

Smart Destination and Technology Driven Tourism for Sustainable Development

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Abstract

The 21st century is technology driven and digital innovation forms the bed rock of technological development. The continuous development and innovation in information & technology has brought in the concept of intelligent organization. The application of the modern technology to the traditional discipline of tourism has led to the emergence of smart tourism. At the turn of the century in order to meet the goal of sustainable development the concept of smart cities has caught the imagination of the global community in the developed as well as the developing countries alike. Thus, was soon the seed of smart tourism destination which has its underpinning's in technology driven tourism. It is necessary to improve the tourist's experience and satisfaction, and applying innovative ideas to direct traveler's requirements before and after their tour which would raise the competitiveness in the tourism sector. The main idea is the use of information and communication technologies to develop the strength of a destination to fulfill its own objectives by providing quick acknowledgement to the needs of tourists, tourism firms and the government. Ahmedabad is the first Indian city to be conferred with the title of UNSECO Heritage city in 2017 and is one among in 100 cities to be developed as Smart city in India. Hence, this paper has taken up case of Ahmedabad to explain the concept of smart destinations.

Keywords: Smart Destination Tourism, Information Technology, Sustainable Development, Intelligent Organization, Ahmedabad

Introduction

According to the UNWTO report International tourism propelled ahead in 2014 as the number of international tourists (overnight visitors) grew 4.4% with an additional 48 million more than in 2013 to reach a new record total of 1,135 million. This caps five consecutive years of above average growth since the global economic crisis of 2009. With a 4.4% increase, international tourism once again

exceeded UNWTO'S long term forecast of 3.8% annual growth for the period 2010-2020 reflecting the sector's strong and consistent performance in spite of the global challenges the world faced in 2014. As per the FICCI, Indian tourism and hospitality industry has emerged as the largest service sector in India. Although the country is the seventh-largest in the world in terms of its geographical area, it is unparalleled in its beauty, uniqueness, culture and history, which make it a top tourist destination.

India sees the 11th largest tourist inflow in the Asia-Pacific region and 42nd worldwide, according to India Tourism Statistics 2013. Its tourism industry is flourishing due to an increase in foreign tourist arrivals and a larger number of Indians travelling to domestic destinations. Tourist inflow into the country grew at 7% annually from 2010 to 2014. In 2013, India had 6.97 million registered foreign tourist arrivals - 0.64% of the total foreign tourist traffic in the world (www.ficci.com).

In 2014, the tourism sector contributed INR 7.64 trillion to the GDP and provided employment to 36.7 million people. By the end of 2015, these numbers are expected to increase to INR 8.22 trillion and 37.4 million respectively. This would mean that tourism will account for 7% of India's GDP in 2015. In 2014, travel and tourism investments in India accounted for INR 2.11 trillion or 6.2% of the total investments – which is expected to rise by 9.3% in 2015 (UNWTO, 2014).

“Smart” has become a new buzzword to describe technological, economic and social developments fueled by technologies that rely on sensors, big data, open data, new ways of connectivity and exchange of information. In the context of tourism, smart is used to describe a complex amalgam of all of the above. There is incredible

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institutional support and in some instances even pressure to realize smart tourism (Ulrike Gretzel et al., 2015).

Two major paradigm shifts have been challenging the current understanding of the tourism experience. First, the traditional experience economy has been increasingly replaced by the notion of experience co-creation, which recognizes active consumers co-creating their experiences in a quest for personal growth and value (Prahalad & Ramaswamy, 2004a). Second, more recently, there has been evidence that tourism experiences are not only co-created but increasingly technology-mediated (Tussyadiah & Fesenmaier, 2009), which enables tourists to create richer experiences (Gretzel & Jamal, 2009) and empowers them to co-create their own experiences (Prahalad & Ramaswamy, 2004a). With the dynamics of empowered consumers and proliferating technologies, traditional roles, structures and processes of destinations creating experiences have changed (Barbara Neuhofer et al., 2012). In the last few decades the development of Information and Communication Technologies (ICT) introduced new technologies such as the Internet, Social Media, NFC, Augmented Reality, Ubiquitous Computing, and Machine to Machine (Gartner, 2014).

