Actas del Seminario Internacional *Destinos Turísticos Inteligentes:*
nuevos horizontes en la investigación y gestión del turismo

Universidad de Alicante, 26 y 27 de octubre de 2017

(SA)[6]: A new framework for the analysis of smart tourism destinations. A comparative case study of two spanish destinations

Topic 2. The development of STD: limiting & success factors. Case studies & best practices

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Abstract

The adoption of technology in tourism has changed destinations' communication and created the emergence of a new concept: *Smart Tourism Destinations* (STDs). The growing trend of *STDs* has been an increasingly relevant research topic. However, its novelty, together with rapid changes in the tourism field, has caused many difficulties to researchers and policy-makers. This paper aims to present a framework of analysis of STDs, afterwards, to test it in two destinations with different characteristics and level of smartness, finally, to specify which dimensions are more important and difficult to implement by the STDs. The results show that big and small destinations are facing different challenges in their smart tourism plans. The most important aspects of the framework of analysis are accessibility and management. Some issues, such as the availability of wi-fi, tourism website, mobile applications and public transportation are considered the basic features for any destination willing to be smart.

Keywords: smart tourism destination, smart dimensions, framework of analysis, best practices

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Resumen

La adopción de la tecnología en el turismo ha cambiado la comunicación de los destinos y ha creado la aparición de un nuevo concepto: Smart Tourism Destinations (STDs). Los STDs son un tema de investigación de creciente relevancia. Sin embargo, su novedad, junto con los cambios rápidos en el campo del turismo, causa dificultades a los investigadores y a los responsables políticos. Este trabajo presenta un marco de análisis de los STDs, lo prueba en dos destinos con diferentes características, y especifica qué dimensiones son más importantes y difíciles de implementar por los STDs. Los resultados muestran que los destinos grandes y pequeños se enfrentan a diferentes desafíos. Los aspectos más importantes del marco de análisis son la accesibilidad y la gestión. Algunas cuestiones, como la disponibilidad de wi-fi, sitio web de turismo, aplicaciones móviles y transporte público se consideran las características básicas para cualquier destino dispuesto a ser inteligente.

1. Introduction

Information and Communication Technologies (ICTs) have transformed the communication of tourist destinations (Gretzel et al, 2015a; Huertas & Marine-Roig, 2016), the way tourists organise and plan their trips (Del Chiappa & Baggio, 2015; Gretzel, 2011) and even the tourism experience (Buonincontri & Micera, 2016; Boes et al., 2015). Moreover, the adoption of technology by destinations has created the emergence of a new concept, *Smart Tourism Destinations* (STDs) (Buonincontri & Micera, 2016), that is being considered as a strategic way for tourism development (Gretzel et al., 2015a). Structural changes in the tourism sector require new approaches in destinations management (INVATTUR, 2015) and the adoption of new technologies with the aim to interact with stakeholders (Gretzel et al., 2015c), to make destinations more competitive (Zhang et al., 2012; Wang et al., 2013; Gretzel et al., 2015a), to offer tourists more personalised services and to generate more satisfactory experiences (Lamsfus & Alzua-Sorzabal, 2013; Buhalis & Amaranggana, 2013; Boes et al., 2015).

Nowadays the studies on STDs face many difficulties due to the fast and constant changes in the field. Nevertheless, since the emergence of the concept, different authors (Micera et al., 2012; Buhalis & Amaranggana, 2013) have started to define and characterise it. Several models and comprehensive frameworks (Buhalis & Amaranggana, 2013; Lamsfus &

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Alzua-Sorzabal, 2013) have been developed in order to collect the characteristics and dimensions of STDs. However, many authors agree that scholarly work on smart tourism is still lacking both conceptual and empirical development (Gretzel et al., 2015b). Femenia-Serra and Perea-Medina (2016) also affirmed that the growing but insufficient research about STDs did not completely analyse how each destination is applying the smartness, which initiatives are being carried out and which are their results (Komninos, Pallot & Schaffers, 2013).

Current STDs conceptualisations are based on the characteristics and models of *Smart Cities* (SCs) (Micera et al., 2012; Buhalis & Amaranggana, 2013; Lamsfus & Alzua– Sorzabal, 2013), as many authors consider that STDs must be SCs (Baggio & Del Chiappa, 2014). Considering that an STD does not always coincide with an SC, we have created a framework of analysis based on the dimensions of successful destinations defined by Buhalis and Spada (2000).

Besides, the current literature has not reached yet a consensus on the type of studies. Buhalis and Amaranggana (2013) affirmed that case studies are suitable for further investigation of the best practice of STDs and generating deeper knowledge on this subject. Gretzel, Sigala, Xiang and Koo (2015b) believe that publications are mainly based on case studies and theoretical papers are needed. Taking into account these facts, our study embraces two parts: a theoretical one with the presentation of a framework for analysis which is useful to guide the development of tourism destinations in the smartness direction, and an empirical one that tries to test or verify the framework in two real case studies.

