Addressing Smart Technology Involvement in Cultural Tourism

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Abstract: Smart tourism is a personalized experience that takes advantage of smart city infrastructure to provide increased visitor and service opportunities. In order to have effective smart tourism there is a need for possession of personal mobile and geographic localization systems as well as intelligent applications to provide the appropriate information at the time and location of the visit. However, in order to provide effective smart tourism, it should be taken under consideration the different requirements of users at different stages of their visits, as well as the interests and requirements of users, that do not differ only from user to user but may vary over time for each individual user.

Key words: smart tourism, smart cities, smart heritage, smart culture

JEL codes: Z

1. Introduction

Recently, smart technologies as well as the digitization of cultural resources have increasingly been seen as overlapping value-added products and services in areas such as cultural heritage and tourism (Graziano, 2014).

Today, new tools for cultural tourism have emerged, such as e-commerce sites, mobile systems, and social media platforms. Contributing and offering better opportunities for travelers to organize their vacation, learn and discover unknown resources of a location or tourist area, discover traditions, food, arts, history and quick access to available services (D'Amico et al., 2013).

Today, smart tourism applications are widely used, as the tools and applications of information and communication technology (e.g., mobile devices) are widespread. People with these smart tourism services can interact with cultural objects, share and generate data. They may also require useful personalized services to improve the quality of their cultural experience (Chianese & Piccialli, 2016; Tri Nguyen et al., 2017).

This research aims to explore the prospects of smart tourism and especially cultural tourism. This investigation takes place in three phases. In the first phase, interviews are conducted with a selected sample of potential tourists with open-ended questions, in order to explore possible directions in which cultural stakeholders

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should be guided. In the second phase, a questionnaire with closed-ended questions is developed, in order to specify and evaluate the factors that positively affect the tourists of culture in a possible visit to a "smart" cultural site/event and in order to specify and evaluate the factors detected in first phase. In the third phase, different groups of tourists are compared based on the answers, in order to determine a possible correlation between the prospects of smart cultural tourism and the characteristics of different groups of tourists. In the context of this work we have dealt only with the first two phases, while the transition to the third phase will take place in future work.

2. Theoretical Background

In the 21st century society has experienced one of the most important changes. That of the proliferation of technologies, information and communication. In recent years these technological developments have had an impact not only on society, people and businesses but also on everyday living conditions (Koo et al., 2015). As reported by Boes K., Buhalis and Inversini (2016) both societies and economies are subject to continuous change. These changes were never more intense and so rapidly evolving as they have evolved in recent years (Porter & Heppelmann, 2014) and the global forces affecting the world today have never been more complex and aspects of society have not been affected as much as Our Days (Dedehayir, Ortt, & Seppanen, 2014). Today's societies tend to evolve constantly and always according to the existing world powers and use this mutation as an advantage.

Smart technology is becoming more and more popular nowadays and refers to technological, economic and social developments that are based on smart technologies and are based mainly on sensors, large-scale and capacity, data, information and new ways of interconnection and feedback between people. and computers. The mobile revolution and specifically the role of smartphones (smartphones) give people many opportunities to shape their experiences differently than in the past (Wang et al., 2012).

Advances in technology can further push the boundaries of the data that can be collected and the ways in which it can be utilized, presented and finally experienced. The evolution of technology, the interconnection, synchronization and coordinated use of different technologies, can help to create an environment that is considered intelligent (Gretzel et al., 2015a; Gretzel U. et al., 2016).

Initially, the internet was considered a huge global library for people. In the mid-1990s, new horizons opened up in the operation of the internet in addition to passive reading and finding an interactive relationship that paved the way for many new social media applications. The web is now a place where three billion users interact with billions of pages and numerous software. At the same time, World Wide Web extensions were developed and expanded, with more and more friendly machines and computers, supporting the publication and "consumption" by software agencies of globally connected data published on a semantic web. As a result of all these developments, the web has become a collaborative space for natural and artificial intelligence (Gandon F., 2019).

Artificial Intelligence is a popular field of computer science as it has improved human life in many fields. In the last two decades it has significantly improved the efficiency of production and service systems (Pavankumar, 2016).

