Smart cities and tourist Experiences

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***Abstract*—**To be competitive, cities and destinations are using smart technologies to enrich the visitor experience. This paper aims to explore how technology affects the tourist experience in smart tourism cities to provide insight into its impact. To understand how the smart city; through information and communication technologies; can facilitate personalized experiences through smart solutions, we adopted an exploratory approach through a questionnaire, administered to tourism stakeholders and tourists. Results confirm positive relationship between smart technology and tourism experience. Cities are called to invest more in smart technology to improve the quality of life of residents and offer visitors personalized and remarkable experiences. This study will help actors in cities and destinations to understand the true contribution of smart technology to create value in the tourism experience and implement measures to improve it, increasing visitor satisfaction and loyalty.

Keywords*—*Smart technology, Smart cities, Smart tourism, Tourist experiences, ICTs

I. INTRODUCTION

In recent years, smartness has become a paradigm in theoretical and practical research. It appears as a label applied to technologies, cities, tourist destinations and all aspects of human activity. It is defined as a sophisticated technological framework integrated into cities to improve the well-being of residents and visitors [1]. Technological evolution is a major factor of change that has altered consumer behaviour and forced cities, tourist destinations and businesses to adapt. Intelligence is based on the massive use of information and communication technologies (ICT). Thus, the tourism industry has entered the age of smart tourism, where smart technologies are now widely used. Smart destinations are based on the implementation of advanced technological tools and offer the opportunity to explore innovative solutions for creating memorable experiences for tourists in a space of co-creation within the destination.

Smart cities must have a number of attributes: smart living conditions, a smart environment, smart citizens and smart governance. These attributes make cities sustainable, liveable and developed. Therefore, a smart city is an established, liveable and interconnected ecosystem.

The use of ICTs by cities affects many aspects of city life, including their effects on tourism. Smart cities use ICTs to improve the well-being of the local population and offer visitors personalized experiences. In this context, the intelligence approach has become a concept that reflects the emerging nature of cities as centres of knowledge, information management, technology and innovation [2]. It is important to concentrate on tourism, because it is a source of revenue for many economies. The smart tourism city offers tourists a framework to use technology that facilitates interactions and movements inside and outside the tourism industry.

ICTs can improve tourist satisfaction by providing them with relevant and dynamic information that can make their urban experience more interesting and fascinating. This paper aims to understand how technology affects the tourism experience in smart tourism cities. To meet this need, we will first present a theoretical framework highlighting the different key concepts. Second, we present an empirical framework highlighting the methodology used and the results and discussion of an empirical study showing the impact of smart technology on tourist experiences.

II. THEORETICAL FRAMEWORK

A. Smart City

The conceptual dimensions and the implementation of the smart city are determined by the vision of policymakers and the characteristics of each country,

but the common factor is the use of intelligent information and communication technologies [3]. This integration makes the city smart in all its aspects: economy, transport, environment, lifestyle and administrative management. It also improves these areas with innovation [4]. Some researchers define the smart city as an interconnected space, using technology and data management to achieve greater efficiency in its functioning [5]. For other researchers, the smart city is an urban area combining accessibility, governance, sustainability and human and social capital [6].

Challenges posed by the management of large cities have contributed to the development of smart city ideas. This concept covers a number of areas, including tourism [7]. In this sense, some authors see the smart city as a territory equipped with a technological infrastructure to increase economic prosperity, facilitate resident involvement, promote social development and optimize the operations of public authorities [8]. The transformation into smart cities is an investment in human and social capital, using new technologies to promote sustainable economic growth and a high standard of living. [8]. Smart cities are becoming interconnected, liveable and sustainable urban areas. They strive to introduce innovations to enhance the visitor experience, attract more tourists, improve economic efficiency and enhance the quality of life of residents [9].

For several authors, smart cities are characterized by smart conditions for living, a smart environment, smart citizens and smart governance. These attributes make cities sustainable, liveable and developed [10]. Consequently, the smart city is an interconnected ecosystem where tourism is essential [11].