The main contributions of the paper are two. On the one hand, it is the first comprehensive framework of analysis which includes not only dimensions and characteristics of STDs but also all their possible applications in destinations. On the other hand, it is also the first proposal of a framework for analysis not based on a perspective of SCs but the theoretical framework of successful tourism destinations (Buhalis & Spada, 2000). Hence, the objective of this paper is twofold: firstly, to present the framework of analysis and to implement it in two destinations that are different in dimension and level of smartness in order to test it as a valid methodology of analysis; secondly, to evaluate the framework of analysis to identify which

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dimensions are important for a place wanting to be STDs, which one are difficult to implement and which of them are being implemented nowadays generally. The final aim is to improve the knowledge about the development of STDs and to create useful tools of analysis for the management of destinations.

2. Theoretical background

In the existing literature, there are several studies related to the conceptualization of Smart Tourism Destinations. The initial research (Micera et al., 2012; Buhalis & Amaranggana, 2013; Lamsfus & Alzua-Sorzabal, 2013; López de Ávila & Sánchez, 2013) had as its main objective to define the concept and its characteristics or dimensions. Most of the authors affirmed that STDs emerged from the development of Smart Cities (Micera et al., 2012) and considered that the development of SCs made possible the emergence of STDs (Buhalis & Amaranggana, 2013). However, SCs and STDs are a different kind of entities, and López de Ávila and Sánchez (2013) were among the first authors that clearly distinguished both concepts.

All of these previous studies highlighted the use of technologies. Micera et al. (2012) analysed the use of communication technologies to promote the interaction and collaboration between tourism stakeholders, while Buhalis and Amaranggana (2013) considered that the application of technology to tourism improved the experiences of travellers and increased the competitiveness of destinations. This last publication was one of the first ones that developed a theoretical framework for STDs.

Lamsfus and Alzua-Sorzabal (2013) also created a framework to define the key characteristics or components of STDs. They affirmed that is necessary to change the existing infrastructure-oriented approaches towards service-oriented ones. Based on the characteristics of SCs, for these authors, the main components of the STDs concept are the investments in human and social capital, traditional transport and modern ICT communication infrastructure in order to meet the social, cultural, economic, leisure and personal needs of visitors.

López de Ávila, former president of Segittur (The Spanish National Society for the Management of Innovation and New Technologies), and García published in 2013 a paper conceptualising STDs. Spain is a pioneer country

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in the development of STDs (Femenia-Serra & Perea-Medina, 2016) because Segittur promotes innovation in the Spanish tourism industry. The paper included issues on sustainability, accessibility, knowledge and technological innovation in the conceptualization of STDs. This work argued for a complete differentiation between SCs and STDs, it presented action lines for STDs and it even showed a case study of El Hierro (Canary Islands), as the first Smart Island in the World and a clear reference of STDs.

Some case studies were also published in the beginnings of this field of study. Wang, Li and Li (2013) summarised a China's Smart Tourism Destination initiative based on the service-dominant logic, like other authors also did (Lamsfus and Alzua-Sorzabal, 2013; Gretzel et al., 2015), in order to understand the implications of STDs in China. These authors coincided with others (Zhang et al., 2012) in the definition of the three main components of STDs: Cloud Services, the Internet of Things and an End-User Internet Service System.

Lately, when the studies about STDs were expanding, some of them still focused on the definition of the concept or in the creation of theoretical frameworks. Boes, Buhalis and Inversini published in 2015 another work with the main purpose of conceptualising and characterising the concept of STDs. Although some studies are more based on the importance of technology for STDs (Wang et al., 2013; Zhu et al., 2014), they gave more importance to the social factors. The authors suggested a definition of STDs as places which use the available technological tools and techniques to enable demand and supply to co-create value, pleasure and experiences for the tourist and wealth, profit, and benefits for the organisations and the destinations. For them, the key dimensions of STDs are human capital, leadership, social capital and innovation, coinciding with Lamsfus and Alzua-Sorzabal (2013).

Buhalis and Amaranggana (2015) published another paper in 2015 in the same line focusing on stakeholders´ interconnection, personalised services and tourist experience. For these authors, STDs must allow tourists to be connected through technological platforms to generate Big Data. This Big Data must be analysed so that tourism destinations can offer more personalised services to tourists and create satisfactory tourism experiences. They highlighted the issue of 'Personalization', that means that destinations

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should know the preferences of each tourist to offer them what they need at the right moment.

Gretzel et al. (2015b) believed that the combination of tourist activities with smart technology is one of the important characteristics of an STD. This study based STDs not only on technology but also on business foundations. The authors affirmed that ICT have an important role in changing the tourism industry, but they also recognised that studies and theoretical development of business models for smart tourism are still lacking. Moreover, they provided a new critical perspective of STDs and highlighted key aspects to be analysed in order to achieve the smart tourism aims, such as the tourism information privacy, the extreme technology-dependence, the potential drawbacks of technology mediation or the real benefits of smart tourism in creating better experiences. Another publication of Gretzel et al. (2015c) defined the concept of *Smart Tourist Ecosystem*, trying to conceptualise all the stakeholders involved in smart tourism.

