IOT TO PROMOTE SMART TOURISM

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Abstract:
Since the commencement of web technology in the nineties, Tourism has been a major domain of application of the World Wide Web. It is also one of the most benefitted areas of Internet and its related progressive technologies. With the initiation of ideas like Internet of Things (IoT), Smart cities, Cloud computing, Big Data etc., there has been an increase in the avenues of their implementation. Smart cities can accomplish their targets well only when all its areas work smartly. Smart tourism is the necessity for such smart cities which possess heritage value or other tourist attractions. It has to bring together the various stakeholders in the tourism industry through a common platform of technology and hence provide a mechanism for their cooperative functioning through information exchange and analysis. This paper aims to provide an insight into this concept and how it can be realized through the modern technology of IoT. It reviews the perspective of the service providers as well as the tourists and how their experiences can be enhanced through Smart tourism.

The rapid increase of urban population worldwide has triggered intricate challenges for cities around the world. City infrastructures are facing a massive pressure due to the fact that more than half of the world's population lives in the cities. As cities become increasingly competitive and complex, Information and Communications Technology (ICT) will coordinate all activities and services, leading to connect, better informed and engaged citizens. Internet of Things (IoT) is a field where any device or object can be made smart and identifiable through radio frequency tags. These devices can communicate with many other smart devices through the network. The communication generates a large amount of data that can be stored and computed on the available Cloud services. Tools of Big Data analysis can be very useful in analyzing the trends and patterns in the data. With the initiation of Internet of Things (IoT) and Smart cities, a lot of focus has been laid on various sectors like tourism, healthcare etc. and they have already reaped the benefits of improving technology. The use of technology has helped both the tourism industry as well as the tourists. These days, it has become easier to book a holiday tour online. Likewise, it is very convenient for the hotels and airlines to operate their business online as it has a wider approach. Internet has radically changed the conventional business models and people are widely adapting to it[1].

Smart Tourism Idea:
Smart Tourism will result as an amalgamation of the existing online business model with the modern Information and Communication Technology (ICT). It is an extension of the already existing online business model which functions through the websites and online bookings. It will provide services to its users along with up-to-date information during and before their tour. The various technologies which interplay to provide Smart Tourism services will be the web, mobile, cloud computing, Internet of Things (IoT) and Big Data analysis. Simple devices like our mobile phones are equipped with camera, microphone and sensors to detect movements. The information collected by such smart phones can be processed on servers and hence used for smart living. Smart living requires smart houses and smart work conditions. That means all the services used for living like healthcare, education, tourism etc should turn smart as well[2].

Internet of Things:
The Internet of Things (IoT) is rapidly gaining ground in the emerging world of ICT. The term IoT was coined by Kevin Ashton in 1999. He defined IoT as a network that connect anything at anytime and anyplace in order to identify, locate, manage and monitor smart objects. The idea behind the IoT is to generate automatic real-time interactions among real world object that connect to the Internet which consequently reduce the gap between real world and digital realm. In a tourism context, tourists could simply use their mobile phones to explore the destination and events of interest using in-situ data collection and reporting. These activities leave massive size of digital traces resulting in multidimensional set of data which is known as Big Data. By managing Big Data, tourism organizations could extract valuable insight from avalanche of information that could elevate them to a new dimension of customer experience and improves the way they interact with the customer. Those who master this form of technology gain an abundant competitive advantage to competitors[3]. There are several viewpoints in defining tourism destinations. In regard with its geographical area, tourism destination is defined as an area that is selected by visitors which encompasses all necessary amenities such as accommodation, restaurant and entertainment. Meanwhile, definition of tourism destinations could also stress beyond their geographical limit to the extent that depends on tourists' origin motivation the linkage between one tourism products and another at destination level is vital because of the nature of tourism industry which are a combination of multiple components that served in several touch points that perceived by the customers prior, during and after their trip.

