

**Proceedings of the  
5th International Conference on  
Tourism Research**

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Portugal**

**19-20 May 2022**



**Edited by  
Prof. Cândida Silva, Prof. Mónica Oliveira  
and Prof. Susana Silva**

**Proceedings of the**

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**Hosted By**

**The School of Hospitality and Tourism**

**(ESHT)**

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## Contents

Paper Title	Author(s)	.Page No.
<b>Preface</b>		vi
<b>Committee</b>		vii
<b>Biographies</b>		ix
<b>Keynote Outlines</b>		
<b>Research papers</b>		
The COVID-19 Pandemic and its Effects on the Future of Study-Abroad Programmes at Selected Universities in South Africa	Elhaam Abrahams and Hilary Kennedy Nji Bama	1
A Theoretical Reflection on the Importance of Branding to Promote Thermal Destinations	Vera Antunes, Gisela Gonçalves and Cristina Estevão	10
Online Food Delivery: An Overview and Bibliometric Analysis	Alberto Badenes-Rocha, Enrique Bigné and Carla Ruiz	20
The use of the Airbnb Collaborative Platform in Romania: A Survey-Based Research	Alina Badulescu, Elena Stiubea, Ramona Simut and Daniel Badulescu	30
Creating a City Image Based on Foreign Visitors' Views Retrieved From Historical Documents: The Case of Porto	José Luís Braga, Isabel Borges, Catarina Mota, Sónia Leite and Miguel Magalhães	38
The Question of Sustainability - When Ecotourism Becomes Overtourism: The Example of the Kruger National Park, South Africa	Michael Brett	46
Adventure Sports and Nature-Based Tourism: Assessment of Canyoning Spots in the Northern Region of Portugal	Alexandra Correia, Goretti Silva and Susana Rachão	56
Circular Economy in the Portuguese Hotel Industry: An Empirical Overview	Berta Costa, Susana Rodrigues, Carina Silva and Maria Pilar Moreno Pacheco	65
Impact of Covid-19 in the VAICTM in the Hospitality Industry: The Portuguese Case	Vânia Costa, Maria de Lurdes Silva and Paula Loureiro	74
Promotion of Destinations Through Interactive Digital Marketing: Collaborative Model for Smart Cities	Carlos Cunha, Vítor Mendonça, Márcio Martins and Manuela Carneiro	84
Demand for Domestic Marine and Coastal Tourism	John Deely, Stephen Hynes, Mary Cawley and Sarah Hogan	93
Accessibility of National Cultural Heritage to Deaf Tourists	Paula Escudeiro, Márcia Campos Gouveia, Bruno Cunha and Nuno Escudeiro	102
Big Data, Social Media and Employer Branding: An Exploratory Study From the Hospitality Industry	Hazal Eser and Ipek Kalemci Tuzun	110
Mobilides, Context Costs and Heritage in Tourism and Leisure Relations on the Border of Central Portugal with Spain	Gonçalo Fernandes	117
Literary Routes as a Successful Tourist Offer in Porto	Ana Ferreira, Elisa Alen and e Pedro Liberato	126

## Preface

These proceedings represent the work of contributors to the 5<sup>th</sup> International Conference on Tourism Research (ICTR 2022), hosted by The School of Hospitality and Tourism, of Polytechnic Institute of Porto, Portugal on 19-20 May 2022. The Conference Co-Chairs are Prof. Cândida Silva, and Prof. Mónica Oliveira and the Programme Chair is Prof. Susana Silva, all from School of Hospitality and Tourism of Polytechnic Institute of Porto (ESHT/P.PORTO), Portugal.

ICTR is a well-established event on the academic research calendar and now in its 5<sup>th</sup> year the key aim remains the opportunity for participants to share ideas and meet the people who hold them. The scope of papers will ensure an interesting two days. The subjects covered illustrate the wide range of topics that fall into this important and ever-growing area of research.

The opening keynote presentation is given Dr. Luís Araújo, President of Turismo de Portugal on the topic of *Tourism: Time to act*. The second day of the conference will open with an address by Professor Marianna Sigala, University of Piraeus, Greece, who will talk about *Advertising Tourism During COVID-19: Marketization of compassion or re-setting tourism*.