Some publications (Lamsfus et al., 2015; Vasavada & Padhiyar, 2016) were more focused on technology development and explained its usefulness. Lamsfus et al. (2015) presented how mobile devices enable tourists to get personalised information at any time and place. They also explained how technology infrastructures give information about the tourists to destinations and tourism stakeholders. The paper introduced a cloud-based infrastructure with the aim to improve the tourism experience. Other publications are more critical with what they call 'techno-myopia', arguing that most studies focus only on the development of technology and do not take into account other important aspects of STDs such as the management or tourism experiences (Koo et al., 2016; Gretzel et al., 2015b).

More recently, Buonincontri and Micera (2016), like previously other authors did (Zhu et al., 2014; Zhang et al., 2012; Wang et al., 2013; Lamsfus et al., 2015), identified the smartness of a destination on three technological components: cloud computing services, internet of things and end-user internet service systems. Buonincontri and Micera (2016) proposed an interpretative framework that shows how the technological components could improve the co-creation of tourist experiences in Smart Tourist Destinations. Other studies also demonstrated that co-creation increases the competitiveness of destinations (Binkhorst & Den Dekker, 2009; Neuhofer et al., 2012). In relation to tourist experiences, Lee et al. (2017) have recently created

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a model to show the effect of smart technology in the tourist's perceived experience and in his/her happiness. The authors argue that ICT has a direct influence on service satisfaction.

Moreover, tourist service satisfaction and tourist experience satisfaction have a significant influence on tourist happiness.

In summary, all the authors share a common agreement that smart tourism is closely based on the information technology and ICT infrastructures (Buhalis & Amaranggana, 2013; Boes et al., 2015; López de Ávila, 2015; Lamsfus et al., 2015), and its characteristics are mainly based on those of smart cities (Micera et al., 2012; Buhalis & Amaranggana, 2013). Most of them agree that the three required technology components for STDs are cloud services, internet of things and end-user service systems (Zhang et al., 2012; Zhu et al., 2014; Wang et al., 2013; Lamsfus et al., 2015; Buonincontri & Micera, 2016).

Firstly, several studies tried to define the concept of STD through theoretical frameworks or models. Lately, others have analysed concrete aspects as the effect of STDs in the co-creation of tourism experiences (Buonincontri & Micera, 2016) or in the competitiveness of destinations (Koo et al., 2016). Initial studies were more conceptual and theoretical (Boes et al., 2015; Gretzel et al., 2015b), but recent ones are more focused on case studies (Femenia-Serra & Perea-Medina, 2016; Lee et al., 2017). For example, Buonincontri and Micera (2016) analysed two European destinations (Venice and Salzburg), Lee et al. (2017) analysed Seoul, and Femenia-Serra and Perea-Medina (2016) considered three Spanish potential STDs: Alicante, Marbella and Málaga. However, different authors (Femenia-Serra & Perea-Medina, 2016) recognise that comprehensive conceptual frameworks with detailed measurable indicators are needed. In this context, our work tries to show, with an empirical research, the usefulness of a comprehensive framework of analysis that embraces 57 indicators to measure a wide range of the current characteristics and applications of STDs.

Recent studies are focused on some concrete aspects of STDs such as new technologies and their applications like Big Data (Höpken et al., 2017), Visitor Flows (Baggio & Scaglione, 2017) or Virtual Reality experiences (Marchiori et al., 2017; Tussyadiah et al., 2017), for example. However, most of them do not include the concept «smart» in their work. As we have observed

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in the evolution of literature, nowadays many studies analyse concrete aspects related to smart technology and many destinations are exploring the best applications of new technologies to improve the experiences and satisfaction of their visitors. Curiously, the concept of STDs is losing presence in the literature. This makes us think that maybe the label «smart» is losing its meaning because all technologies and destinations are evolving in the same direction and «smartness» will soon not be a distinguishing label among them.

3. Methodology

3.1. The new (SA)^6 framework of STDs

Taking into account previous studies, a new and comprehensive framework for the analysis of STDs was created. In the existing literature, STD models are mostly based on the dimension of SCs. This study proposes a new insight on STDs attributes by creating a framework that specifies even actions and applications of the STDs. It introduces the «smart» component in each of the six dimensions of a successful destination defined by (Buhalis & Spada, 2000): smart attractions, smart accessibility, smart amenities, smart ancillary services, smart activities and smart tourism packages. Each of them is concretized in specific indicators, 57 in total. A detailed explanation of the structure is presented in Table 1.

