INTERNET OF THINGS: TECHNOLOGICAL ADVANCEMENT FOR TOURISM MARKETING

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Abstract

Radical innovation such as Internet of Things and self- regulated devices enhances the use of artificial intelligence and with the mixed realities i.e. virtual reality and augmented reality used to create an environment that are helpful in revamping the tourism industry and their practices. The aim of the paper is to explore technological innovation with the help of value- co-creation that will have the impact on ecosystem and will provide insight for dissemination of information to the consumers. The research incorporates predominant theories of co-creation, ecosystem management in services, and technological innovation/disruption in use of technological realities. The research aims at studying and structuring the conceptual framework for DMO (Destination Marketing Organization) for better tourist destination marketing and engaging more and more travelers/tourist. The paper study about the disruption and incremental innovation and use of ecosystem development and does not incorporate types of destination for different kinds of consumers. The paper will require future implications for the marketers and how they could adapt the different strategies for consumers.

Tourism and hospitality services prevail under varying levels of infrastructure, organization and cultural constraints. This paper provides an overview of potential disruptions and developments and does not delve into individual destination types and settings. This will require future work that conceptualizes and examines how stakeholders may adapt within specific contexts. With the advent of artificial intelligence and the use of smart technologies such as virtual reality augmented reality will enable the customers to navigate their surroundings and refine their searches with their and other customer's experiences. This will enable the marketers to influence the customers and can remain competitive in the world of competitors.

Keywords: Artificial Intelligence, Disruptive technologies, Augmented Reality, Virtual Reality, Co-Creation

INTRODUCTION

Information Communication Technology (ICT) is now being seen as the changing trend of tourism industry, with this changing technology of communication, tourism industry has witnessed a lot of developmental changes which the marketer can view as SWOT analysis (strength, weakness, opportunity and threat), in which ICT has also come up as one of the major threat to the industry by the advent of new technological changes and also the opportunity to grab this changing technological era for the new type of tourism industry development. With the help of IC, it empowers consumers to associate with the tourism related website and later can opt for different services offered on the websites. ICT technologies help the tourist to make these searches anywhere from the globe and design or craft their destinations with the increase use of ICT (Information Communication Technology) has increased the credibility, authenticity, congruency and has made convergence of different application at single point. It also helps in

building promoting the tourism market with different and technological strategies and operations. Smart Tourism Technologies and their omnipresent feature helps the tourism market to rediscover with the radical or disruptive innovation in the different processes and in the economy (Porter and Happelmann, 2014). This connotation will change the style of working for the websites and for the tourist to search for the destination in a compelling way. With this increasing revolution which gives the opportunity to the DMO (Destination Marketing Organization) to easily interact with their customer and can change dynamically according to their taste and preferences.

In terms of Tourism and DMO's are related to the service management and with the changing technologies and the new disruptive innovations that have took place. The opportunity and the convenience with the growing need for services is growing is increasing rapidly among tourist from all over the world can immediately search and also view the destination with the help of virtual reality and augmented reality, they can visit and see the type of destination they prefer to visit in the future. With the amalgamation of internet technology, big data networks and IOT (Internet of Things) which will revolutionize the production and the services of the tourism industry at both micro and macro level.

The work of DMO (Destination Marketing Organization) offer the services to the tourist in the belligerent environment in the fully secured and with the familiarities of their normal surroundings, where they are searching for a different culture, different types of languages and a new place and environment to visit to different places. In the words of Bahulis and Foersta, 2015, the customer need a technological advancement that after sitting in a remote location, they can check/view the destination sitting at their place with disruption innovation of virtual and augmented reality and in other words t could be said that the use of e- Tourism which incorporates the better integration of ICT technology with the use of GPS (Global Positioning System), reservation and booking system (Werthner. Et. Al, 2015), use of Social media and its different application for reaching more and more customers and also with the use of these application on mobile devices (Sigala, 2018), keyword driven social media searches, use of search engines ad web data analytics (Xiang et. Al, 2008). This revolution in the technology has benefited the customers to search the appropriate results for the enquiry and it will also help in to make the transaction easier.

The paper focuses on the evaluation of the technological disruptions in service industry which leads to the metamorphosis of value-creation process in the service industry. Emanated from considering the ICT technology it offers value co- creation, this paper also tries to find out how technological evolution enable value- co- creation among the DMO's of the tourism service sector and provide their services to have a proper ecosystem service provided to the end-users. The researchers try to encapsulate how different trends prevailing in the changing technological era can create a value- co- creation through the micro- level service providers.

