analyze, systematically extract information from or otherwise deal with data sets that are too large or complex to be dealt with by traditional data-processing application software.

Blockchain: A growing list of open records, called blocks, are linked using cryptography, they are resistant to modification of the data.

Chatbots: A software application used to conduct an online chat conversation via text or text-to-speech, instead of providing direct contact with a live human agent.

Cloud: The on-demand availability of computer system resources, especially data storage (cloud storage) and computing power, without direct active management by the user.

Connectivity 5G: It is the fifth generation technology standard for cellular networks, with greater bandwidth, giving higher download speeds, up to 10 gigabits per second.

Digital translators ontime: A free machine translation service, with online operation usually through a smartphone app.

Immersive reality: The perception of being physically present in a non-physical world, by surrounding the user of the virtual reallity system in images, sound or other stimuli that provide an exciting total environment.

Internet of things: It is a system of interrelated computing devices, mechanical and digital machines provided with unique identifiers and the ability to transfer data over a network without requiring human interaction.

Machine learning: Computer algorithms that improve automatically through experience to make predictions or decisions without being explicitly programmed to do so.

Monitor social networks: The act of using a tool to listen to what is being said across the internet, monitoring media on millions of social sites.

No immersive reality: The visualization of the virtual elements is done through a screen to interact in real-time with different people or environments that do not exist.

QR codes: A type of matrix barcode that contains information about the item to which it is attached. In practice, QR codes often contain data for a locator, identifier or tracker that points to a website or application.

Robots: Or cyborg (cybernetic organism) is a being with both organic and bio-mechatronic body parts. They have enhanced abilities because of the integration of some artificial components or technology that relies on some feedback.

Semi immersive reality: It uses digital glasses and a device for tracking movements in the head, allowing the user to access digital visualizations and maintain contact with elements of the real world.

Sensors (Near field communication and similar): They are an electronic or electrochemical sensor that digitalizes and transmits the data.

Virtual reality: A simulated experience similar to or completely different from the real world, with applications to entertainment.

References

Amaro, S., Duarte, P. and Henriques, C. (2016), "Traveller's use of social media: a clustering approach", *Annals of Tourism Research*, Vol. 59, pp. 1-15.

Armstrong, K. and Rutter, C. (2017), *Exploring the Enigma of the Happiness Construct in Phygital Fashion*, Premier Reference Source, London.

Batat, W. (2019a), *Consumer Behavior, Customer Experience, and the 7Es (Chapter 11)*, Routledge, London.

Batat, W. (2019b), *Digital Luxury. Transforming Consumer Experiences (Chapters 10 and 11)*, Sage Publications, London.

Benckendorff, P.J., Xiang, Z. and Sheldon, P.J. (2019), *Tourism Information Technology*, Cabi Tourism Texts.

Boes, K., Buhalis, D. and Inversini, A. (2016), "Smart tourism destinations: ecosystems for tourism destination competitiveness", *International Journal of Tourism Cities*, Vol. 2 No. 2, available at: http://centaur.reading.ac.uk/75357/3/620SmartCIties_Clean2028129.pdf

Buhalis, D. and Amaranggana, A. (2013), "Smart tourism destinations", *Information and Communication Technologies in Tourism 2014*, Springer International Publishing AG, Cham, pp. 553-564.

Buonincontri, P. and Micera, R. (2016), "The experience co-creation in smart tourism destinations: a multiple case analysis of European destinations", *Information Technology & Tourism*, Vol. 16 No. 3, pp. 285-315.

Buonincontri, P., Morvillo, A., Okumus, F. and van Niekerk, M. (2017), "Managing the experience co-creation process in tourism destinations: empirical findings from Naples", *Tourism Management*, Vol. 62, pp. 264-277.

Cai, W., Richter, S. and Mckenna, B. (2019), "Progress on technology use in tourism", *Journal of Hospitality and Tourism Technology*, Vol. 10 No. 4, pp. 443-463.

Cantino, V., Giacosa, E., Alfiero, S., Shams, R. and Ferraris, A. (2019), "Introduction: smart tourism businesses (sustainability, measurability, awareness, recognition, and technology)", *Tourism Analysis*, Vol. 24 No. 3, pp. 261-263.