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Table 1: (SA)[6]: a comprehensive framework for the analysis of STD

Cr.	Sub-criteria	Attributes	Explanation
1. Smart attraction	Artificial attractions	Building	E.g. visitor centre, modern building personalised with geolocation, video and audio guides.
		Park	Artificial parks-oceanography, botanical garden
		Amusement	Quick-witted experience centre, sport complex
		Entertainment	Cinemas, live theatres, casinos, shopping malls applying ICTs in their operation and promotion.
	Heritage attractions	Heritage attractions	Historical immersion is offered through smart devices
	Special events	Special events	Use local sensors and crowd control at large events.
	Attraction manag.	Attraction management	Manage the attractions in a participative and collaborative way: public-private organisations, with citizens of the destination and tourists.
2. Smart accessibility	Physical mobility	Public transport (1)	The adequate connection between airports, ports, train stations, bus stations and the city centre.
		Public transport (2)	Adequate public transport between attractions.
		Public transport (3)	Good connections with the nearby tourism destinations.
		Geolocation system	Provide basic help to visitors, displaying all places of interest.
		Disabled and elder tourists	Adequate public transport support for disabled and elderly tourists.
		Traffic manag. (1)	Real-time traffic management system updated with optimal routes (Arup 2010)
		Traffic manag. (2)	Efficient management of intermodal transport.
		Traffic manag. (3)	Efficient management of the parking area by using up-to-date mobile applications.
		Traffic manag. (4)	Efficient management of the traffic with a high flow of tourists.
		Public safety	Video monitoring in tunnels, metros and unsafe areas.
	Digital mobility	Access to the internet	Free wi-fi connection in public spots
		Websites	Local tourism official website that follows the Web Content Accessibility Guidelines 2.0 (WCAG 2.0) and contains useful tourism information.
		Mobile applications	Provide mobile application that takes into account the Mobile Web Best Practices (MWBP) and the W3C (World Wide Web Consortium) recommendations.
		Social media	Establish and update frequently local tourism fan pages in social media.
		Promotion	Provide on-line some promotional materials.
		NFC tags and	Applied in points of interest through mobile

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		QR codes	devices (GSMA 2012).
		Information services	Travel information is provided in road panels, local web pages and mobile applications, considering visual impairments.
		Internet of Things	Use sensors/actuators in tourist attractions or tourist areas to obtain information about the visitors and to provide information to them.
		Recommendation systems	Provide real-time information for tourists about cultural activities or events that fit with their personal preferences.
	Accessibility management		Create assessment and management protocols to maintain and develop the accessibility of the attractions of the destination.
3. Smart amenities	Natural amenities	Natural amenities	Apply EMS (*Environmental Management Systems*) to the management of the natural amenities at two levels: local government and small and medium-sized companies (Lee, 2011).
	Built amenities	Hotel and restaurant	Use *Customer Relationship Management* systems (CRM) for an efficient management of hotels and restaurants.
		Control system	Use marketing systems (B2B, B2C) and *Central Reservation Systems* (CRS).
		Content management	Use perceptive *Content Management Systems* (CMS) integrated with social networks and geo-positioning.
		Innovative public-private network	Implement supportive PPP (public-private partnerships) between the local government and tourism enterprises to foster efficiency, creativity and innovation (Heeley, 2011).
		Hospitality network	Define an ICT-based innovative entrepreneurial hospitality network.
	Amenities management		Natural amenities: eco-regulation and sustainable management. Built amenities: sustainable management, participative public-private management in accommodation and gastronomy.
4. Smart ancillary	Bank	Smart banking	Provide smart banking and mobile banking services.
		Payment system	Use payment systems specific for tourists.
	Postal service	Postal service	Provide postal service support for tourists through tourism websites or mobile applications.
	Medical service	Medication geolocation	Provide geolocation of nearby 24h chemists, hospitals and medication services.
		Medical history and treatments apps	Provide smart multi-lingual applications which allow visitors to access their medical history and treatments.
		Medical tourism information	Provide information on medical tourism. Advice on the dangers of high levels of sun exposure and make a risk profile of each visitor.
	Local	Smart	Innovative and friendly communities

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	communities	community	
		Cultural exchange and mutual enrichment	Creation and promotion of new spaces for travellers to meet local residents, towards cultural exchange and mutual enrichment.
	Citizen journalism	Citizen journalism	Citizen journalism is used to enhance collaboration among users, information sharing and creativity via the Web (Johnson & Wiedenbeck, 2009). Citizen journalism programs allow tourists to participate in destination communication through ICT resources.
	e-culture		Creation of strategies which enable a visitor's respectful immersion in local history and traditions.
	Feedback		Deploy complaints management applications which allow tourists to easily register their complaints and directly route them to the appropriate city officials that should handle them.
	Ancillary management		Incorporate an international view in the management of the ancillary services.
5. Smart activities	Business-MICE	Business-MICE (Meetings, incentives, conferences, exhibitions)	Host MICE-tourism activities (meetings, incentives, conferences, exhibitions), organise gatherings on areas like education, religion or health, organise retreats in the destination (Buhalis, 2000b) (Buhalis & Spada, 2000).
	Leisure	Quick access to third-party leisure source	Provide quick access to third-party sources, such as activities timetable, travel planning or event ticket reservations.
		Open data	Management of the open data of the activities.
		Nature and adventure management	Apply DMS (*Destination Management Systems*) to manage efficiently nature and adventure activities in the destination.
	Activities management		Manage the activities in a participative and collaborative way (public-private organisations) with citizens and tourists.
6. Smart available packages	Transport package	Mode of transport	Efficient management of transport services in the packages: saving energy, improving sustainability, avoiding traffic jams, respecting parking areas.
	Accommodation package	Type of accommodation	Implement up-to-date mobile applications which offer available accommodation packages with on-line reservation.
	Service package	Services included	Offer multilingual application that gives an easy overview of the available packages for tourists (Jordan, B., 2011).
	Co-creation package	Chip-based Smart Tourist Card	Successful tourism experiences can be achieved through co-creation with a high level of technological support (Tussyadiah & Fesenmaier, 2009)