With an initial submission of 128 abstracts, after the double blind, peer review process there are 57 Academic research papers, 7 PhD research papers, 3 Masters Research papers and 5 work-in-progress papers published in these Conference Proceedings. These papers represent research from Austria; Bulgaria; Canada; China; Cyprus; Czech; Finland; Greece; Ireland; Italy; Japan; Peru; Poland; Portugal; Romania; Slovakia; South Africa; Spain; Switzerland; Turkey; UAE; UK; USA; Vietnam.

We hope you enjoy the conference.

Prof. Cândida Silva, Prof. Mónica Oliveira and Prof. Susana Silva

The School of Hospitality and Tourism, of Polytechnic Institute of Porto  
Portugal  
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# Promotion of Destinations Through Interactive Digital Marketing: Collaborative Model for Smart Cities

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**Abstract:** Smart cities are, by nature, spaces with a richness and diversity of technologies incorporated in their physical spaces, in such a way that they can be seen as a single intelligent and collaborative space. As technological pillars, two important layers arise – the sensory layer and the actuator layer, both of which are strongly interconnected with each other, emerging as a large Internet of Things network. This scenario reveals an enormous potential for marketing science and for the creation of innovative strategies to promote territories as touristic destinations. Within the multiple opportunities, there is space for the development of an interactive marketing experience, revolutionizing, through creative rethink, the way destinations interact with their visitors, and make known all their potential. Although in the context of tourism, there are three main moments in the visit process – the before, the during and the after, this work focuses on the moment of the destination visit – the during. In order to understand how creative rethink can be carried out to create innovative strategies to promote touristic destinations, an introduction is carried out, substantiating the concepts of digital marketing, smart cities and Internet of Things. Then, the methodology that governed the creation of a collaborative model for smart cities is clearly defined, being contextualized the importance of destinations-communication, the concept of a smart city and some of the major technology that support this concept. After contextualization and methodological aspects, this article presents a conceptual model where its components are described and where it is discussed how the model can take advantage of the variety of technologies that exist in a smart city, in order to allow innovative digital marketing strategies and innovating in the interaction between the city and the visitant, and vice versa – the vision of interactive digital marketing. In the model discussion, some interaction-scenarios and their main benefits are highlighted, which serve as examples for validating the proposed model. Finally, we present the work limitations and mains conclusions.

**Keywords:** digital marketing, smart cities, model, collaboration, tourism

## 1. Introduction

The tourism industry has experienced tremendous growth in recent years, which is largely due to the rapid development of information and communication technologies (ICT) across the world, as well as the widespread use of the internet (Hassannia, Barenji, Li, & Alipour, 2019).

A territory without communication doesn't exist. This principle is structuring for any tourist destination, but it must be looked through new forms of tourism and communication. In an increasingly digitized world, the tourist has also become more demanding and that quickly led him to a smart tourism destination.

New ICT are the thread that guides tourists on their visit, allowing access to information in real time and the relationship in social networks, while allowing the interaction and integration of the visitor with the environment (Corrêa, de Sevilha Gosling, & Gonçalves, 2019).

In this new paradigm, focus must be on the tourist, considering their needs, preferences, requirements, trying to improve their experience and make them get the most satisfaction during their trip. The use of ICT in the context of smart cities allows access to databases that intelligently monitor the preferences of tourists, helping to improve experiences, local businesses, and public resources, adjusting them around tourism. Through Near Field Communication (NFC) technologies, for example, tourists can choose every detail of their destination (Beck, da Silva Neto, & de Melo Conti, 2020).

Being aware of these changes, tourist agents are increasingly betting on communication and marketing campaigns for smart cities, which implies linking the tourist experience to smart technologies, while becoming

more sustainable places to visit. The aim is to offer tools that allow the visitor to make their own planning and design their own itinerary, according to their profile (Pascoal, 2019).

The emergence of ICT has given users a new positioning, who are no longer mere receivers and are now also content transmitters and communication agents in public space (Sánchez Martínez, Barceló Ugarte, & Cabezuolo Lorenzo, 2017).

In the current context, in which efforts and investments have been made to develop smart cities, it is opportune to create synergies between the technological infrastructure inherent to smart cities and the different economic sectors of these cities, in particular the tourism sector. This will allow the tourism industry to evolve towards a new paradigm called Smart Tourism.