Background of Research

The use of aforesaid technologies in day to day is a reality, which in the coming years is going to be more present and latent in all areas. One of the areas with largest impact is the tourism industry. Technological changes which happened in the last decade are transforming the traditional operations of the tourism industry very quickly, and a failure in the adaptation to these changes can have a negative effect on the destinations. Given the importance of these changes, this paper focuses on the important role that technology can play in a destination as a distinguishing element, and which would enable the destination to have a competitive advantage and an improvement in tourists' experience. The diverse stakeholders of a smart destination apply new information and communication technologies, working under cooperation and collaboration, for the development of intelligent destination strategies. These strategies have to be dovetailed to the tourism strategy. Furthermore, it has to be taken into account that a smart destination considers a large number of interconnected projects, which belong to the different destination sectors and therefore demand an effective communication. The new technologies work

as a tool for taking more efficient and effective decisions in order to reach fixed objectives and should be applied in an intensive but systematic way. The intensive application of information and communication technologies is a future reality in tourism (Hernandez Martin et al., 2014).

A successful destination is a tourism area which continuously attracts the desired tourists through quality and unique experiences and which continuously develops, ensuring benefits for all the stakeholders, for the entire local community, and for the place itself (resource preservation). The process of continuous development should follow the sustainable way in order to provide long-term success. This approach has been recently highlighted by the World Economic Forum, which, since 2007, has been releasing the Tourism and Travel Competitiveness Index, one of the most detailed and comprehensive studies regarding the tourism performances of world countries as macro-tourist destinations. In the 2015 report, the experts from the World Economic Forum stated that the aim of the Competitiveness Index is "to provide a comprehensive strategic tool for measuring the set of factors and policies that enable the sustainable development of the Travel & Tourism sector, which in turn, contributes to the development and competitiveness of a country". In order to emphasize the relationship between sustainability and competitiveness, it was recently declared that a destination which does not develop in a sustainable way cannot be a competitive destination.

Review of Literature

Smart Destination Tourism

Bringing smartness into tourism destinations meaning that destinations need to interconnect multiple stakeholders through a dynamic platform mediate by ICT in order to support prompt information exchange regarding tourism activities through machine-to-machine learning algorithm which could enhance their decision making process (Buhalis & Amaranggana, 2014).

Smart Tourism Destinations also harnessing the true essence of technology by building framework to facilitate multiple visualizations in a common direction. Smart destinations seem to be a great opportunity for tourism destination management above all when it comes to sector-crossing cooperation and long term persistence.

Nevertheless it is necessary to highlight its multi-dimensional attribute, by embracing the diversity of sectors which compose a destination and its particular characteristics. This diversity implies a high grade of complexity when it comes to managing the system, and coordinating among the large number of stakeholders (Eduardo Parra López et al., 2014).

The concept of “Smart Destination” in this context has been envisaged as modern integrated management of destinations, using technology to optimize resources and develop new strategies based on more ‘bottom-up’ approaches. Such an approach allows destination managers to coordinate and collaborate with users in order to design an experience without a smooth transaction, allowing at the same time the users to share information and knowledge, creating additional opportunities to explore and build new consumption experiences (Racherla et al., 2008). So a “Smart Destination” permits a much greater attention to what destinations (and, consequently, the stakeholders) need and want.

The collaboration and cooperation of private and public organizations is a required characteristic of a smart destination, yet this conjunction permits the production of numerous data and information from different kinds of media and a governance of the destination that knows how to encourage and also regulate the multiple relations. It even can be said that the success of a smart destination depends more on the management capacity, i.e. the governance, in conjunction with highly qualified human resources than on the technological capacity, whether talking in terms of quantity or advancement. On the one hand a smart governance enables the development of a smart destination and on the other hand a smart destination also contributes to an improved governance, as it provides tools which facilitate coordination and interchange (Gahr et al., 2014).

This new paradigm embraces a set of useful tools for territories to be more efficient, more sustainable and more livable for citizens, as well as more attractive for tourists. It follows that a Smart Tourism Destination can be defined as a local system characterized by advanced services, a high degree of innovation through a considerable use of advanced technologies (ICTs) and the presence of open, multipolar, integrated and shared processes directed

at enhancing the quality of life for both residents and tourists (Florida, 2003; Komninos, 2002, Shapiro, 2006; Hollands, 2008; Caragliu et al., 2009).

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A Smart Destination is a destination where companies, administrations and tourists constantly interact to perform three activities continuously and iteratively:

- Collection of data about the activities that take place at the destination, collected from all possible sources of data (some of which are already available and others that will be implemented specifically for this aim).
- Analysis of the wide variety of data collected using various intelligent algorithms to detect patterns of tourist behavior and of operations at the destination, in order to allow proposal of measures to improve both the management of the destination and tourist satisfaction.
- Implementation of measures that pass an analysis of economic, technical and financial feasibility to improve the destination, making it more sustainable and adaptable to the needs and tastes of tourists who can even customize their experiences—as a result, tourists obtain a more satisfying stay while improving the efficiency and effectiveness of the destination (www.jbulchand.com)

An innovative tourist destination, built on an infrastructure based on state-of-the-art technology guaranteeing the sustainable development of the tourist area, accessible to everyone, which facilitates the visitors’ interaction with and integration into their surroundings, increasing the quality of the experience at the destination,

while also improving the quality of life of its residents. The result of the reconversion is to stimulate increased competition through innovation, leading to an improved perception of the destination and a greater productive capacity for companies, quantitatively generating an improvement in the residents' quality of life.

