

An Impact of Internet of Things (IoT) on Education & Tourism sector

Chaitanya Dev Singh Sisodiya, Dr. Sanjeev Singhal

1. *PhD Scholar, SAGE University, Indore, Madhya Pradesh, India*
2. *HOD PhD Cell, SAGE University, Indore, Madhya Pradesh, India*
(E-mail: *cdlucky77@gmail.com*)

Abstract—Over the past years, the education and tourism division has grown to become a mainstay of the global economy, driven by extensive advances in technology. The Internet of Things (IoT), a system of connected objects is progressively but for sure revolutionizing the way we live. The aim is to emphasize the IoT and looks at some of the major concern related to innovation and their impact on education and tourism sector. The paper discusses about IoT innovation impact on education and tourism industry, commences a detailed study of the usefulness and application of IoT. Research has based on secondary data published by various agencies and organizations with regards to education and tourism sector, followed by a qualitative research build-on deep online exploration. Finding presented that although after enormous contribution by IoT in education and tourism sector, still there are certain limitations and implications over privacy of personal data generated by smart devices, due to overindulgence in technology.

Keywords—*IoT (Internet of Things); Smart Education; Smart Tourism; Travel technology*

I. INTRODUCTION

It's being considered that Kevin Ashton has created Internet of Things (IoT) in twentieth century. However the phrase Internet of Things came in 1999, with an effort of Massachusetts Institute of Technology research labs: the Auto-ID Center and the MIT Media Lab. Kevin Ashton structured its capability as a technique that may contribute to humans in dealing out enormous amounts of data. People have limited time and accuracy by which they fail to capture data in the current scenario, it's still a dilemma. Furthermore, massive amounts of data found online and the development of more tuned processing of data can be done for effective decision-making. Next to virtual reality and cloud computing,

The Internet of Things (IoT) a procedure of connected objects is progressively but certainly revolutionizing today's lifestyle. However it has its own challenges but the results shows potential in tracking data, IoT based healthcare and customer services already been implemented, whereas it about

to get entered in the education field. A research analysis specialist firm Gartner, informed that by 2020 about 20.8 billion devices will be connected with the internet. By which it can be concluded that soon education system will become part of IoT too. The connections between people, devices and data, enhances the capacity and worth of the data gathered by IoT, even it provide support to make the environment safe and smart.

II. LITERATURE REVIEW

A. *IoT In Education Sector*

Madakam, et al. (2015). Informed that in the near future, intelligent virtual objects will be transformed from real world objects with the help of Internet of Things. The IoT intend to merge the whole thing in our world with a general infrastructure, although it keep us updated and gives control over the articles close to us. His research also focuses on its definitions, fundamental and uniqueness of Internet of Things. The main objective of his the research was to give a general idea of the Internet of Things, structural design and significant technologies in our daily world. However, his paper will be helpful for novel researchers who want to do research on IoT, even his research gives superior understanding of the topic.

Banica, et al. (2016), presented a new perception in the field of Information Technology and Communications that is Internet-of-Things (IoT). He stated and conducted a study to express the significance of IoT in the education sector. A number of hands-on has been acknowledged for incorporating IoT in education, particularly in the field knowledge improvement. Even IT&C firms already executed missions in the same field for "smart campus". In study, they validate that the best technical solution for academic world are IoT Platforms with synchronized and limited-area using Cloud Computing assistances.

Martínez, et al. (2016). Notified that these days public are more and more reliant on the Internet in their daily life. This results the Internet of Things (IoT). Consequently, it has

notably amplified the gadgets linked to the Internet; touching approximately of 20 billion linked gadgets, and is anticipated to reach 50 billion in 2020. This has formed big challenge in today's scenario to preserve data due to security and privacy reasons as mobile gadgets need to be connected with each other. His research paper also suggested the outcomes taken from the protocol to establish security and privacy in IoT devices.

McRae, et al. (2016). Informed IoT facilitates enhanced services over the interlinking of information and communication technologies. Whereas a lot of the well-liked writing about IoT concentrates on implications in the residence, its advantages to education are now explored. The formation of less significant, wireless machines that need less power to encounter the main functionality – that is, in lot of situations, to be controlled by a smart phone – offers major new chances for student engagement in the field of automation and remote controlling of devices. However, many of the IoT uses appearing in education are still in their childhood. As such, there is few data of the advantages hazard and access implications of IoT solutions for scholars.

Patel, K. and Patel, M. (2016). Explained the Internet of Things as a transformative expansion. Technologies that could permit lots of gadgets or devices everyday over the internet have vast capability to change our lives. Smart classes, smart homes, smart cities, smart countries, smart agriculture, smart parking etc are some of the applications of IoT, as it having applications for all spheres.