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			Design and implement chip-based *Smart Tourist Cards* which give access to a wide range of cultural and leisure activities, as well as to the public transport, and various discounts in shops.
		End-user Internet service systems management	Make a smart management of the end-user Internet service systems (e.g. sharing services and virtual pockets) to strengthen the interactions between tourists and the DMO.
	Package management		Creation and management of packages in a collaborative way: public-private organisations.

3.2. Case studies

The Spanish destinations examined in this case study are Valencia and La Pineda. Valencia is the third largest Spanish city (following Madrid and Barcelona) in terms of economic contribution, with around 800,000 inhabitants in the administrative centre[1]. Its Smart City plan, which also has a Smart Destination component, is being translated into specific actions like free wi-fi access at tourist attractions in the city centre, the upgrading of infrastructure and public transport, and quick and flexible connectivity with other cities. La Pineda is a small coastal town of 3,272 inhabitants (INE 2015) in Southern Catalunya. It offers leisure attractions like big thematic parks (Port Aventura, Ferrary Land) and the natural park ¨*Serra del Montsant*¨. Although La Pineda is not included in the national smart destination plan, it is taking numerous actions related to new technologies and to the enhancement of local tourism activities.

The selection of the samples has been motivated by the authors' desire to understand the current technological implementation in the two destinations, their tourism innovation objective, and their differences in terms of smart tourism destinations. In this study, choosing two very different sites has allowed us to focus on different spheres of attractions, accessibilities, amenities, ancillary, activities and available packages.

3.3. Data acquisition

In the application of the framework to the sample destinations, we collected the data in two steps. First, an online questionnaire was sent to the DMOs of Valencia and La Pineda. This prior questionnaire included 57 yes-no

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1. World Urban Areas – Demographia, 2016.

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questions and a scale/grade for each of them. The interviewees had to write a confirmation (yes/no) and a grade to each question. This initial step provided preliminary data which helped the researchers to highlight the main issues to be focused upon in the second step.

At the second step, two in-depth reconstructive interviews were performed to have a more empirical understanding of the application of the framework in the destinations and of the viability of the framework. Via this method, the interviewees (DMO's manager/ director) had the time and the opportunity to explain the information provided in the previous step, add supplementary data, and especially comment the practical implementation of each indicator in their city. In the final part of the conversation, after reviewing the 57 questions, the interviewees were asked to give their perspective on four factors: the obligatory aspects for an STD, the priorities in an STD plan, the dimensions that are harder to be achieved, and the future trends they envisage. The first interview with the Tourism Manager of La Pineda lasted for 120 mins, while the one with Valencia's Director of Innovation and Sustainability Tourism lasted for 150 mins. They were recorded and analysed by the researcher-interviewer.

4. Results

4.1. Application of the framework of analysis to both case studies

4.1.1. Smart attractions

Valencia offers a huge number of attractions as a big city, focusing on art, culture and sports. These attractions are well-located not only in the city centre but also in the surrounding areas*. La Ciudad de las Artes y las Ciencias* is a typical example of modern architecture, associated with the modern image of the city. Ninety per cent of these attractions have geolocation, showing a wide application of smartness in the city. The five quick-witted experience centres, one golf complexes and 17 water complexes are equipped with ICTs for their promotion and management. Valencia can be considered as a pioneer in sports tourism in Spain, and the application of Smart tourism is not only limited to the city centre's attractions but expanded to other neighbourhoods. The destination is developing a plan using local sensors for crowd control in large events, which also considers the use of the collected data. Despite these successful achievements, the city has also found several obstacles in attraction management. Firstly, it can be mentioned that the

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historical immersions offered through smart devices are difficult to deploy, in particular regarding the controversial perspective of attraction maintenance, especially on Valencia world heritage sites. Besides, the attractions are separately managed, either by public or private entities. There is only one public-private establishment involved in attraction management, the Tourism board; however, this organisation plays the general operation role more than the actual control in events.

On the other hand, La Pineda is a small destination which does not provide so many options to its visitors. In fact, the most notable attractions offered by the destination are artificial ones, mainly focusing on a one-day excursion (i.e. two conference centres with geolocation, one theme park, two modern parks). The most prominent one is Port Aventura, a huge quick-witted complex equipped with geolocation that includes a theme park, a water park, a golf course, five hotels, and a conference centre. The destination only provides a limited number of attractions for entertainment (e.g. casino, cinema, theatre), with a lack of ICT infrastructures. In spite of these limitations, La Pineda has a significantly positive attitude towards attractions management. There are two projects in progress by public and private sectors to manage jointly the local attractions. Moreover, a fund coming from a tourist public administration tax is spent for the promotion of the destination. It is noticeable that La Pineda is the first destination in Catalunya working on public-private management in tourism.