Destinations seeking to become STDs must implement a revalorization strategy aimed at increasing competitiveness through an enhanced exploitation of their natural and cultural attractions, the creation of additional innovative resources, and improvements in the efficiency of their production and distribution processes. The ultimate goal is to stimulate sustainable development and facilitate visitors' interaction with the destination (www.segittur.es)

Information Technology

As one of the fastest growing industries in the world, travel and tourism has always been in the forefront of technology adoption (Sheldon, 1997) and has taken advantage of the synergies between technology and tourism (Buhalis & Law, 2008). The role of ICTs in the tourism industry is multifarious. For instance, technology has been ascribed a key role in the operation, structure and strategies of tourism organisations (Buhalis, 2003; Buhalis & Law, 2008), a central element in the innovation of products, processes and management (Hjalager, 2010), and an enabler of opportunities for tourism organizations to attract and retain visitors (Werthner & Klein, 1999).

The technological background of Smart Destinations basically consists of the Internet of Things (IoT), the use of smartphones and Near Field Communication, among some other advances which afford and create the so called Big Data. The IoT (Luigi Atzori, Iera & Morabito, 2010) refers to a variety of non-living objects, whose interaction is able, thanks to wireless communication systems. The recollection of data, their transmission, storage and their analysis, i.e. the use of Big Data is what makes the difference.

According to several experts, there are five technologies helping to transform the tourism sector: cloud computing, which improves flexibility and scalability of organizations, reducing the costs associated with technology, big data, providing large information volumes that can become in

specific knowledge of customers and their preferences; digital platforms that facilitate ongoing interaction with customers in order to adjust supply to their specific demands; apps, which are a new model of services and content consumption, and finally, natural interfaces that are transforming the travel experience through devices that are used through gestures, body movements or voice (Elisa Alen Gonzalez, 2015 et al.).

Sustainable Development

The most commonly used definition of sustainable development is still that given in the report of the World Commission on Environment and Development (1987), i.e. sustainable development is 'a process to meet the needs of the present without compromising the ability of future generations to meet their own needs.'

Tourism and Sustainable Development: A Special Relationship

Tourism occupies a special position w.r.t the contributions it can make to sustainable development and also the challenges it presents. Firstly, this is because of the dynamism and growth of the sector, and the major contribution that it makes to the economies of many countries and local destinations. Secondly, it is because tourism is an activity which involves a special relationship between consumers (visitors), the industry, the environment and local communities. This special relationship arises because, unlike most other sectors, the consumer of tourism (the tourist) travels to the producer and the product. This leads to three important and unique aspects of the relationship between tourism and sustainable development:

- *Interaction:* The nature of tourism, as a service industry that is based on delivering an experience of new places, means that it involves a considerable amount of interaction, both direct and indirect, between visitors, host communities and their local environments.
- *Awareness:* Tourism makes people (visitors and hosts) become far more conscious of environmental issues and differences between nations and cultures. This can affect attitudes and concerns for sustainability issues not only while travelling but throughout people lives.

- *Dependency*: Much of tourism is based on visitors seeking to experience intact and clean environments, attractive natural areas, authentic historic and cultural traditions, and welcoming hosts with whom they have a good relationship. The industry depends on these attributes being in place. This close and direct relationship creates a sensitive situation, whereby tourism can be both very damaging but also very positive for sustainable development (www.unep.fr).

Sustainable tourism development guidelines and management practices are applicable to all forms of tourism in all types of destinations, including mass tourism and the various niche tourism segments. Sustainability principles refer to the environmental, economic, and socio-cultural aspects of tourism development, and a suitable balance must be established between these three dimensions to guarantee its long-term sustainability.

Thus, sustainable tourism should:

- Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity.
- Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.
- Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

Sustainable tourism development requires the informed participation of all relevant stakeholders, as well as strong political leadership to ensure wide participation and consensus building. Achieving sustainable tourism is a continuous process and it requires constant monitoring of impacts, introducing the necessary preventive and/or corrective measures whenever necessary.

Sustainable tourism should also maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising their awareness about sustainability issues and promoting sustainable tourism practices amongst them (UNWTO, 2005).