Celdrán, M.A., Mazón, J.N., Ivars-Baidal, J.A. and Vera-Rebollo, J.F. (2018), "Smart tourism. Un estudio de mapeo sistemático", *Cuadernos de Turismo*, No. 41, pp. 107-138.

Chathoth, P.K., Ungson, G.R., Harrington, R.J. and Chan, E.S.W. (2016), "Co-creation and higher-order customer engagement in hospitality and tourism services: a critical review", *International Journal of Contemporary Hospitality Management*, Vol. 28 No. 2, pp. 222-245.

Coca-Stefaniak, A. (2019), "Special: overtourism and the marketing of smart tourism cities", *International Journal of Tourism Cities*, Vol. 5 No. 4.

Croes, R. and Semrad, K.J. (2012), "Does discount work in the lodging industry", *Journal of Travel Research*, Vol. 51 No. 5, pp. 617-631.

Del Vecchio, P., Mele, G., Ndou, V. and Secundo, G. (2018), "Creating value from big social data: implications for smart tourism destinations", *Information Processing & Management*, Vol. 54 No. 5, pp. 847-860.

Doh, S.J. and Hwang, J.S. (2009), "How consumers evaluate eWOM (electronic word-of-mouth) messages", *CyberPsychology & Behavior*, Vol. 12 No. 2, pp. 193-197.

Duhan, P. and Singh, A. (2019), *M-Commerce. Experiencing the Phygital Retail (Chapters 7 and 8)*, Apple Academic Press, Oakville.

Femenia-Serra, F., Neuhofer, B. and Ivars-Baidal, J.A. (2019), "Towards a conceptualisation of smart tourists and their role within the smart destination scenario", *The Service Industries Journal*, Vol. 39 No. 2, pp. 109-133.

Ferreira, D. (2019), "Research on big data, VGI, and the tourism and hospitality sector: concepts, methods and geographies", in Sigala, M., Rahimi, R. and Thelwall, M. (Eds), *Big Data and Innovation in Tourism, Travel and Hospitality*, Springer International Publishing AG, Cham pp. 75-85.

Finne, S. and Sivonen, H. (2008), *The Retail Value Chain: How to Gain Competitive Advantage through Efficient Consumer Response (ECR) Strategies*, Kogan Page Publishers. London.

Friedman, A.L. (1999), "Rhythm and the evolution of information technology", *Technology Analysis & Strategic Management*, Vol. 11 No. 3, pp. 375-390.

González, L. (2017), "Cinco características que diferencian al turista 3.0", available at: http://www.cognodata.com/notas_de_prensa (accessed 28th May 2018).

Gourievidis, L. (2016), "Heritage, transnational memory and the re-diasporisation of Scotland", *International Journal of Heritage Studies*, Vol. 22 No. 4, pp. 277-290.

Green, N. (2002), "On the move: technology, mobility, and the mediation of social time and space", *The Information Society*, Vol. 18 No. 4, pp. 281-292.

Gretzel, U., Sigala, M., Xiang, Z. and Koo, C. (2015b), "Smart tourism: foundations and developments", *Electronic Markets*, Vol. 25 No. 3, pp. 179-188.

Gretzel, U., Werthner, H., Koo, C. and Lamsfus, C. (2015a), "Conceptual foundations for understanding smart tourism ecosystems", *Computers in Human Behavior*, Vol. 50, pp. 558-563.

Gretzel, U., Zhong, L. and Koo, C. (2016), "Application of smart tourism to cities", *International Journal of Tourism Cities*, Vol. 2 No. 2, pp. 216-233.

Grewal, D., Roggeveen, A.L. and Nordfält, J. (2017), "The future of retailing", *Journal of Retailing*, Vol. 93 No. 1, pp. 1-6.

Hersch, M.A. (2016), "Improving deafblind travelers' experiences: an international survey", *Journal of Travel Research*, Vol. 55 No. 3, pp. 380-394.

Hughes, K. and Moscardo, G. (2019), "ICT and the future of tourism management", *Journal of Tourism Futures*, Vol. 5 No. 3.