TECHNOLOGICAL AMELIORATION IN TOURISM SERVICE SECTOR
New Trends or can say the changing trends in the technology has given more reliability to the management to offer more customer engagement and to create different strategies for fulfillment of customer needs and wants (Helkkula, Kowalkoloski and Tonwill, 2018) For more clear understanding a diagrammatic representation that shows how technology has impacted on the service industry. A trend of new and innovative technology that can be the augmented reality

or virtual reality with their radical changes in the service industry systems. The theory of value - co- creation helps the industry to provide a virtual view to analyze the impact (Edvardsson and Tranvoll, 2013) According to Helkulla et al 2018, the services offered and the integrated system of technological service innovation has given a new dimension to the service quality and its derivatives in the recent years. The customers need and wants are recognized as the foundation for co-creation and involves direct communication with the end users and even he also commented that these radical services help in delivering the right and valuable information to the customers.

Figure 1: Technological Amelioration in Tourism Service Sector
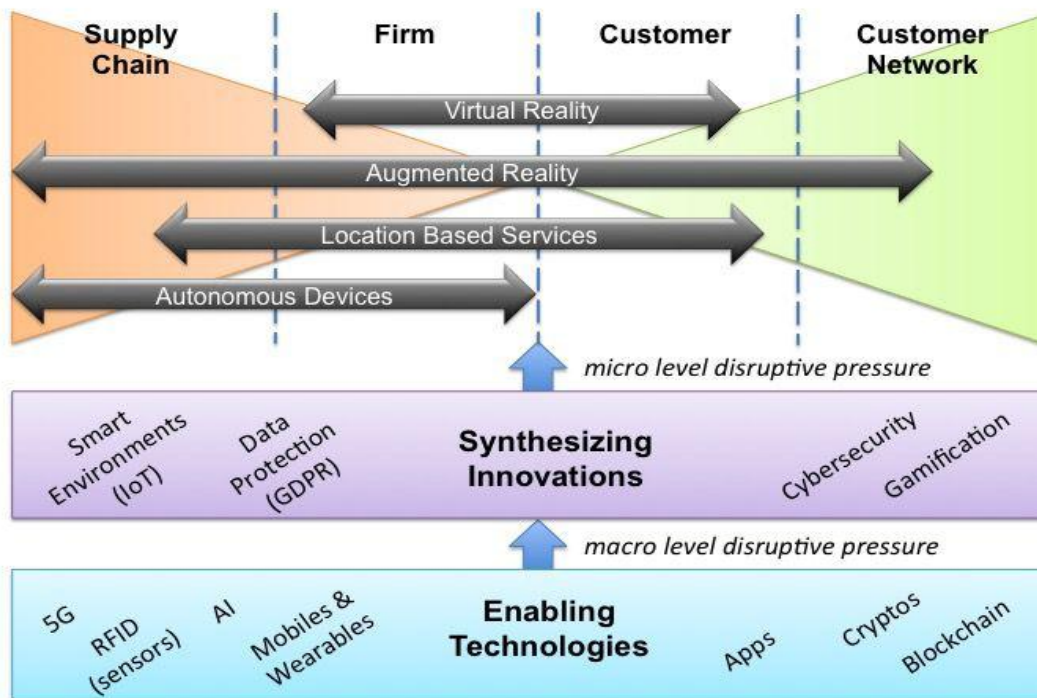
FACILITATING TECHNOLOGY

Innovation is the mother of invention and is very necessary for the improvement of economy and technological changes for being in the market and providing new improved services to the people. This will also help in the technologies for creating more and more interactions among the organization and the customer- These innovative technologies which will be discussed in this paper are as follows:

➤ 5G Mobile Network Technology
➤ Artificial Intelligence
➤ Radio Frequency Identification (RFID)
➤ Virtual Technology (Wearable's)
➤ Mobile Applications
➤ Block Chain and Crypto currency

THE 5G MOBILE NETWORK TECHNOLOGY

After the success of 4G, that is the fourth-generation mobile network, the new technology of 5th Generation Mobile Networks are knocking the door of the technological era. It is the enhanced version of mobile network where the files of large gigabytes can be transferred and uploaded

easily, as the live testimonial of the tourist, their live videos or recording about the different tourism services availed by them and will run on the tourist website without any hassle during live streaming. This also provides the better connectivity to the tourist sitting far away and with the help of the artificial intelligence and IOT (Internet of Things) (Palattella et al., 2016). With the help of 5G technology, which uses the urban area networks as IoT and autonomous devices (Gomez and Paradells, 2015)? The use of %g will diligently reduce the impact of bad security, stability and factors that are the bridge/agent between the organization and the customers with the development of ecosystem and value co-creation to deliver the better performance to the customers (G.W. Report 2015; Neokosmidis, et. al, 2017).