Intelligent Organization

“Intelligent” refers to the inclusion of complex analytics, modelling, optimization, and visualization services to make better operational decisions (Harrison et al., 2010).

Intelligence means the ability to comprehend, to profit from experience, to acquire and retain knowledge and to respond quickly and successfully to a new situation (Rudas & Fodor, 2008). There are two components of intelligence that are usually emphasized when distinguishing intelligent systems from those which are not: 1) the ability to sense the environment; and, 2) the ability to learn from actions to maximize success in achieving particular objectives. Thus, intelligent systems are in communication with their environment and continuously evaluate the responses they receive from this environment with respect to their actions to determine the favorability of these actions (Fritz, 2006). As Krishna kumar (2003) defines intelligent systems as systems that can be characterized by flexibility, adaptability, memory, learning, temporal dynamics, reasoning, and the ability to manage uncertain and imprecise information.

The intelligence of these systems is usually judged against human intelligence. According to the Turing Test (Oppy & Dowe, 2011), achieving system intelligence would mean that the interaction with a system was indistinguishable from an interaction with human beings.

Tourism is a main application domain for intelligent systems because of the general complexity of decisions to be made in tourism contexts. This complexity stems, among other factors, from the mobility of tourists (Hall, 2005) and the increased risk and uncertainty experienced in unfamiliar environments, information contained in distributed sources, the idiosyncratic quality of tourism decision-making, the multi-faceted nature of tourism experiences, and the interdependency of sub-decisions (Jeng & Fesenmaier, 2002). Thus, intelligent systems can provide great value if they help in collecting and pre-processing information according to personal and situational needs of the user.

Research Methodology

The paper combines theoretical background of smart destination in order to explore and identify in depth,

issues such as destination tourists experience in a sustainable manner and application of ICT. The research is exploratory and based on the usage of secondary data which includes various journals (both print & online), Periodicals, Reports, Books & useful internet sites. This paper has also taken up case study of Ahmedabad to explain the concept of smart destinations.

Limitation

Although this research paper throws light on Smart Destinations, it also has a few limitations viz. secondary data was used and study is exploratory in nature. Use of case study approach or interviews with the stakeholders could help in better understanding of the subject and would have generated more information but was not conducted because of practical constraints in the field setting. Further research is desirable in order to increase more contributions in this area and to validate the findings of the study with secondary data. Hence, this study can act as a base for future research.

Case Study of Ahmedabad

Ahmedabad is the largest city in the state of Gujarat and the first Indian city to be conferred with the title of UNESCO World Heritage city in 2017. With this title, Ahmedabad hopes to become a major tourist destination in the western part of India. Ahmedabad is on their way to become smart cities in the future and by doing so they can increase tourism and their standard of living in the coming future (Solanki et al., 2019).

Ahmedabad is a historic city which has existed for more than 500 years. Majority of the cities around the world are civilizations which have existed for hundreds of years. Due to this reason, there is an absence of a master plan or a development plan of the city. A lack of master plan hampers the development and the growth due to the absence of a well-defined architecture of the city. This is one of the biggest challenges in cities which have existed as civilizations for thousands of years (www.iifl.com). The walled city of Ahmedabad has existed for 600 years characterized by narrow lanes and old buildings which have existed for hundreds of years. Government has to ensure that heritage sites do not get hampered or destroyed in the pursuit of innovation. Integration of old

structures with new technologies remains a big challenge in cities (Bansal et al., 2017).

The city of Ahmedabad was selected as one of the first 20 smart cities to be selected by the government of India in 2016 under the SMARTNET project launched by the Government. The initiative is to promote the development of smart cities using central financial aid. Under this initiative, the government is planning to develop smart cities whose results would show by the year 2022. Under this project, the city of Ahmedabad aims to use sustainable energy and smart traffic system to counter the increased congestion and traffic on the roads (ahmedabadcity.gov.in).

Ahmedabad has a special corridor for bus transportation called BRTS (Bus Rapid Transit System) and a proposed metro plan is underway. The government wishes to introduce a common card for all payments, be in BRTS, metro or parking services. An app would also be present on our smart devices where we can check the balance and the trips. Along with this, there would be real-time parking facility in the app which would show us the nearest parking spots around us. Planned parking space would mean more space on the roads and less traffic (smartnet.niua.org).

The city of Ahmedabad suffers from a traffic problem. This problem is particularly menacing in the old parts of Ahmedabad, where the roads are small and the traffic movement is high. In this kind of situation, a simple sensor on the garbage dumpsters can help decrease the traffic. The sensor would show when the garbage dumpster is full and the garbage collecting trucks would schedule their trips accordingly. This helps in traffic management along with reduced pollution. The Wi-Fi network from the buses can collect data from across the city (Solanki et al., 2019).