The application areas of Artificial Intelligence have a huge impact on various areas of life, as the specialized system is widely used today to solve complex problems in various areas such as science, engineering, business, medicine, weather forecasting. Areas using Artificial Intelligence technology have seen an increase in quality and efficiency (Pavankumar, 2016).

Smart technology includes smart computers/devices with hardware, software and network technologies to be able to provide real-time real-world perception to help people make smarter decisions and provide new business solutions. procedures and performance (Washburn et al., 2010).

The Internet of Things (IoT) is an example of two-way computing where everyday objects are connected to the Internet. This connectivity is technically supported through the integration of devices with limited resources, including sensors and actuators. This allows intelligent systems to receive information from the physical world, process that information, and perform similar actions in the physical world. The benefits of the Internet include effective resource management, increased productivity and increased quality of life of human populations (Gomez C. et al., 2019). Therefore, the Internet is a fundamental factor in smart environments (Cook D. J. & Das S. K., 2007) such as smart homes, smart health, smart cities and smart factories, among others. Indeed, the smart-x trend promises to revolutionize most types of human-related activities.

Advances in many technical areas enable the use of IoT and smart environments, including multiple communication solutions for IoT devices, which fall into two main families: (i) radio frequency identification (RFID), intended primarily for (ii) technologies and general network architectures of limited nodes. The numerous and highly heterogeneous solutions on offer today provide different features and performance, making it difficult to identify the most appropriate IoT communication technologies and solutions for a particular smart environment (Gomez C. et al., 2019).

According to Brandt T. et al., the tourism sector, one of the biggest sectors globally. And many researchers try to explain the definitions of Smart Tourism, e-tourism, Smart Cities etc. In a current research of Kontogianni A. et al., led to a conclusion that e-tourism is focused on digital connections, the interaction between consumers and businesses. Although Smart Tourism connect the physical world with the digital, by taking advantage of social media, cloud computing and IoT (Kontogianni A. et al., 2020).

3. Cultural Tourism — Smart Tourism

From Roman times, there may have been tourists for cultural reasons. At that time of course, they were not a separate part of travelers. In essence, almost all types of visits/trips are of cultural interest (Mckercher et al., 2012) But what is defined as cultural tourism? It seems like an easy question that in fact has quite a difficult answer as the definitions will be as numerous as the tourists of culture (Mckercher et al., 2012).

Cultural tourism, according to ICOMOS (2015), is one of the various forms of tourism that has as its object the discovery of monuments and sites, but at the same time contributes in practice to their preservation and protection. This form of tourism gives economic benefits to all interested populations.

In general, the smart enhancement of cultural heritage is associated with four dimensions (Graziano T., 2014):

• collection, reproduction, protection, management/conservation (i.e., restoration measures or archiving techniques).

• Content and multimedia creation technologies, both conservative and productive (i.e., databases, data mining, semantic web, imagination, augmented/virtual reality).

• Interactive user experience technologies (i.e., emblematic/virtual/augmented reality. Environmental awareness and geolocation smart environment. Applications for smart terminals).

• the dimension of cultural heritage as a specific element that is connected within a complex system that

gives new possibilities for urban governance. It is considered a complex system to be monitored through the collection of live data and governed by the allocation of resources according to users/citizens/visitor requests through, for example, sensor networks that record key activities or city event management platform solutions. (i.e., sensors for recording the flows of citizens communicating with nearby beam systems such as Bluetooth, WiFi, cloud computing platforms that can collect huge amounts of data and process them).

Mobile technologies are the main tools through which users/consumers can integrate their personal experience, changing the relationship with cultural products into a dynamic interaction. These tools can allow tourists to represent, describe, interact with cultural objects or tourism in a space-time dimension through an approach involving the simultaneous use of different mobile devices (Graziano T., 2014).

Smart tourism, which could include relevant development opportunities, is not really supported by institutional actors, as highlighted in the Smart Culture and Travel Report 2014. The report analyzes a wide range of seventy (70) indicators, related to accessibility in online information, hotel and restaurant reservations, purchase OnLine tickets for tourist attractions, museums and theaters, the ability to plan and personalize a trip. and, finally, the presence of social networking pages and applications for tablets and smartphones dedicated to culture and tourism.