ARTIFICIAL INTELLIGENCE

The concept of AI (Artificial Intelligence was defined by Minsky in 1967. The system was made to perform the task that the human mind will take a lot of time to complete the task which can be easily handles by an automated machine. AI can also be defined as the capacity of the machine to learn and adapt different things (McCarthy et. al, 1955), also according to Stanford, 2016, is the machine with the inbuilt feature of sensing the requirement and to take required action. With the help of AI technology tourism sector will be more helped as can create a proper data base of the tourist visiting the website and also showing them their desired interest and scrutinizing the task. Even in most of the website the help desk is managed by the AI only for answering the query of the visitors (van Doorn et al., 2017)

RADIO FREQUENCY IDENTIFICATION (RFID)

These are the micro-processor chip which can be placed on the nearby device for creating the communication channel. The chips are made to store, sense and record the environmental data ((Lee et al., 2017). The best example can be seen on the credit and debit card which store all the information of the customer through the embedded chip on it. In tourism system this can be seen in the hotel keys, airport luggage, smartphones for the sake of tracking or GPS (Geographical positioning system) for searching the routes or directions and one can easily reach to the desired location (Cha et al., 2016). This device helps the real- time location tracking and many more to the customers in no time. RFID supports Internet of Things (IoT), which surfeit the service innovation with the sensor-based technologies and innovations (Harwood and Garry, 2015). The technological development will provide a way through with the customer and the service firms can have the data driven cyber space.

VIRTUAL AND AUGMENTED REALITY TECHNOLOGY

Virtual technology or the technology which enables the user to be in the environment where they want to be just by using the virtual technology wearable, these are the devices which give the tourist the chance to virtually present in that area or geographic location and without visiting it personally they can see the place, how does it look like and what are the different places to visit ion that location. Whereas, Augmented Reality will help the tourist to find the road map and to know about the place and details of that location, the example for this could be Google lens, where one can by placing the picture on the lens can get the detailed information about the place. Also, the use of Google map where one can navigate them from the place, they are to the place they want to be.

CRYPTOCURRENCY AND BLOCKCHAIN

Crypto currency is the measure to avoid the factious transaction between the client and the organization. The crypto currency feature acquires the method of transaction with the use of internet technology (Romanova et al., 2018). The term is a fusion of two terms named currency and cryptography. With the help of crypto currency one can opt for secured and completely verified network for transaction and avoid any kind of fraudulent activity during the transaction made. Each and every transaction are secured as well as recorded in terms of algorithm called coins. Each coin has different identifier no. which create the secured environment for the transactions occurred. These recording are done in the form of cypher called **"Block chain"**. Block chain is the type of the technology which is basically the digital account ledger. The entries in the ledger which are recorded separately are done through blocks and linked with the help of the chains with the help of the crypto. Once the block chain has been created, it will not be altered or changed. The block chain is therefore one of the disruptive innovation for the commerce and economic development and also create a value for the exchanges among the customers and the firms and it won't need that both the parties should be in contact within each other and not need to have a trust among the parties (Tillier, 2018). This won't make it that there would be a fraudulent exchange of payments as the use of crypto coins which will give the real time authentication and the transparency of the payment with the use of block chain records (Koenig, 2015). This will also increase the customer engagement in the service providers systems (Helkkula et al, 2018).

INCORPORATING TECHNOLOGICAL INNOVATIONS

With the advent of the incorporating technologies there is a multidiscipline nature of different technologies can be put together for better value- co- creation (Yu and Sangiorgi, 2018; Helkkula et al, 2018). The different types of innovations which are strategically utilized by the service industries while having the radical technologies and creating co- creation could be using the smart environment, gamification, and use of cyber security(e.g., Lu et al., 2018; Bellovin, 2018; Harwood and Garry, 2015).

SMART ENVIRONMENT

The use of sensors, telecommunication networks, IoT and Artificial Intelligence to provide sustainable environment for the sustainable development of technology for the efficient use of the resources from the firm to their stakeholders (Salguero and Espinilla, 2018). With the use of IoT (Internet of Things), a new technology and the shift in the technology that connects the organization with the client or the stakeholders at any time and at any place, this is the application for the new service sector (Lu et al., 2018).

CYBERSECURITY

Cyber security is the integration of technological features that protects the hardware and software against the viruses and fraudulent activity that can damage the data or unwanted use of the data of another person (e.g., Cisco, PwC, Kaspersky) and also help in securing data (Binxing et al., 2018). Cyber security in tourism sector is most important as the tourist perform all their tourism related needs through the websites and for having the secured transaction and to have the saved data secured and cannot be used by the frauds for extracting details from the tourist system and so that the tourist could plan their travel at ease (Luna, 2018).