B. From smart city to smart tourism city

The smart city and smart tourism are two closely related concepts because of their common characteristics. Indeed, the two concepts require infrastructures and facilities that offer solutions to residents and tourists alike. However, there is a difference between the two: Smart cities focus on benefiting their inhabitants, while smart tourism focuses on visitors. For some researchers, a city is considered smart if it has the following characteristics. For some researchers, cities are considered smart if it has the following characteristics [12, 13, 14]:

- Management efficiency: Smart cities create an environment and an autonomous management system. They focus on the digital involvement of residents in management and development processes.
- Improve local competitiveness: Smart city players optimize the use of available resources through digital technologies.
- Systemic socio-economic efficiency: Smart cities save resources, increase the rational use of nature, reduce the environmental impact, and guarantee the optimization of local management decisions.
- Creating a business-friendly environment: smart cities reinforce the competitiveness of local players and attract creative human capital to the economic environment of the region through targeted initiatives.
- Increasing the digitisation level of the region: Smart cities implement cutting-edge technologies, making it easier to establish communication relationships with foreign investors, providing them with the necessary information.
- Increasing the attractiveness of the territory in terms of investment: In the smart city, business start-up procedures are characterized by simplicity, transparency and rapidity, as well as by the automation of commercial processes.
- Providing the territory with complex infrastructures: Smart cities introduce new approaches, new technology and digital infrastructure tools and the stimulation of the development of all innovative infrastructures aimed at increasing creative capital.

Smart cities have crosscutting and interacting preoccupations, particularly in tourism. Many aspects can be influenced by smart city measures. The use of Big Data, artificial intelligence and the Internet of Things can improve transport efficiency, health services, sustainability and the tourism experience.

Tourism must be able to use technology to help make better use of resources and manage destinations more efficiently and sustainably [4]. The vision of the intelligent city as a global approach has been transferred to the intelligent destination as an ideal destination [12]. On a worldwide scale, the development and communication processes of cities have changed and become smarter due to the rapid development of technology. Many researchers have defined the term smart city by focusing primarily on the connectivity thanks to ICTs, which enhances sustainability, environmental friendliness, the standard of living of residents and tourism experiences. In parallel with the interaction between ICT and tourism, the tourism industry has developed in technological, economic and social levels. The objective of smart tourism is to create a synergistic relationship between tourists and residents, while creating economic and social value [13]. The use of smart tourism services on the infrastructure of a smart city creates strategic synergies and implications for the tourist, the company and the destination. For some researchers, the principal objective of smart cities is to generate significant benefits for tourism by offering effective solutions for energy management, improved mobility and social policies that guarantee safety and well-being in the city and enable sustainable development [14, 15]. Smart city governance enables

smart tourism to profit from the infrastructure and environment that promotes innovation.

Smart tourism cities have a much broader customer base and foster an intelligent and dynamic business ecosystem. Smart tourism cities offer many opportunities and benefits to travellers, businesses and destinations. The smart tourism city offers visitors a framework for using technology to facilitate interactions and travel. Visitors are searching for authentic and creative experiences that can be highly personalised.

Combining smart cities and smart destinations improves the tourism experience. It offers new business opportunities. The definitions of smart cities have been dominated by two different positions. On the one hand, the intelligent city is an interconnected place, technologically mediated and based on data management in order to achieve greater efficiency in its management [16]. On the other hand, the smart city is considered in a holistic way by several authors [17].

Table 1. Conceptualization of the smart tourism city

	Smart City	**Smart tourism city**
Scope	Residential	Holistic
Desired Outcome	Quality of Life	Well-being
Enabling Concept	Governance	Convergence
Driver	Efficiency/ Sustainability	Synergy
Focus	Habitual Consumption	Liquid Consumption
Timeframe	Continuous	Fluid

Source: Gretzel et al. (2021)

C. Smart technology and tourist experiences

According to Gretzel, Smart tourism cities deliver improved experiences for tourists and a better quality of life at the destination through technological infrastructure that provides critical data for co-value creation within the smart tourism ecosystem [18].