Successful destinations can be structured as the 6As of tourism destinations:
- ✓ Attractions which can be natural such as mountain; artificial such as amusement parks; or cultural such as music festival.
- ✓ Accessibility refers to the entire transportation system within destination that comprise of available routes, existing terminals and adequate public transportations.
- ✓ Amenities characterise all services facilitating a convenient stay, namely accommodation, gastronomy and leisure activities.

- ✓ Available Packages refer to the availability of service bundles by intermediaries to direct tourists' attention to certain unique features of a respective destination;
- ✓ Activities refer to all available activities at the destination which mainly trigger tourists to visit the destination; Ancillary Services are those daily use services which are not primary aim for tourist such as bank, postal service and hospital. It is deemed important for destinations to properly maintain each of their 6As to be highly competitive in the industry. However, with consumers taking over the process of co-creation, destinations need to realise that conventional approach has become obsolete and they need to interconnect all their stakeholders to facilitate a dynamic co-creation process to increase destination competitiveness[4]

Smart Tourism Destinations take advantage of:
- ✓ Technology embedded environments
- ✓ Responsive processes at micro and macro levels
- ✓ End-user devices in multiple touch-points; and
- ✓ Engaged stakeholders that use the platform dynamically as a neural system.

The ultimate aim is to utilise the system to enhance tourism experience and improve the effectiveness of resource management towards maximising both destination competitiveness and consumer satisfaction while it also demonstrate sustainability over an extended timeframe. There are three forms of ICT which are vital for setting up Smart Tourism Destinations, namely Cloud Computing, Internet of Things (IoT) and End-User Internet Service System. The Cloud Computing services are designed to provide convenient way to access solid web platform and data storage through certain network. The use of Cloud Computing is to reduce fixed costs and shift them into variable costs based on the necessities. It also stimulates information sharing that is fundamental to undertake any Smart Tourism Destinations project.

Outcome of the Stakeholders:
Tourism Organizations :
- ✓ function as smart hub that coordinates all relevant information and makes it easily accessible for users to access real-time information
- ✓ work for the digitisation of core business processes
- ✓ optimise their energy use
- ✓ engage with local communities, tourists and government in co-creating tourism experience
- ✓ aim at organisational agility, speed decision making and responsive to customers' needs based on just-in-time insights
- ✓ care for precision targeting and personalised service

Governments:
- ✓ Provide information governance that support data openness
- ✓ Regulate data privacy
- ✓ Establish Public–Private Partnership

Local Residents/Local Communities are:
- ✓ Constantly connected
- ✓ Sufficiently creative and empowered
- ✓ Technology savvy
- ✓ Citizen journalism
- ✓ Actively involved in developing smart heritage/e-Culture
- ✓ Well-connected and well-informed
- ✓ Active critics and buzz marketers
- ✓ Known for Demanding highly personalised service
- ✓ Engaged both socially and technologically
- ✓ Dynamic in discussion through social media
- ✓ Co-creators of experience
- ✓ Contributors
- ✓ Utilises of end-user devices in multiple touch-points

Environment:
- ✓ is interconnected through Internet of things
- ✓ stresses the presence of cloud computing services
- ✓ is an innovation ecosystem
- ✓ sensors networks throughout the environment
- ✓ combines digital information and social contexts which will augment geophysical reality
- ✓ aims at interoperable social platforms

Open Data; and (2) information come from the citizens and visitors as digital footprint from their social media activities. Users could use this information to identify problems as well as customised potential solutions to overcome those problems[5].

The Internet and Marketing Activities of Tourism:
Marketing is an integral part of conducting business in contemporary travel agencies, with the Internet becoming an essential part of media planning. The Internet provides readily available information to potential customers from around the world and it represents an important 'marketing and communication channel' that can effectively connect the subjects of offer and

demand in contemporary tourism. The increasing competitiveness in the global tourism market demands the tourist agency's exceptional efforts and investments in promotion, resources, knowledge and quality, in order to achieve satisfactory growth.