This article, after this brief introduction, it provides a context of exploring a tourist destination and reflects how smart cities can enable smart tourism, highlighting the role of ICTs and the need to evolve the way tourist destinations are promoted. After review of the state of the art, a conceptual model is proposed, and some applicability scenarios are also discussed. Finally, a conclusion of the research work carried out is made.

## **2. Exploring a tourism destination**

Tourists' behaviors always take place in time and space and consequently, understanding their space and time behavior like tourist activities, places visited, the time they spend and the facilities and services they use, can give several contributions to build a smarter destination.

In investigations on spatial and temporal behavior of tourists at visited destinations, a set of modern methods and techniques have been used, as Global Positioning System (GPS) devices, telephone tracking system, business cards/passes, hybrid solutions, smartphone applications, Bluetooth tracking, georeferenced information shared on social networks, among others. All these techniques are efficient, accurate and allow high-resolution spatiotemporal information to be produced that can be used to influencing destination planning and management (Ferrante, De Cantis, & Shoval, 2016), namely controlling tourist flows, promoting their dispersal (Le-Klähn, Roosen, Gerike, & Hall, 2015), locating new attractions or new accommodation (Lew & McKercher, 2006) and identifying which routes are most used (Xia, Zeepongsekul, & Packer, 2011).

In an urban destination, travelers try to visit several attractions and engage in several activities according to the space-time budget available (Caldeira & Kastenholz, 2019).

According to Lew & McKercher (2006) is important to understanding tourist intra-destination movement patterns and to identify the major influences on such movement. Caldeira & Kastenholz (2019) gave a relevant theoretical contribution on the study of tourist's space-time behavior at the urban intra-destination level with a two-dimensional structure based on movement and multi-attraction visitation making possible to describe and analyze tourist's movements, contributing for a smarter destination. It is important to note that tourism destinations serve different roles for tourists and, consequently, tourists consume destinations differently (McKercher et al., 2006, p.647). It is possible to consider the existence of three main moments in the visit process to a destination – the before, the during and the after. All these phases have a different effect on the way destinations are consumed.

Before the trip, the sources of information consulted or the fact that the destination is being visited for the first time will have an impact on the extent of the movements that will be made and on the type of attractions to visit, spending different amounts of time at the same attractions (McKercher, Shoval, Ng, & Birenboim, 2012). In the case of repeat visitors there will be a tendency to perform activities such as shopping, visiting friends or family, among others (Lew & McKercher, 2006).

The literature on tourist destinations refers not only to the territory where tourism activity is developed, but also to a set of other elements such as support services, accommodation, attractions, tourism products, among others, which provide the needs of visitors and residents (Inskeep, 1991; Leiper, 1979). A smart destination should provide the interconnection of all those elements, and among them, transports are a critical element. According to Lew & McKercher (2006), the zones and trip generator points are in areas where there is a greater concentration of accommodation, consequently, visitors will select the mode of transport taking in

consideration the perceived costs and benefits of traveling on it. In some urban destinations and for those using transport networks for the first time, could be a very complex and difficult task.

For a more efficient exploration of the destination and for a more rewarding visiting experience it is crucial that tourist be aware of the attraction's location, accommodation and how transports network connect all those elements. A smart destination should provide the visitors with all the necessary information to support and simplify the exploration of the destination according to their profile.

As "the tourist's ability to understand a destination and choose what activities to pursue is highly individualistic, though subject to considerable external influence" (Lew & McKercher, 2006, p.411) all these variables contribute to explain how destinations are explored and consumed in time and space giving significant contributions to their marketing and promotion strategy.

### **3. Smart cities enable smart tourism**

Currently, most of the world's population resides in urban areas, and the forecast is that this urbanization movement will continue. The projected proportion urban in 2050 is expected to reach close to 87% in the more developed regions and 66% in the less developed regions (United Nations, 2019).

This transformation creates several challenges in urban areas, and the smart city concept emerges as a strategy to mitigate the problems that arise from this rapid urbanization. Thus, Smart Cities can be seen as one of the ways to improve the quality of life of people and services in urban environments (Kong et al., 2019).

#### **3.1 Smart cities**

The smart city concept, in addition to being seen as a strategy to respond to the challenges that cities face, such as: increasing urbanization and demographic changes, also intends to respond to climate and environmental changes, economic reforms, and digital technology disruptions (Zhao, Fashola, Olarewaju, & Onwumere, 2021).