The municipality of Ahmedabad has also launched an Intelligent Transit Management System to enable real-time data gathering which would provide feedback to commuters and traffic managers. It would show real-time traffic in locations to help commuters find out the exact time in which a bus would arrive at the station. Along with this Automatic Fare collection has also been targeted on Bus stations to ease operations (smartnet.niua.org).

To promote clean and green energy solar panels and windmills have been installed at various office spaces and open fields respectively. Specialized stations to

rent cycles have been provided throughout the city to encourage a healthy lifestyle along with reduced pollution levels (smartnet.niua.org). Dedicated cycling tracks like in European countries remains a challenge due to small roads and heavy traffic. The government has also launched a website of Ahmedabad to interact with citizens and drop alerts about the latest plans and schemes of the government (smartnet.niua.org).

Result & Discussion

Tourism research has important contributions to make to the development of intelligent systems, which will likely increasingly permeate consumption and work processes related to tourism. Intelligent systems require reasonable models of the domain within which they have to realize goals through their actions. The tourism domain is complex and the current literature has focused on simplification instead of exploring its richness. Simple models are helpful to some extent but with increasing computational power and more sophisticated algorithms that can handle complexity and uncertainty it becomes possible to represent the world in more sophisticated ways. There is also a need to critically reflect on the impacts these intelligent systems have on the socio-technical systems within which they exist (www.researchgate.net).

One of the most far-reaching changes in the society in the 21st century is the proliferation of information and communication technologies (ICT). The advancements in the technology from the past few years have a great impact on society and people's lives and it also determined in the various sectors, including the tourism industry. With the dynamics of ICTs changing creation and consumption of the tourism experience, destinations are thus facing a major paradigm shift (Buhalis & Law, 2008). Therefore, Huang and Hsu (2010) argue that it is crucial to capture these changes, whereby it is not the technological development on functional terms per se but rather the integration of technology into the experiences which is of interest (Darmer & Sundbo, 2008). With technology in use, tourists have transformed from passive recipients to connected prosumers co-creating their experiences in a technology enabled destination environment (Prahallad & Ramaswamy, 2004a; Gretzel, Fesenmaier & O'Leary, 2006; Andersson, 2007).

Conclusion

Applying the concepts of Smart Tourism within destinations is deemed necessary to potentially enhance tourism experience through advance feedback loops, enhanced access to real-time information and advance customer service through Internet of Things to address factors that potentially shape negative experience.

Smart Tourism Destinations are essential for offering personalized services to their clients by considering several aspects namely access to real-time information for collection of users' data, instant feedback loop to help reveal users' opinion upon offered services, a dynamic platform enabling different stake-holders to exchange data for promoting service integration; and ability to precisely predict what visitor wants through historical data (pattern analysis) to formulate distinctive services. Information and communication technology is one set of tool which guarantees the stakeholders the access, gathering and transfer of information on destination. Although such an intelligent system can impart a lot of efficiency to the tourism sector, but high or exorbitant cost of technology can be a bottleneck in the successful implementation of smart tourism. As Smart Tourism Destinations have the potential to create an enabling environment by empowering the differently abled through a procedure that automatically adapts the devices to the personal needs of the user, it is necessary to seek their opinion and expectation on such development. Therefore, Success of Smart Destination Tourism depends to a great extent on the digital infrastructure available, i.e. e-tourism platform. It adds to it an all pervasive mobile connectivity and bridges the digital infrastructure with the physical infrastructure to create a new information structure that spans across an entire destination. It takes co-creation and personalization of tourism experiences to a new level and actively tries to achieve efficiency and sustainability. Thus Smart tourism is committed to generating a low impact on the surrounding environment and community by acting responsibly while generating income and employment for the local economy and aiding social cohesion. It would bring in upward economic and social mobility for a large number of people relegated to the bottom of the socio-economic pyramid, thereby leading to Sustainable Development.

Governments of India has identified and announced 100 smart cities all over the country which would be developed in set course of the time. Ahmedabad being India's first world heritage city in India has the potential to exploit tourism. Being a smart city does not only mean being responsible to the citizens living in the city but it also means being responsible to the people visiting it. A smart city increases tourism as tourists love to travel to a city which is safe and easy to travel without any hassle. If this dream project sees the light of the day then will give major boost to entire hospitality & tourism industry. Modern & massive infrastructure to be created under this project will eradicate the problem of poor tourism infrastructure in the country. Moreover, it also offers opportunity to academicians & researcher to carry out research on its various aspects of Smart Cities. Hence, present study is just a beginning and step forward in this emerging area.

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