- ✓ Marketing activities of contemporary travel agencies, which greatly enhance business through the Internet, can be highlighted in the following areas:
- ✓ Promotion of tourism services – current assets: TV, radio, newspapers, catalogues, pamphlets, posters, the screen technique; it is improved with promotional text, drawings, photographs and sound, 3D space, 3D photographs and media interaction.
- ✓ Tourism service sales – unlimited database and unlimited capacity of digital media allows instant access to the tourist market free products to every potential tourist.
- ✓ Tourist service booking – instantaneous communication between all participants of the sales process; it allows 'booking on demand', i.e. avoids excessive sales (overbooking).

In order to perform these marketing activities, particularly in selling travel packages, use of the following technologies stands out:

- ✓ World Wide Web the system of linked pages
- ✓ Mail connection for sending and receiving e-mail
- ✓ Multimedia – 'a combination of different media: text, sound and images, all computer-controlled.' Databases

By using the Internet, multimedia and databases it can achieve the following: a rational and fast online communication, direct contact with the market and its business partners, integration and automation of business process, delivery and access of information[6].

Advantages of Internet Usage in Tourism:
In contemporary travel agencies and tour operators business, the Internet has shown to be a profitable medium of tourism promotion and sales.

- ✓ 'The Internet represents an interesting and useful distribution channel for collecting clients and it provides the ability to identify their desires.'
- ✓ Promotional visualization of tourism services and products through multimedia technology leaves greater impression on potential customer than standard brochures, catalogues and leaflets.
- ✓ Overbooking has become almost impossible because all communication problems that may cause it are removed.
- ✓ The Internet allows the improvement of travel agencies and tour operators by speeding up communication and providing all the necessary information.
- ✓ Product distribution and services of agencies do not depend on the quantity of printed catalogues anymore and information about them can reach millions of the Internet users.
- ✓ The Internet provides selling services of travel agencies on demand.
- ✓ CRS/GDS systems allow better and more efficient business with clients to contemporary travel agencies.

'Greater added values which agencies, by using the Internet, can provide to clients are high-quality information, quick offer of services related to travel, fast order, express delivery and human personality.

Disadvantages:
Use of the Internet in contemporary travel agencies business has certain drawbacks such as: web information is not always complete and reliable, payment security is still not on the satisfactory level, and the sale of certain products and services demand direct communication with the travel agent[7].

Impact of Internet on Tourism:
With the advent of the Internet, marketers have access to the technology to customize products and communicate directly with smaller target markets. The Internet is now firmly established as a marketing tool. It serves as an integral part of the marketing mix, serving as a digital distribution channel as well as an electronic storefront. Consumers in the Internet medium are more than just passive recipients in the marketing process. The Internet is an interactive medium as opposed to traditional marketing which usually allows only one-way communication from marketer to consumer.

Implications of Smart Tourism:
There are certain implications which need to be addressed in Smart tourism. The foremost matter is the privacy and security of customer's data. Further, as huge amounts of data is produced during the stay of the tourist, the digital traces left behind shall not be used for purposes other than providing better tourism experience. The biggest concern is however, the deep dependence of the system on technology and network services. It is impossible to implement such a system without the use of smart phones and high-end infrastructure. For a business to adopt this idea, the whole business model needs to be revolutionized. Trained and knowledgeable staff is required to work in the new model. The whole idea is to collaborate with other businesses like telecom and come up with a united picture of services[8].

Conclusion:
The idea of Smart cities and smart working in various sectors of such cities is bringing about a revolutionary change in the way the industry is working. The benefits of involving technology and Internet in conventional business models beyond the use of mere websites are manifold. Through Internet of Things (IoT) concept, a network of smart devices can be set up, which can enhance the working of any business and its service providers. Smart tourism in cities based on the idea of intelligence and smartness is a naïve idea which is being adopted by countries world-wide. The results are apparent in terms of the improvements in tourist experiences. However, there are certain implications like concerns over privacy of personal data generated by smart

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devices, due to overindulgence in technology. If measures are taken to answer all these concerns, the Smart tourism idea can bring huge benefits to its stakeholders as well as the tourists. Thus, IOT promises a range of new and a very innovative tourist services.

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