Smart cities, are urban areas that, with ICT resources, collect data from devices, assets and citizens, to improve the management of available resources more efficiently (Habeeb & Weli, 2020), and provide an intelligent, connected infrastructure.

A smart city is a structure composed largely of ICT, to develop, implement and promote sustainable development practices to respond to the growing challenges of territories urbanization.

ICTs such as big data mining, Internet of Things (IoT), mobile internet and cloud technologies, embedded in urban development, largely leverage the construction of smart cities (Kong et al., 2019), being that, distinct combinations of technological infrastructure interact to form the set of smart city technologies, and may present different levels of interaction between human and technological systems – ICT represents the essential backbone to connect main systems of smart cities.

The growing development of smart city initiatives has been driven by both the omnipresent use of ubiquitous computing and mobile solutions allowing a constant exchange (send and receive) of data between citizens and the smart city system (Quijano-sánchez, Cantador, Cortés-cediel, & Gil, 2020).

#### **3.2 Smart tourism**

The fourth industrial revolution has provided the development of the economy in general and the tourism industry in particular. In this context, many cities have made efforts to develop a smart tourism ecosystem based on existing smart city technological infrastructures to leverage their tourism competitiveness (Lee, Hunter, & Chung, 2020).

The concept of smart tourism destination is the result of two converging trends: on the one hand the unstoppable dissemination of "e-Tourism", on the other hand the opportunities generated by the adoption of the smart city paradigm to optimize the use of tourist resources, enhance tourist experiences, increase the competitiveness of destinations, and improve the quality of life of citizens (Baggio, Micera, & Chiappa, 2020). In the same sense, according Lee et al. (2020), smart tourism represents the convergence of ICT and tourism,

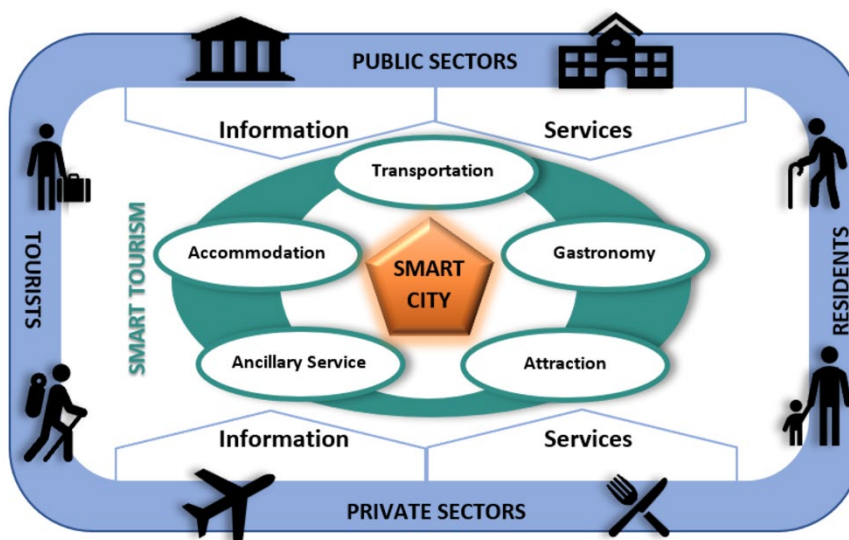


driving the transformation of tourism through technology, resulting in a new paradigm of sustainable tourism based on the collection and analysis of data extracted from diverse sources, and combining diverse and advanced information technologies to transform travel experiences to make them more enriched (Lee et al., 2020).

The IoT presents a set of new opportunities for the tourism sector by facilitating the access and integration of a wide set of information, with the possibility of integrating social media, content marketing, big data and wearables. As such, the interaction of tourists with these technologies will make it possible to transform the visitor's experience, from the production of knowledge to the exchange of knowledge (Wise & Heidari, 2019).

The authors Lee et al. (2020) propose a framework, figure 1, that provides an abstract view that summarizes the components of a smart tourism city. This framework allows information and service transactions can be seen as a result of data sharing between the public and private sectors, with visitors and residents playing a significant role in providing and receiving that information.