4.1.2. Smart accessibility

Regarding smart accessibility, the study demonstrated the predominance of Valencia as a big city and smart destination. Enjoying the advantages of a longstanding fixed infrastructure development, the city is furnished with an adequate public transport system. From the airports, ports, train stations and bus stations, tourists can reach the city centre very easily by metro or bus, with a frequency of 10-15 minutes per route. The attractions of the city are well-connected by four metro lines, five tram lines and 64 bus lines (52 daily lines and 10 night lines). Moreover, all of these means of transport were designed considering an appropriate access for disabled and elderly tourists. Besides, the city also has a public bike service with a reasonable price that covers most of the places of interest in the city centre. The connections to nearby destinations are provided by private suppliers and also by public train and buses. All the information about mobility can be easily found in the

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mobile application EMT Valencia (available on Android and iOS operating systems). Other positive aspects of mobility include the update of real-time traffic routes and the efficient inter-modal transport management through the website and the mobile application. The only weakness is probably a poor management of a very high flow of tourists on pick season, particularly, for Valencia, in the festival (e.g. *Las Fallas*).

On the contrary, La Pineda, as a typical small destination, does not possess a strong infrastructure to support its mobility. It offers a bad connection between attractions, poor transportation from the AVE train station to the centre, and it has not yet provided an adequate access to the local public transport for disabled people. However, there is an efficient traffic management in the peak season and good connection with nearby places. To reach the centre from Barcelona airport, Reus airport and Tarragona Port, visitors can take a bus with a frequency of 30 minutes. Regarding the control of the mobility of the high flow of tourists in summer, the DMO, in cooperation with local authorities, has come up with special policies to handle local traffic (i.e., more policemen, cleaners and volunteers).

Apart from physical mobility, nowadays digital mobility is also a key aspect in the implementation of a Smart Destination plan. Free wi-fi connection is a common issue in every tourism area. While La Pineda has not provided any free wi-fi access yet, due to the shortage of capital and investors, Valencia offers free wi-fi in several public spots in the city centre with 1-hour access limitation. Even though the coverage is about fifty per cent in certain central areas, many important tourism points have not been furnished with free access yet as trains station, bus station or the cathedral. Regarding social media accessibility, both destinations make a very strong effort in managing and connecting with their visitors through a networking communication campaign.

According to the DMO, La Pineda is one of the first destinations in Spain working in social media. Its social media fan pages (i.e. Facebook, Twitter and Instagram) are updated every day and they are appropriately linked with other promotional sources. Valencia has also innovated to manage its social media channels in a smart way. Particularly, the DMO appointed a team only focused on taking care of social media interactions, and everybody in the team can update information to the pages on behalf of the DMO following its guidelines.

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In regards to the accessibility to big data, both DMOs follow the same strategy: collaborate with another organisation in order to get the data. Valencia works side by side with the city council, while La Pineda gets the data from the Scientific and Technological Park of Tourism and Leisure in Vila-Seca.

4.1.3. Smart amenities

In terms of Smart amenities, both destinations are similar in their strategy and implementation. In the flourishing trend of sustainable development, natural amenities management is indeed the main concern for tourism development in any place. Taking into account this importance, Valencia has designed and deployed a huge project for natural management, specific for small– and medium-sized companies, in cooperation with the DMO. However, the project has met the obstacle of integration, since the DMO found it hard to make the private sector understand the benefit of ¨working together¨. Also, there is an EMS (Environmental Management System) available in the city, but it does not work efficiently due to the lack of big data. Besides, local amenities in the city of Valencia are managed under the SICTED (*Sistema Integral de Calidad Turística Española en Destinos*) standard. There are 74 banks operating in the city that follow the smart banking guideline.

Although La Pineda has not applied EMS in their management yet, the destination is working very hard on a successful sustainability plan. The DMO designed some specific strategies for maintaining the local natural amenities (i.e. plants, animals) by developing their relation with a local citizen, hence encouraging their «will-to-join» the project. The best point in the management of amenities in both destinations is their success in the public-private plan. While La Pineda embraces three co-operation plans to monitor their hotels and restaurants, Valencia comes up with the idea of an organisation, where the DMO organised the services platform (i.e. the idea, content, sell tickets), and the private suppliers join and sell their services through the network. The most successful project is ¨*VLC cuina oberta*¨.

Despite the success in CRS in the local restaurant network, Valencia has no plan for CRS in accommodation (neither La Pineda). The two destinations agreed that the drawback in planning the CRS system is its building cost and weak competitiveness in comparison with traditional CRS platforms (e.g. booking.com).