Ivars-Baidal, J.A., Celdrán-Bernabeu, M.A., Mazón, J.N. and Perles-Ivars, Á.F. (2019), "Smart destinations and the evolution of ICTs: a new scenario for destination management", *Current Issues in Tourism*, Vol. 22 No. 13, pp. 1581-1600.

Jin, C., Cheng, J. and Xu, J. (2017), "User-Generated content to explore the temporal heterogeneity in tourist mobility", *Journal of Travel Research*, Vol. 57 No. 6, pp. 1-13.

Jovicic, D.Z. (2019), "From the traditional understanding of tourism destination to the smart tourism destination", *Current Issues in Tourism*, Vol. 22 No. 3, pp. 276-282.

Kabadayi, S.A., Choi, H., Joosten, H. and Lu, C. (2019), "Smart service experience in hospitality and tourism services", *Journal of Service Management*, Vol. 30 No. 3, pp. 326-348.

Khatri, I. (2019), "Information technology in tourism and hospitality industry: a review of ten years' publications", *Journal of Tourism and Hospitality Education*, Vol. 9, pp. 74-87.

Koo, C., Mendes, F.L. and Buhalis, D. (2019), "Smart tourism and competitive advantage for stakeholders", *Tourism Review*, Vol. 74 No. 1, pp. 1-128.

Koo, C., Ricci, F., Cobanoglu, C. and Okumus, F. (2017), "Special issue on smart, connected hospitality and tourism", *Information Systems Frontiers*, Vol. 19 No. 4, pp. 99-703.

Koo, C., Shin, S., Gretzel, U., Hunter, W.C. and Chung, N. (2016), "Conceptualization of smart tourism destination competitiveness", *Asia Pacific Journal of Information Systems*, Vol. 26 No. 4, pp. 561-576.

Ladhari, R. and Michaud, M. (2015), "eWOM effects on hotel booking intentions, attitudes, trust, and website trust, and website perceptions", *International Journal of Hospitality Management*, Vol. 46, pp. 36-45.

Lee, I.J., Chen, C.H. and Su, C.Y. (2017), "App-based souvenirs and entry tickets: a new means of enhancing post-visit memories: a case study from Taiwan", *Tourism Management Perspectives*, Vol. 24, pp. 177-185.

Leung, R. (2019), "Smart hospitality: taiwan stakeholder perspectives", *Tourism Review*, Vol. 74 No. 1, pp. 50-62.

Li, Y., Hu, C., Huang, C. and Duan, L. (2017), "The concept of smart tourism in the context of tourism information services", *Tourism Management*, Vol. 58, pp. 293-300.

Liburd, J.L., Nielsen, T.K. and Heape, C. (2017), "Co-designing smart tourism", *European Journal of Tourism Research*, Vol. 17, pp. 28-42.

Liu, W., Guillet, B.D., Xiao, Q. and Law, R. (2014), "Globalization or localization of consumer preferences: the case of hotel room booking", *Tourism Management*, Vol. 41, pp. 148-157.

Mandic, A. and Garbin, D. (2019), "The impact of ICT on actors involved in smart tourism destination supply chain", *eReview of Tourism Research*, Vol. 16 No. 2/3, pp. 234-243.

Martini, U., Buffa, F. and Notaro, S. (2017), "Community participation natural resource management and the creation of innovative tourism YYYYYYYs: evidence from Italian networks of reserves in the Alps", *Sustainability*, Vol. 9 No. 2314, pp. 1-16.

Melian, S. and Bulchand, J. (2016), "A model that connects information technology and performance", *Tourism Management*, Vol. 53, pp. 30-37.

Neuhofer, B., Buhalis, D. and Ladkin, A. (2015), "Smart technologies for personalized experiences: a case study in the hospitality domain", *Electronic Markets*, Vol. 25 No. 3, pp. 243-254.

Pavlović, N. and Čelić, I. (2018), "Components of smart tourism", *TISC-Tourism International Scientific Conference Vrnjačka Banja*, Vol. 3 No. 1, pp. 324-339.