A smart tourism city provides intelligent services to visitors in terms of transportation, gastronomy, accommodation, ancillary services, and attractions throughout three phases: the pre-travel (planning) phase, the travel (onsite) phase and the post-travel phase (evaluation) and embrace the the components of the smart city.



**Figure 1:** Components of a smart tourism city. Adapted from: (Lee et al., 2020)

Tourism, in the context of Industry 4.0, as the new tourism value eco-system based on the high-tech service, embraces a set of principles such as, interoperability, virtualization, decentralization, real-time data gathering and analysis capability, service orientation, and modularity (Pencarelli, 2020).

### 3.3 Interactive digital marketing to promote smart tourism

The new technologies transform data into valuable marketing information that can profile tourists' consumer behavior and expectations. In this way, fine segmentation processes are put into action and personalized value proposals are offered, so as to improve travel experiences, make them unique and truly memorable, and foster traveler loyalty (Pencarelli, 2020). Technological advances have also led to the evolution of marketing and fomented marketing to act based on big data and AI to make a difference (Chintalapati & Pandey, 2022).

Considering the three main moments of a tourist travel (Lee et al., 2020), tourist agents act essentially in 3 moments: before-trip, when the internet and social networks attract the tourist to a certain destination, during-trip, when the trip is fed through mobile devices and their applications powered by the technology, and post-trip, when positive reactions on social networks and sharing experiences end up stimulating the interest of other visitors (Wichels, 2018).

IoT and IoS (Internet of Services) allow objects and services to be connected with sensors and cellular telephones in a common network, that enables the service vendors to offer value proposals to clients via the Internet and

the ability of AI to continually learn and interpret/predict customer purchase intentions and emotions, could facilitate the automation and personalization of marketing (Chintalapati & Pandey, 2022).

At the same time, new dissemination platforms have become new databases, which allow measuring the behavior of tourists, such as social networks (e.g. Instagram, Facebook, Twitter), or online consumer assessment services (e.g. TripAdvisor), being important sources of information due to the high levels of participation and the amount of information generated (Encalada, Rocha, & Ferreira, 2018). Increasingly, the tourist is a generator of information, taking advantage of the digital trail they leave when using social networks.

Tourism promotion thus also passes to the side of the visitor, who gains visibility as an influencer, by sharing their experiences through photographs, opinions, recommendations, and evaluations on different digital platforms.

Nowadays, marketing is ever more data-driven, automated, in real time and intelligent, in order to offer value-added products and services that meet consumers' needs and expectations. Thus, Marketing in the context of smart tourism should initially focus on attracting visitors, then, during the stay, it should understand the tourist's behavior in real time and make suggestions appropriate to their profile, and finally, it should make efforts to loyalty and encourage new visits.

#### 4. Proposed conceptual model

Smart cities contribute to the development of tourism as, according to Eichelberger, Peters, Pikkemaat, & Chan (2020), they tend to attract more visitors. Smart cities/destinations bring together physical and technological infrastructure to create seamless experiences for tourists; however, the roles and functions of Destination Marketing Organizations remain meanly understood (Sorokina et al., 2022).

As the concept of a smart city is very comprehensive, we are focused on understanding a smart city as a large network of cooperation with different layers (e.g. technological, business). In this context, we propose, in figure 2, a conceptual model that materializes our focus, and that explores the potential of using marketing mechanisms to increase the degree of visitor satisfaction, while generating business opportunities and improving the response efficiency of that same business – a destination that understands the visitor and adapts to their needs.

The proposed model, figure 2, is based on four main dimensions: (a) the visitor, (b) the technological infrastructure of a smart city, (c) information and, finally, (d) business.