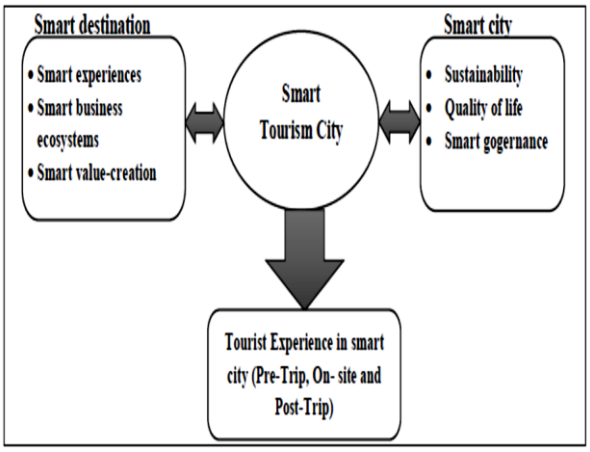

Figure 1. The smart city and the tourist experience[19].

Tussyadiah and Fesenmaier have shown that technology can play the role of mediator or intermediary of the tourism experience. Their research reveals that online videos shared by users provide mental pleasure by stimulating the fantasies and dreams of those who watch them [20]. Other technology, such as smartphones could also play this role of mediator of the tourist experience by influencing at the emotional level the users [21]. The use of intelligent tools made it possible not only to meet the information needs of travellers, but to enrich their experience, maximize their travel experience or facilitate their experience [21].

Tourists not only use technology to meet their information needs, but also for social, hedonic and emotional reasons [22]. Technology is therefore becoming increasingly important as a mediator of tourism experience in each phase of the experience [23].

The literature review identified many benefits of using smart tools for tourism experiences. The most important are:

- The technological infrastructure allows easy and real-time access to data and information and makes it possible to quickly identify the needs of consumers and reach potential customers with complete information, customized and updated and find new ways to meet consumer needs (UNWTO).
- In a technological environment, tourists are better informed, more demanding and autonomous, and can play a more active role in the planning, design and specification of services and products [24].
- Technological tools open up new avenues for relations between players in the tourism supply chain, and new management solutions that improve these relations [25].
- The technological tools allow an intensive exchange of information between companies operating

in the same distribution channel has led to greater efficiency, while the increased exchange of information highlights common interests and common objectives, which facilitates collaboration [26].

- The use of technology enables close relationships between suppliers and customers, differentiating and improving their products [27].
- The use of smart devices allows the promotion and direct distribution of tourism products to consumers. It also reduces dependence on intermediaries and sales commissions paid to them, and provides direct and almost free access to information [28].

Several researchers listed the attributes of smart tourism technology as shown in table 2.

Table 2. The attributes of smart tourism technology

Attributes	**Authors**
Accessibility	Pai, Liu, Kang, and Dai (2020)
Informativeness	Lee and al. (2018), (Pai et al. (2020)
Interactivity	Huang and al. (2017), Gretzel, Sigala, and al. (2015)
Personalisation	Buhalis & Amaranggana, (2015)
Security/privacy	Huang and al. (2017), González-Reverté, Díaz-Luque, Gomis-López, and Morales-Pérez (2018), Huang and al. (2017), Xiang and al. (2015).

III. METHODOLOGY

The aim of this paper is to examine the effects of the use of technological tools and smart infrastructure on the improvement of the tourism experience. Our research approach is part of an exploratory logic.

To understand how the smart city; through information and communication technologies; can facilitate personalized experiences through smart solutions, we adopted a quantitative approach through a questionnaire, administered to tourism stakeholders and tourists.

The concepts and elements of the questionnaire were developed from variables or their indicators taken from the literature. They were modified to reflect the objective of the study. Thus, the attributes of smart technologies selected in this study are those identified by the literature review, as shown in Table 2.

To make the responses more relevant, we opted for a Likert scale with a five-point continuum, enabling the respondent to confirm or deny the existence of such an impact and to measure its intensity (Strongly disagree, Somewhat disagree, Agree, Somewhat agree, Strongly agree). The advantage of these scales is that they considerably reduce confusion in responses and are more amenable to quantitative analysis. Their responses can be considered as quantitative or metric variables and can be statistically processed.