In his book Clay Shirky (2010) "Cognitive Surplus: Creativity and Generosity in a Connected Age" he observes that the Internet changes the way we spend our free time (Schäfer, 2011). The so-called "cognitive surplus" spent on passive activities (mainly TV watching) can now be used in a completely different way, for new kinds of creativity and problem solving. He writes that "the wiring of humanity allows us to treat leisure time as a common global resource and allows us to design new types of participation and exchange that can benefit from this resource".

Shirky finds Wikipedia a fascinating example. After calculating that the creation of Wikipedia as it stands today has taken one hundred million hours of accumulated thought, he contrasts this with the astonishing 200 billion hours of television viewing in the United States alone. 200 billion hours would amount to two thousand Wikipedia works worth of free time, every year.

In the field of cultural heritage, Galleries, Libraries, Archives and Museums around the world are beginning to explore the possibilities of crowdsourcing. The mass digitization of analog farms is the key to recording and preserving existing cultural heritage and will be an integral part of the World Wide Web. In the case of fragile objects, digitization is a means of ensuring their long-term preservation.

4. Data Collection and Processing

Initially, a questionnaire was distributed online with the question "How many trips motivated by culture have you taken in the last two years". This questionnaire was answered by 167 individuals. We then approached the individuals with the largest number of cultural visits and returned with a new questionnaire. We selected only individuals with at least three trips. As a result 42 individuals took place in our research.

The following questionnaire was distributed via google forms:

| Suppose you plan to visit a city with a wealth of cultural sites and events for tourism. Rate the effect of the following characteristics that a city may have on your decision to visit it in the end (0: the attribute does not affect my decision, 1: the attribute greatly influences my decision, 2 the attribute significantly influences my decision)	
Interoperability of devices and cultural infrastructure	
Smart points for automated guides (personalized information provision).	
Methodologies for integrating knowledge in mobile applications	
Virtual reality services in museums.	
Use of smart devices for outdoor cultural experiences	
Location and orientation subsystem on the cultural map	
Personal data protection	

In the following table the results of questionnaire are presented.

	Number of individuals who rate with 1	Number of individuals who rate with 2	Number of individuals who rate with 3
Interoperability of devices and cultural infrastructure	4	6	32
Smart points for automated guides (personalized information provision).	24	10	8
Mobile applications for integrating knowledge.	3	6	33
Virtual reality services in museums.	14	14	14
Use of smart devices for outdoor cultural experiences	7	7	30
Location and orientation subsystem on the cultural map	7	20	25
Personal data protection	15	11	16