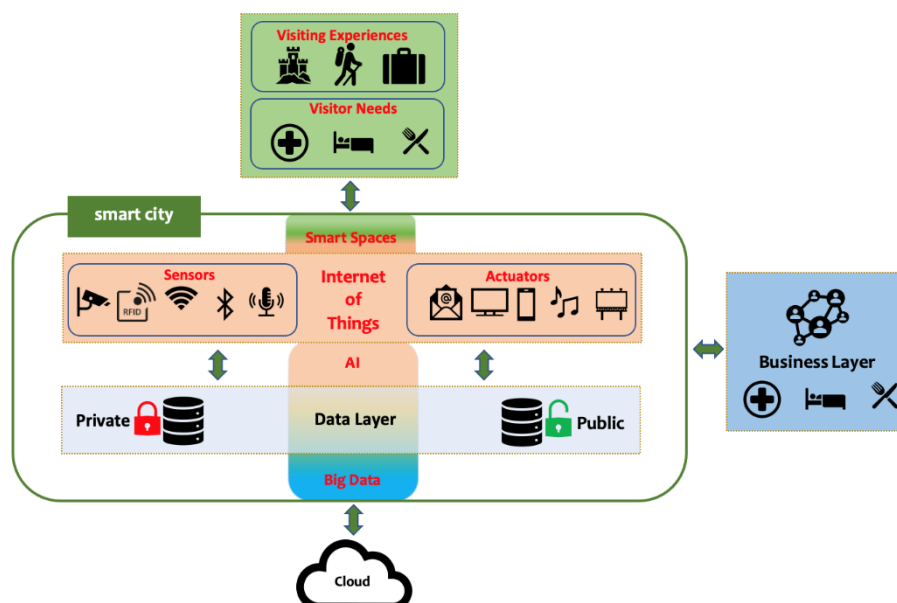


Figure 2: Conceptual model components

- a) The dimension of the visitor materializes the needs that a visitor has during the process of visiting, a city, as a tourist. In this context, the visitor seeks a set of vast experiences in the field of understanding and fruition of all touristic and cultural aspects of the city. This experience must be compatible with their (pre-formed) expectations, where the technological element must be increasingly present - the visitor is thirsty for information and wants it to be easy to access, as well as access to services to be easy, convenient, and contextualized. Contextualization plays a major role in the tourist satisfaction – contextualized experiences lead tourists to feel embraced and welcomed by the city.
- b) The creation of smart cities implies embedding technology in physical spaces, thus enabling a virtual dimension - the creation of smart spaces. In a succinct view, smart cities have two major hardware layers: a sensor network and a network of actuators interconnected by a wired and wireless communication infrastructure. The sensory layer is responsible for identifying and perceiving objects (e.g. a visitor, a given scenario), the actuator layer is responsible for distributing information and/or allowing access to services. In a reductive way it can be said that the sensors allow the input of data and the actuators the output of data. However, it is in the process that intermediates this cycle that a key differentiating element is found - an intelligence unit supported by AI. This dense network is commonly accommodated on the IoT concept. It is important to point out that this layer is really successful thanks to the visitor having technology (e.g. smartphones, tablets, smart watches). We call it true success because this reality allows the visitor (through the technology he carries) to be, like the space, an intelligent visitor – the visitor himself has a layer of sensors and actuators.
- c) The information layer is the lifeblood of a smart city. Note that all embedded technology and all AI processes are powered by information. The existence of information is in this sense the great primary success factor. In the model presented, the information must be divided into public information and private information. In our opinion, public information translates the information that circulates symbiotically among all the actors of a smart city. As for private information, this translates the proprietary information of a given actor (or cooperative set of actors) and which typically serves the purpose of generating differentiating factors of competitive advantage. This view of information divided into public and private is the support of the environment of cooperation and competition that exists in the dynamics of business. In the model, the information inside and outside the smart city is differentiated. Note that this is a logical and not a physical distinction - that is, it does not matter where the information is physically stored, but we distinguish between the information held by the smart city (e.g. recording of interactions between the visitor and the smart city) and the information that is owned by elements outside the smart city (e.g. a visitor's Facebook profile). In this context, the smart city cannot be an island of information but a node of information that is part of a wider distributed system, and in this scenario, the true concept of Big Data can be glimpsed. All this information is continuously worked on by AI processes that generate knowledge and allow the optimization of the sensing and action cycle towards the visitor, the city's infrastructures, and the business layer.
- d) The business layer, presented in our model, in the context of a smart city, in our opinion, must necessarily be a cooperative network vision. The sharing of information, interconnection of the layers of sensing and actuators, and the performance of each business player must be a reality, otherwise we would be undermining the potential of a smart city to leverage the generation of business opportunities and for each business to maximize the relationship with the clients. The city's ability to communicate to its business actors the visitors who are in the city and, step by step, what their activities are going to be, allowed the business actors to anticipate needs, as well as to promote, among visitors, their offer.