According to Gul, et al. (2017). Internet of Things (IoT) is a rapidly growing network of a variety of different 'connected things.' Use of IoT in educational is similar to a fresh sign of change that has passed new breakthroughs and promises for the development of mutually education process and educational organization infrastructure. He discusses the usefulness and applications of IoT in the field of education. Additionally, it attempted to offer the new research works, challenges and influence of IoT in education

B. Iot In Tourism Sector

Gcaba, O. and Dlodlo, N. (2016). Informed, internet of things (IoT) applications that could enhance the management of tourism activities in South Africa. While information and communication technologies (ICT) have been accepted in several parts of the tourism industry, there is extra room to improve this functionality through the implementation of IoT technologies. The IoT technologies in this research have been classified beneath wildlife supervising, monitoring ocean, monitoring nature, plant and animals monitoring, tourist support services, tourism marketing as identified from the South African Department of Tourism website. A literature

review was conducted to identify IoT applications in tourism in the international arena that would use in the South African environment.

Karafizov, V. (2016). Discussed about the comparatively low technological kind of rural tourism is maybe one of its vital features. Standard practice of Information Technologies is immediate communication with end-users in addition to comparatively low-cost publicity of tourist destinations and assistances. However, the next move in the Information Revolution - the Internet of Things (IoT) is about to enter the Tourism domain and rural tourism businesses could profit from its variety and affordability with domestic devices and technologies. The smart and linked gadgets of IoT shows the capability to present the tourists modern, cost-effectively and modified products and services, getting higher user satisfaction. The devices link with data, respond according to the user's command or preference and can assist the business future, resource treatment or prevent illegal access or health damages. Being a fast evolving, software based object, the IoT should be continuously tested, monitored and maintained for protecting confidential and data reliability.

As per Kaur, K. and Kaur, R. (2016). From the time when the web technology started in the nineties, Tourism has been a key area of application of the World Wide Web. It is also one of the main profit fields of Internet and its associated progressive technologies. There has been a boost in the opportunity of accomplishment of ideas like Internet of Things (IoT), Smart cities, Cloud computing, Big Data etc Smart tourism is the need for such smart cities which own tradition importance. It wants to get jointly the several stakeholders in the tourism sector by way of a general platform of technology and therefore presents a mechanism for their obliging performance through data swap and examination

Dalli, et al. (2017). Tourism is one of the largely profitable sections of internet and its correlated progressive technologies. Smart tourism needs carrying jointly the numerous stakeholders in the tourism industry through a common platform of technology. The advantages and challenges which may happen or have happened in the execution of smart tourism are at last argued.

Cavada, et al. (2018). Clarified The Internet of Things (IoT) facilitates innovative methods for using the synergy among the digital and physical world and thus assure additional interface among tourists and places. They first discuss vital matter, which were discovered in these situations, and are linked to log analysis, system usability and extended forms for learning consumer favorites. Secondly, the lessons learned in these precise instances have notified the useful design. They imagine the rigid

incorporation of limited IoT solutions into a complete mobile data procedure for tourism.

III. IOT INNOVATIONS IMPACT ON EDUCATION INDUSTRY

Technology is everywhere! The plethora of data available on education and the development of new technologies have made us reconsider how students are taught and educational institutions are run. Two things are her to be looked into, first how teachers are teaching students and secondly how institutions are improving campuses with the help of IoT.

A. Teaching

An educational sector that is focused on student learning and with IoT as a supplementary tool can be very beneficial. IoT can join university all over the world to offer a intense learning knowledge for students. It also assists student's associate theory to realistic applications. The advanced learning opportunities can reduce the time.

B. Educational properties

As lots of IoT units are installed on regular basis, schools and colleges infrastructure can expand and grow into digital learning centers. Institutes can keep all the records for efficient and smooth operations of Students, staff members. ERP can be clubbed with the IoT to take decisions and make the staff, students and higher authorities alert during any emergency circumstances.

C. Develop secured learning scenario

There is lot of ways to know how much college and institutes have invested on safety of students and staff members, soon we will witness smart locks that will be intelligent enough to monitor and control any irregularity. All things related to academics can be monitor from roll call to student registration and attendance.

D. Building learning practices effective

Faculties use to plan their lessons thoroughly and deliver to the students and ensure that students get maximum knowledge from it. For the same some of the colleges have accepted digital classroom solutions like interactive whiteboards. Similarly IoT also prepared empirical learning for students through web based system.

E. Assisting Special-need Learners

Records reveal that the total of disabled learners getting higher education has amplified in the last couple of years. IoT devices support students with special needs to conquer the problems they face in relation to their physical imperfections. Thus, the associated entities purposely manufactured to fulfill their requirements which will assist these students turn into self-sufficient.

IV. IOT INNOVATIONS IMPACT ON TOURISM INDUSTRY

Tourism is the biggest industries with a good competition, where clients think modernism at reasonable pricing. Due to the stress, due to high rivalry and need for superior assistances at a lucrative price, businesses from this sector have been the initial movers with IoT.