The following pie style chart have been created from the above table.
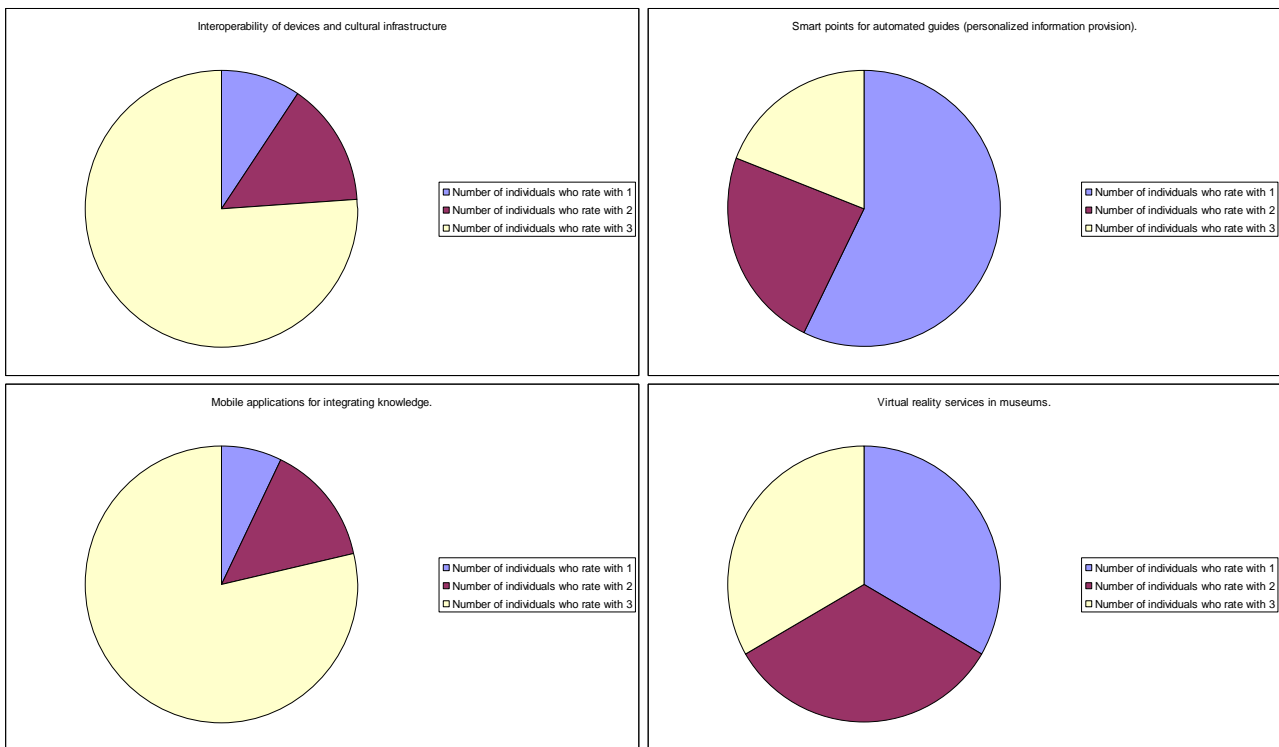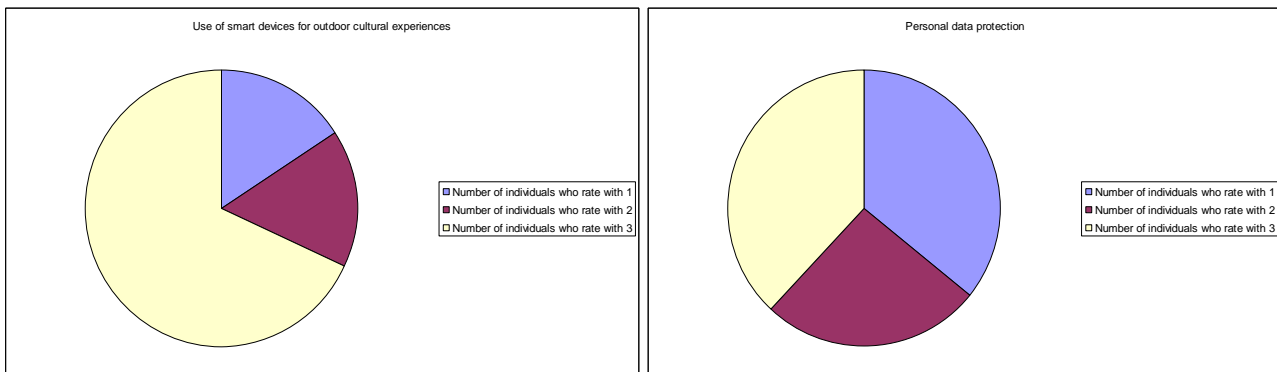
We can observe that the features directly related to mobile devices are particularly attractive. Specifically, interoperability of devices and cultural infrastructure, mobile applications for integrating knowledge and use of smart devices for outdoor cultural experiences attract the vast majority of respondents. In relation to the other features, no clear conclusion is drawn, although a significant percentage of respondents show remarkable interest.

4. Conclusion

As no special care has been taken to ensure that the sample is representative further research is required in order to draw more reliable and more general conclusions.

Smart environments, and ubiquitous information systems have a lot to offer in a wide range of applications related to cultural heritage, from the production of knowledge and through research, management and data retention, and their presentation to the public.

What we have presented above confirms our initial impression that the majority of efforts to date have focused on both ends of this "pipeline". The application of smart technologies to the full range of cultural tourism activities such as: networking, communications, tracking, devices and interoperability, and personal privacy, continue to be a challenge for the research community.

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