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4.1.4. Smart Ancillary

The application of Smart ancillary witnesses a notable reversal between the two destinations. At a first glance, one could believe that Valencia, as a big destination, would easily take advantage in its smart ancillary indicators. However, the empirical study has shown that La Pineda is ahead of Valencia on that topic. This can be explained by the differences in their local community plans (i.e. smart communities, smart citizens). While sharing similar local essential ancillary services (i.e. bank, postal service, medical service), La Pineda made up a difference by efficiently implementing concrete and specific plans, with the purpose of enhancing the quality of local community services in general and strengthening the relationship between local citizens and tourists. The destination offers about 12 cultural exchange festivals during the year, which really help to create new spaces for travellers to meet local residents and enrich mutual understanding. A project named «make them come back» was implemented. Its initial idea was to concern the community about the importance of tourism activities, how to behave and help visitors, and create an impression of a smart, open and friendly community. The project, unfortunately, did not work very well due to its novelty and the limitation of resources, but at least it indicates the DMO's concern on the issue.

Citizen journalism, e-culture and feedback management contribute to fulfilling a destination's smartness objective. Both places recognise the importance of these factors and, one way or other, they try to enhance themselves through many channels. La Pineda uses social media to foster their citizen journalism programme and to manage the complaints from visitors, and Valencia encourages tourists to interact with the city through the tourism website, and they have a web-based tourism marketing plan (online competitions, tourism day). While La Pineda demonstrates its effectiveness in managing feedback with social media by appointing a dedicated person to deal with it, Valencia has no specialised chamber or team responsible for managing tourists' complaints via the online channel.

4.1.5. Smart Activities

The execution of smart activities is quite similar in the two studied destinations. Several trending tourism activities, like hosting and creating business-MICE activities, and leisure activities such as nature and adventure recreation, are similarly deployed. Regarding the open data of activities

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management, which is undoubtedly a core aspect in an STD plan, the study has shown a positive result in both destinations.

Valencia, following its smart city and smart destination plan, has worked very hard on activities with open data management. The DMO works together with the city council with the purpose of getting and managing the open data collected from tourism activities. La Pineda, on the other side, collaborates with the Scientific and Technological Park of Tourism and Leisure in Vila-Seca in order to get the data. It can be considered that this approach is an innovative action in data management by the DMO, who reduces costs and uses its resources efficiently.

Besides, both destinations share the same perspective in activities management, enhancing public-private organisations in tourism activities and reacting to tourists' needs through many channels (i.e. social media, tourism office, apps).

4.1.6. Smart available packages

The practice of Smart available packages is mainly embodied in co-creation packages. In this respect, Valencia shows its superiority by providing diversified tourism packages through the implementation of smart tourist cards. Until February 2017, there are seven smart tourist card packages available. Transportation, restaurant services and excursion activities are skilfully combined in the package, giving visitors a variety of choices. The package information is provided in the tourism office, tourism website and the multi–lingual apps. This is also a typical example of the creation and management of packages in a collaborative way: public-private organisations, particularly the DMO as the representative of a public entity and the suppliers (restaurants, transports, attractions) as private ones.

On the other side, although La Pineda has not yet created any typical package, it is embracing the idea of developing several similar tourism packages in the long term, by making a good use of favourable local public-private relationships.

4.2. Assessment of the framework of analysis

A systematic study of the 57 indicators has been made, considering four following aspects: obligatory factors for an STD, factors that hard to achieve by an STD, proprietary factors and several trending aspects. For a destination which is on the way to be «smart», with a well-equipped infrastructure

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and physical attractions, accessibility is a must. Besides, the co-creation in tourism activities and packages, and the collaboration in public-private management are also inevitable.

However, the level of application of these factors in a big destination and a small destination is not the same. There are some elements which are obligatory in big– or medium-sized tourism areas (e.g. MICE infrastructure, metro/tramway for public transportation) but that may be dispensable in a small-sized place. Quality data obtained through sensors or social media is a valuable resource that every DMO wants for their smart destination plan in order to target the strategy and the promotion activities.

The difficulties faced by DMOs are obviously dissimilar. While in the small tourism site the main issues are financial support and resource allocation, the big region suffers from collaborative trouble. Particularly, the DMO has to deal with the problem of making all the stakeholders work together, giving information to each other and limiting the competition among them.

Table 2: Summary of STDs' factors divided into four categories: obligatory factors, priority issues, aspects which are hard to achieve, and trending topics

Obligatory	Priority	Hard to achieve	Trending
-Amenity help through ICT, apps -MICE -Control high flows of tourists **-Personalised geolocation** **-Entertainment centre** **-ICT application in management** **-Adequate public transport** **-Free wi-fi** **-Social media & mobile apps integration** **-Co-creation of packages**	*Public transport* *-Local infrastructure* *Wi-fi* -Sensors/ actuators for big data **-EMS management system** **-ECO-regulation & sustainable management** **-Open data management**	*-Historical immersion: need capital,* conflict with the maintenance *-Public transport: need investment,* security, privacy permission *-Real-time monitoring: need investment* *-Wi-fi: need investment* -Sensors and crowd control: need financial support -Smart citizen & Co–creation: big size-> harder to integrate	**-More technological execution in operation and management** More focus on security and privacy **Mobile apps will have more specific functionalities.**

Note: Italic items are specified for the small-sized destination, underlined items are specified for medium/big sized destinations and bold items are common to all destinations.