Perfetto, M.C. and Vargas-Sánchez, A. (2018), "Towards a smart tourism business ecosystem based on industrial heritage: research perspectives from the mining region of Rio Tinto, Spain", *Journal of Heritage Tourism*, Vol. 13 No. 6, pp. 528-549.

Rabari, C. and Storper, M. (2015), "The digital skin of cities: urban theory and research in the age of the sensored and metered city, ubiquitous computing and big data", *Cambridge Journal of Regions, Economy and Society*, Vol. 8 No. 1, pp. 27-42.

Rauch, M. (2017), "Hotel and mobile boost OTA online bookings", available at: www.phocuswright.com/Travel-Research/Research-Updates/2017/Hotel-and-Mobile-Boost-OTA-Online-Bookings (accessed 25 August 2018).

Redondo, M. (2016), "Turista 3.0, la experiencia de viaje es lo más importante", available at: https://cincodias.elpais.com/cincodias/2016/01/07/sentidos/ (accessed 28 March 2020).

Roy, S.K., Balaji, M.S., Sadeque, S., Nguyen, B. and Melewar, T.C. (2017), "Constituents and consequences of smart customer experience in retailing", *Technological Forecasting and Social Change*, Vol. 124, pp. 257-270.

Sigala, M. and Chalkati, K. (2014), "Investigating the exploitation of web 2.0 for knowledge management in Greek tourism industry: an utilization-importance analysis", *Computers in Human Behavior*, Vol. 30, pp. 800-812.

Tekin, E. (2018), "Platform cooperation in the tourism industry: conflicts and tensions caused by the closure of booking.com in Turkey", *Current Issues in Tourism*.

Usakli, A.,; Koc, B. and Sonmez, S. (2017), "How social are destinations? Examining european DMO common usage", *Journal of Destination Marketing and Management*, Vol. 6, pp. 136-149.

Vasavada, M. and Padhiyar, Y.J. (2016), "Smart tourism: growth for", *Tomorrow Journal for Research*, Vol. 1 No. 12, pp. 55-61.

Vera-Rebollo, J.F., Ivars-Baidal, J. and Celdrán Bernabéu, M.A. (2017), "Actas del seminario internacional destinos turísticos inteligentes: nuevos horizontes en la investigación y gestión del turismo", Alicante.

Wang, D., Xiang, Z. and Fesenmaier, D.R. (2014), "Adapting to the mobile world: a model of smartphone use", *Annals of Tourism Research*, Vol. 48, pp. 11-26.

Wang, N. (1999), "Rethinking authenticity in tourism experience", *Annals of Tourism Research*, Vol. 26 No. 2, pp. 349-370.

Wang, X., Zheng, X., Zhang, Q., Wang, T. and Shen, D. (2016), "Crowdsourcing in ITS: the state of the work and the networking", *IEEE Transactions on Intelligent Transportation Systems*, Vol. 17 No. 6, pp. 1596-1605.

Xiang, Z., Tussyadiah, I. and Buhalis, D. (2015), "Smart destinations", *Journal of Destination Marketing & Management*, Vol. 4 No. 3, pp. 143-201.

Yang, W. and Mattila, A.S. (2016), "Why do we buy luxury experiences? Measuring value perceptions of luxury hospitality services", *International Journal of Contemporary Hospitality Management*, Vol. 28 No. 9, pp. 1848-1867.

Yildirim, F. and Çengel, Ö. (2017), "Retail technology: a challenge on shopper oriented perception", *1st International Conference on New Trends in Communication. School of Engineering and Technology*, *Mody University of Science and Technology*, *Istambul*.

Zoltan, J. and McKercher, B. (2015), "Analysing intra-destination movements and activity participation of tourists through destination card consumption", *Tourism Geographies*, Vol. 17 No. 1, pp. 19-35.

Further reading

Buhalis, D. and Jun, S.H. (2011), "E-tourism", *Contemporary Tourism Reviews*, Vol. 1, pp. 2-38.

ICSC (2018), "Industry insights: gen Z shopping behaviors support retail real estate", available at: https://www.icsc.com/uploads/t07-subpage/Gen_Z_2018_Consumer_Series.pdf

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