After describing the different layers of the proposed conceptual model, the following chapter presents some scenarios that take advantage of the model in the pursuit of a contextualized interactive marketing approach and the way in which both visitors and business actors can take advantage of the model – an exercise of realization of the concept into the real world.

## **5. Discussion and scenarios of application**

In order to highlight some of the gains of the proposed conceptual model, two scenarios are presented below to demonstrate some use cases that make proof of concept.

### **5.1 Scenario 1 - customize, to the visitor, the access to information or services:**

The IoT network makes it possible to detect the visitor and various aspects, both in terms of their profile and even in terms of various biological parameters in real time. In this context, we give the following example: A visitor who is in a queue to enter a theater will be detected by the IoT system (i.e. sensor component), if his profile reveal that he is a visitor with priority (e.g. elderly person, pregnant, or in another context, a VIP) then the same IoT (i.e. component of actuators) will trigger an action in order to alert the visitor so that he can immediately enter the said theater and lead that visitor to a place more suited to his condition. This will generate satisfaction in the visitor who will feel cherished and respected.

### **5.2 Scenario 2 - generating business opportunities and personalized marketing:**

The IoT layer allows the identification of a visitor and the AI applied to Big Data will allow to obtain information about the visitor. In this way, it will be possible to understand the visitor's profile, as soon as the sensory system detects that same visitor. Accordingly, we show (a possible example) how two possible visitor profiles can be obtained - backpacker and luxury visitor; and how this differentiation can generate personalized business opportunities. If we detect a visitor, we can check if there is an accommodation reservation for that visitor. If the reservation is in a cheap hostel or if, on the other hand, it is in a five-star hotel, the characterization of the visitor profile will tend, in the first case, to be closer to a backpacker and, in the second case, it will tend to be that of an affluent visitor luxurious. The first profile will lead to the contact of several business actors aimed at backpackers, while the second case will trigger the contact of business actors with a range of luxury services. It is, in our opinion, sensible to estimate that the second profile will advertise luxury recreational opportunities (e.g. a tour of the city in a limousine) and for the first profile low-cost recreational opportunities (a walking tour through the city with a tour guide for tourist groups). This segmentation will favor marketing processes adjusted to the visitor's profile, by the various business actors. Once again, each visitor profile will feel a maximization of the satisfaction with which the system interacts with him – only offer me the right service not what I don't want.

Many more scenarios could be considered and would be correctly supported by the proposed conceptual model. There is actually a set of opportunities only limited by the imagination to innovate in the way we approach visitors, offer them services and accompany them during their visit. Our scenarios and model are aligned to the results and trends showed in (Kontogianni & Alepis, 2020), where a smart tourism state of the art and literature review between 2013 and 2019 was made.

## **6. Conclusion**

Tourism is a global phenomenon and one of the sectors that currently has a significant weight in the economy of the territories, having gained more and more importance for the generation of wealth. However, this sector is information intensive and depends on a great diversity of ICT, as well as the way they are implemented and interconnected – in this context, smart cities come to materialize these necessary technological resources.

As such, smart cities have technology capable of collecting and processing data massively and in real time, to support intelligent and contextualized action mechanisms, in the context of different scenarios.

Based on a smart city, the opportunity arises for business reengineering, allowing companies from the most diverse sectors of activity to create collaborative networks that, taking advantage of the generated synergies, can thus compete and cooperate in a more favorable and symbiotic environment. Among the multiple sectors, in particular, the tourism sector will be able to take advantage of this reality to reinvent the way it is able to proactively understand, welcome and meet the needs of the visitor – smart tourism.

Accordingly, a model is proposed that, taking advantage of the ability to gather and intelligently process visitor information, obtained from their digital footprint and their real-time behavior during the visit, achieving gains in competitiveness, through the cooperative vision between the smart city and the business layer (also this cooperative), maximizing visitor satisfaction, as well as generating new business opportunities.

Some applicability scenarios were presented that illustrate some use cases, with the purpose of proof of concept.

Finally, it is important to mention that the model's vision has some limitations, of which we highlight the degree of difficulty that sometimes exists in the creation of cooperation networks between business actors; obviously, the dimension of data security and privacy is also essential, however, this was not considered in this work, being the subject of future work.

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