The people concerned by the study are tourism professionals (hoteliers, restaurateurs, car rental companies, travel agencies) and tourists visiting the Moroccan destination (table 3).

Table 3. The breakdown of respondents.

Type of tourist operators	Numbers
Hosting	20
Tourist transport and car rental	10
Restoring	10
Travel agency or tour operator	10
Tourists	50
TOTAL	100

IV. RESULTS AND DISCUSSION

Table 4: Results for tourism stakeholders and tourists

Tourist Operators	**Mean**	**Standard deviation**
Hosting	**4,95**	**0,09**
Tourist transport and car rental	**4,80**	**0,29**
Restoring	**4,30**	**0,42**
Travel agency or tour operator	**4,90**	**0,18**
Tourists	**5,00**	**0,00**

The results of the research allow us to conclude that the use of smartness helps to shape the tourism experience by setting up a new scenario for the management of tourist destinations, which requires different management approaches, the most notable being the smart destination management approach.

By using smart technologies and devices, tourists can plan their own trips without intermediaries. They can communicate directly with other tourists and tourism marketers to make better travel decisions. Smart technologies facilitate the consumption of tourism products. They make it possible to book flights and hotels on mobile platforms. Smart technology also makes it easy for tourists to obtain the information they need about accommodation, transport and destination attractions.

For tourism stakeholders, the attributes of smart technologies improve the tourism experience, with moderate averages. Thus, for hosting (Mean: 4,95 Standard deviation: 0,09), Tourist transport and car rental (Mean: 4,80 Standard deviation: 0,29), Restoring (Mean: 4,30 Standard deviation: 0,42), Travel agency or

tour operator (Mean: 4,90 Standard deviation: 0,18). As already mentioned by Berné, intelligence tools facilitate management, these tools are used by all hierarchical levels. They also create a new framework of relationship between the visitor and the host structure. It has opened up new avenues for relationships between players in the tourism supply chain, and new management solutions that strengthen these relationships. The density of information exchange between companies operating in the same distribution channel has improved efficiency, as intensified information exchange highlights shared interests and common goals, which facilitate collaboration [25].

For tourists, smart technology is present in all stages of the pre-tride, on-site and post-tride experience. It is considered a multidimensional construct and assesses its effectiveness for destinations [29]. Based on four attributes: accessibility, informative content, interactivity and personalization. Accessibility is a set of measures that enable tourists to obtain and use online tourist information. It is a crucial element in the co-creation of tourism experiences. Accessibility is the most significant factor influencing both the experience of using smart technologies and tourist satisfaction. Information such as the volume, frequency, veracity and accuracy of the information. The informative nature minimizes the time and effort required to search for information [30]. It increases the satisfaction of tourists with their experience. Interactivity represents the extent to which intelligent technologies can actively provide visitors with information in real time. Personalization makes it possible to offer tourists proposals adapted to their needs. Guaranteeing personalized services in smart destinations is an effective way of optimizing the tourism experience, by enabling destinations to adapt the information they provide to the various stakeholders [31].

Conclusion

The technological revolution has radically transformed the tourism industry, enabling tourists to enrich and create memorable tourist experiences. Smart technology is the basic infrastructure that integrates several components (hardware, software and networks, travel services and ICTs) to provide the information in real time that facilitates intelligent decision-making by destination stakeholders. It comprises a range of innovative tools and solutions (internet of things, cloud computing, artificial intelligence, mobile devices and applications, big data, Wi-Fi, virtual reality, augmented reality, chatbots, wearable devices, QR codes, proximity, field communication, radio frequency identification, social networks and tags) that promote the autonomy of visitors and mark their experiences. Overall, the smart technology tools encompasses a wide range of applications that can enrich visitor experiences while generating additional value. Thanks to their wide reach, useful information, the smart technology tools is an increased flexibility and decision support; it can facilitate a smoother and more enjoyable travel experience. Thus, cities are called to invest more in smart technology to improve the quality of life of residents and offer visitors personalized and remarkable experiences.

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