CO- CREATION IN TOURISM TECHNOLOGY ECOSYSTEM

Instead of beguiling audience with the use of technologies that have deficiency in the value, travel related organizations need to anticipate the brands for being the technologically enhanced platform for increasing the customer service experience and value- co- creation (Weissenberg, 2017). These types of platform aggregate the tourism eco- system and create an exceptional experience around the travel agencies present in digital platforms (OTAa), that is the accommodation, transportation and destination services. Tourist, while travelling to the new destination has the fear of the unknown and will have certain issues (Korstanje, 2011). The Tourist can also face the problem while visiting the foreign countries and the language and food problems they face during their visit, cultural and social issues, currency variations and the issue of safety and security can be other issues during the International visit for the tourist. Tourista re also their own participants in their own destination games (Buonincontri et al., 2017).

There is always a question from the tourist end about the co- creation experiences in the unfamiliar environment that the tourists are visiting. Tourism is also multi-purpose system that the combination of different services and the different associated services that enables the tourist destination visit experience (Inversini and Buhalis, 2009; Mariani et al., 2013). Tourism is considered as one of the social activitieswhere the communication between the client/ customer and the organization (Neuhofer et al., 2012). Value- Co-Creation among the tourist in providing ecosystem has been changing from the macro to the micro level (Storbacka et al., 2016). Micro level is the daily interactions of the customers to the organization or the websites in the eco system co creation (Perks et al., 2012). Co- creation can be also been assumed as business customer processes (Prahalad and Ramaswamy, 2004) which enables more interaction among customers, so enhance their overall customer experience. In the Co- Creation process, ICT also plays a major role in creating digital interaction among the tourist, service providers, hoteliers, cabs, food sectors and creating different attractions for the customers, so that they can enjoy their value co-creation and enjoy the value propositions (Buhalis, 2000). ICT create the proper value-co-creation and will bring the new technological revolution in the service industry (Rihova et al., 2018).

Table 1: Technological Development in Co- Creation for the
Tourism Service Industry

Year	Author	Method	Findings
2014	Neuhofer, Buhalis and Ladkin	Case studies approach	Proposed a nine-field experience typology matrix, determined by intensification of technology and intensity of co-creation
2014	Mohd-Any, Winklhofer and Ennew	An online survey	Develop a 6-dimension instrument for assessment of perceived e-value during customers' co-creation of travel website experiences
2016	Morosan and De Franco	An Online Survey	Mobile commerce habit affects the degree of hotel guests' co-creation which translates into the perceived value of co-creation and future behavior toward a hotel enabling co-creation via mobile technology
2016	Altinay, Sigala and Waligo	Semi-structured interviews	Natural, financial, political and institutional, and human capital enable social value generation in value co-creation processes at individual (micro), meso, and the macro-level
2016	Chathoth, Ungson, Harrington and Chan	A Critical Literature Review	

2017	Buonincontri, Morvillo, Okumus and van Niekerk	A field Survey	Active participation in tourist experiences and interaction between the tourists and providers are positively associated with experience co-creation. Identified positive relationship among experience cocreation, tourist satisfaction, level of expenditures, and happiness. Tourist attitudes toward sharing experiences with other tourists are not associated with experience co
2017	Zhang, Gordon, Buhalis and Ding	A scenario Based Online Survey	Online destination platform experience induces destination emotional experience which translates into destination engagement intentions
2017	Sarmah, Kamboj and Rahman	An Online Survey	Hotel guests' innovativeness and need for interaction with hotel staff drive adoption of co-created services indirectly, through their willingness to co-create via smartphone apps
2018	Connel and Page	A case Study	Identified 4 themes, namely place, people, network and resources, that are needed to create a dementiafriendly tourist destination.

Making the inference from the above table 1, we can find out the three broad areas in the tourism service sector for the technological upgradation and have the power to do the radical changes in the service management for the new future trends in tourism industry. The use of VR/AR technologies and the use of GPS for the location- based services and also the content or social media services.

The urban technological environment can formulate a sustainable framework for strategic marketing of the tourism industry (Bibri and Krogstie, 2017). There is a need for smart tourism destination which will enable the customer and place ecosystem, where there will be a personalized system of experience for the tourist and with the smartness and leadership and proper use of resources and capital, the tourist destination can have sustainable tourism where the people living in that particular region and the tourist both will have the advantage of the tourism ecosystem and will be the part of value-co-creation.

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