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Since technology is so advanced and develops so quickly, a deeper combination between tourism activities and technologies is absolutely trendy. A typical example for this vogue is the development of new mobile tourism apps which focus more on a purpose or a specific function (e.g. public transport apps, excursion apps, restaurant apps).

Last but not least, the smart destination plan must take notice of social sustainability development, environmental protection, and data management, which are not only tendencies but also priorities for any tourism place.

5. Discussion

Firstly, the study has shown that the framework of analysis, which was created from a model of successful tourism destinations (Buhalis and Spada, 2000) and not from any smart city pattern, is valid for the analysis of smart tourism destinations. Thus, despite SCs and STDs have many characteristics in common, like their technological foundation (Micera et al., 2012; Buhalis & Amaranggana, 2013; Lamsfus & Alzua– Sorzabal, 2013), the focus and the objectives convert them in two different realities, as other authors had already affirmed (López de Ávila & Sánchez, 2013).

The study has also proven that the proposed framework of analysis can evaluate the smartness level of a destination through the detailed examination of its practical applications. This is one of the main contributions of this work since, due to the huge number of possible applications and the fast technological evolution, up to now the existing frameworks of analysis (Buhalis & Amaranggana, 2013; Lamsfus & Alzua– Sorzabal, 2013) collected only the main characteristics or dimensions of STDs, but not all the possible applications.

With the application of the framework of analysis into two very different case studies, we have tested its practical use and we have shown it is indeed useful for the analysis of the level of smartness of destinations in several dimensions, even in destinations with radically different characteristics.

Although none of the destinations meets all the indicators or has all the applications that STDs can develop, it can be observed that most of the presented dimensions exist in both of them, so they are two examples of STDs. On the one hand, Valencia is a recognised STD, which has been a pioneer in Spain in the development and application of technology and which has established a clear objective in its smart development. The application of the framework of analysis has proven these facts. Valencia has many smart

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attractions, it offers free wi-fi in many spots of the destination, it manages (jointly with other organisations) the open data collected from the tourists' activities and it offers packages co-created through public-private collaboration. On the other hand, the smart development of La Pineda also has to be highlighted. Despite its limitations in terms of public transport or data collection, it also meets many aspects of the framework and it has shown its smartness on some issues such as the management of social media, the public-private cooperation in tourism activities or its local citizens' programme.

Although technology has a high cost and the smart development is only accessible to big destinations with enough resources, the study shows that small destinations can also develop smart aspects with fewer resources, like a convincing social media campaign or an efficient tourism management through the collaboration of public and private stakeholders. It is indisputable that destinations with scarce resources are limited in the development of smart infrastructures, a powerful transport network or free wi-fi network. However, we have observed that destinations with substantial assets face difficulties in achieving the collaboration among all tourist stakeholders, due to the huge number of actors involved. Likewise, it has been shown that there are several smart aspects that can be developed with few resources: the creation plans for sustainable tourism, a good management of social media, public-private management, and even the involvement of local citizenship or the deployment of mobile applications. In fact, La Pineda has surpassed Valencia in smart ancillary by creating plans to improve the quality of local community services and by strengthening the relationship between local citizens and tourists.

On the basis of the results of this research, it can be observed that even small destinations like La Pineda, which is not considered smart and does not have as objective to get that recognition, are evolving in the direction of applying new technology with the aim to improve their tourism services and to be more competitive. Hence, this may reveal an initial hypothesis that several destinations, regardless of their volume, resources and tourism objectives, are moving forward in the same smart direction: applying new technologies to achieve more personalised and satisfactory tourism services and being more attractive and competitive.

Last but not least, the study has allowed identifying which dimensions of the framework of analysis are a priority to be an STD, which of them are required, which of them are hard to achieve, and the current development

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trends. The most important indicators of the model, which correspond to the most significant topics of smartness, are accessibility and management, followed by smart attractions. Particularly, digital accessibility (free wi-fi, website, mobile applications) and physical accessibility (public transportation) are considered the basic features for any destination willing to achieve «smartness». The management, especially co-creation and sustainability, is also appraised as a basic component in the strategy, due to the synergistic, cohesive and resource-allocation role of DMOs. Moreover, the implementation of ICTs in local attractions, which would enhance tourists' interactivity and satisfaction, makes up a significant part of an STD plan. Likewise, the research also indicates several trending aspects, including the deployment of mobile applications, which focus on a specific function (for instance, apps. only for parking or accommodation reservation), and the increasing involvement of citizens in the Smart Tourism plans.

This framework of analysis will be useful for destination managers, to evaluate their smartness development, and also for authors who study in the Smart Destination field, as it provides a guide towards the concrete indicators to be measured in a destination to achieve smartness. The analysis of the required indicators, the limitations and trends will also help DMOs in the management of the smartness of their destinations.

Acknowledgements

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