A. Personalization

Guest can personalize their requirement like changing room temperature, TV channels, air-conditions, heaters, lights etc with the help of tablet provided by hotel which totally integrated with IoT technology. While check-in, hotel can provide electronic key to the guest to enter in room without anyone's assistance whereas smart lock can guarantee security.

B. Immediate Information

IoT will facilitate the tourists to link with numerous gadgets they carry along with them. If tourists want to alter flights tickets, live announcements will be available. Tourist can get directions to reach boarding gates, check-in and board flight. Embedded IoT sensors inside the airplane will monitor and measure the Blood Pressure, body temperature and heart rates of the travelers to allow crew member to take extra precautions.

C. Streamlined Operations

IoT will help out in reform the routine process of airports where travelers can effortlessly trace their luggage through their smart mobiles. Even the luggage itself able to locate its owner and transmit signal by gluing RFID labels to the luggage. It will be useful for vacationers as well as for the airport authorities to locate missing luggage.

D. Customer Service

It's possible to gratify each and every client, leading to brand loyalty. Travel sector can appoint and entertain their clients; with the feedback they can improve the services. IoT

assists to support customers in a superior manner due to the accessibility of appropriate data. It can give clients disliking and likings which can improve the service before complaints.

E. Tourist Experience

Tourists can easily find all information they wants from their finger tips when they enter in the new city, definitely there will be sensors placed all over the city including buses, trees, road side, gardens, bus stops, parking etc. Sensors will grab all information's regarding the travelers and can conclude the overall experience while visiting the particular city.

V. RESTRICTIONS OF THE INTERNET OF THING (IOT)

The growth of IoT needs that we think several issues concerning performance and management.

A. Data management

Though everyone knows managing data will be a problem once the IoT is up and running at full scale, few have really considered the potential data storage problems. According to research from Gartner, there will be an estimated 26 billion units installed globally by 2020 with many more on the way in the following years as the price of processors drops. In the future, it will be possible to mount a processor into everything. So, where is all the data going to be stored?

B. Security concern and the privacy

As there is participation of numerous gadgets and technologies, there is monitoring by several firms, which is a big question of security and the privacy. All the gadgets are linked to the Internet and almost all the information is present on it. This information can be stolen by hackers. It would be extremely disastrous if confidential data is retrieved by unofficial.

C. Compatibility

As gadgets use in IoT is from different manufacturers, which will be linked altogether, the concern of compatibility in classifying and monitoring turn up. While this drawback may go down if all the companies have the same opinion to a general standard, still after that, technical matters will continue.

D. Complication

The IoT is a different and complicated network. Bugs in the software or hardware will have crucial charges. Similarly electricity breakdown can produce a large number of hassles.

E. Lesser Employment

There may be employment concerns in a near future, as on daily basis automation is getting involved in our daily life by which may be less requirement of manpower

F. Management of Life by technology

Technology will be controlling the life of human being in coming years and we will be totally dependent of the same. While, young generation is already in the addiction of the technology, which is going to be serious challenge.

VI. CONCLUSION

The concept of smart education and tourism functioning in several countries is giving revolutionary modifications in the approach the both sectors are working. The advantages of engaging technology and Internet in normal business models away from the help of simple websites are diverse. Because of Internet of Things (IoT) fundamental, a network of smart gadgets can be set up which can improve the working of any business.

Joining education with technology is all about its excellence, influence, and society approval too. If IoTs lift-off, the educational segment will see a full restore. Initially, these will have an influence on the student safety with technologies. Secondly, these linked gadgets will ease awareness. And, lastly, these wearable techs will improve the standard of education for the disabled learners through the data and information. Definitely it's going to take time but the seeds are sown. But, IoT is even now in its early stages and is supposed to transform the travel segment. From facilitating automatic services to guests in hotel rooms and helping them to visit city to checking the functioning of airline engines, IoT will build things easy. Internet of Things will assist in arranging vast sum of data, but attempting to know all that information needs investment in the accurate technology and people to extract actionable findings. It is vital that companies include IoT into their existing plans to influence the advantage of upcoming innovations when they turn up.

Smart education and tourism established on the thought of intellect and smartness is a young idea which is being accepted by countries world-wide. The outcomes are clear in terms of the enhancements in education and tourism practices. Still, there are sure implications like anxiety on privacy of private information and date created by smart gadgets, due to

excess in technology. If process is taken to respond all these issues, the Smart education and tourism concept can fetch massive profits to the students and tourists.

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Chaitanya Dev Singh Sisodiya

BE in Bio-Medical Engineering, MP, India
 PGDBM in Finance, London, UK
 MBA in Finance, Cardiff, UK
 MBA in International Business, India
 Pursuing PhD in Management, MP, India