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Smart Learning Using IoT

Dinesh Mohanty[1]

Student, Department of MCA, YMT College of Management, Institutional Area, Sector -4, Kharghar, Navi Mumbai, Maharashtra 410210

Abstract - *Many Educational Institute instead of using tradition way of learning they make use of latest technology making learning more attractive, interesting and more innovative.IOT technology plays an important role to make education system smarter. The nature of learning process for learning can be enhanced through consistently observing and breaking down the state and exercises of various learning via information detecting gadgets. Applying the concept of IOT in any education environment will increase the quality of education process because student will learn rapidly and teacher fulfil job effectively. In this paper we will discuss the technology which is used to make IOT based education system.*

***Key Words*: Internet of things (IOT), Smart Teaching, Smart Learning ,Smart Classroom, Smart Library, Cloud storage, Online Self Learning, Challenges with Integration of IOT, Smart attendance system, Smart surveillance system, E-learning.**

1. INTRODUCTION

Internet of things (IOT) is a prevalent technology that provides communication and collaboration between the physical and virtual objects .The main structure of Internet of things is based on the data sensed by sensors, tags or actuators and sending it through a gateway to a cloud system. The IOT classrooms in the future include the sensors to validate the access of the educators and students. The user can be detected physically by using smart white board sand desks will be furnished with the RFID or WSN devices. Internet of things can provide the efficient connection between all things physically and virtually. This allows the educative objects, such as students, connecting -online- to the labs, library, didactic materials, assessments, and educational messages and administrative tasks in an efficient manner (effective e-learning) in a large-size virtual classroom.

Internet of things can provide the efficient connection between all things physically and virtually. This allows the educative objects, such as students, connecting -online- to the labs, library, didactic materials, assessments, and educational messages and administrative tasks in an efficient manner (effective e-learning) in a large-size virtual classroom. In addition, e-learning, originated in the 80's, refers to applying electronic tools, soft and hardware applications and web-based processes in the learning system. IOT can provide huge platform for learners and instructors with a wide variety of distance learning devices and object. IOT can be used in various ways such as classroom, e-learning, for attendance of e-class.

2. RESEARCH METHODOLOGY

The main aim of this research paper is to find the technology used for smart leaning Using IOT

2.1 Smart Teaching

Smart teaching is an online teaching process which is much efficient from chalk and talk method. Here the teacher uses online devices or presentations or videos for imparting knowledge within students.

It helps the learner to find aspects supported the large alternative on the market. It also provides the quality 24*7

2.2 Smart Learning

Smart learning is a procedure of learning the things with the assistance of e-devices. Here the student will gain proficiency with the perspectives all the time dependent on student accessibility. It encourage customized learning.

Intelligent technologies, such as cloud computing, learning analytics, big data, Internet of things (IOT), wearable technology, etc., promote the materialization of smart education.

Significance of IOT based e-learning applications are we can share class notes to outside of the classrooms utilizing IOT based eLearning framework. It makes a virtual classroom where numerous students of various study hall in various locale can adapt effectively. IOT based e-learning framework can make a competiveness among local and universal learners.

Smart learning environment consists of software tools i.e. online resources, messaging, blog resources, social network, and analytical and virtualization tools and hardware i.e.

interactive whiteboard, smart phone, tablet and smart object like smart table and e-bag etc. It helps students to learn any time at anywhere.

The information pull approach upgrades the learning capacity and personal knowledge. This methodology encourages the student with satisfactory implicit and explicit information. It improves their intra and inter personal information arrange by utilizing hubs/gadgets/things in the system. This will offer analyst to grow new technique and teacher can learn and all the more successfully and all the more effectively. A student is called smart learner when he/she collaborate with the framework by smart gadgets.

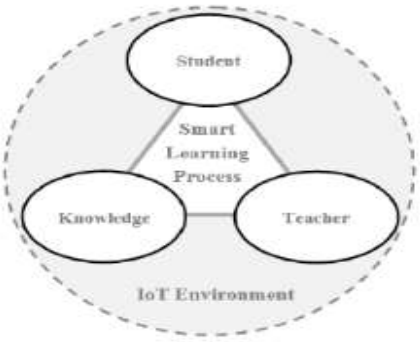

Fig-1: Smart Learning Process in IOT

2.3 Smart Classroom

This is a site of learning and educating. It's the spot of in general educational exercises. Here the picking up, educating, evaluation happens in all respects differently and effectively. Normally, smart class comprise of the e-devices, for example, an advanced screen, projector, and Internet-empowered gadgets.

IOT based attendance system, if every student has a RFID appended ID card. Every classroom contains a RFID per user which peruses every ID cards for update their attendance which makes a smart study roll call study. Also, utilizing NFC (Near Field Communication) based attendance system where every learner has NFC inserted cell phone and a NFC scanner is put in the front of the class. The NFC per user read every ID card through his/her cell phone and it store data in the server.

Fig-2: Smart Board Using IOT

Smart classrooms are consisting of various type of hardware and software module. The technologies used are Projector, laptop, smart phone, wall screen, smart board, Document camera, VCR and DVD etc. Students can more satisfy from lecture, presentation and conversation by smart classroom. Not only the student helps from smart classrooms and also teachers can get a platform to presents their lecture or presentation in a batter way. IOT can transform standard classrooms to smart classrooms with better voice, conversation, movements, behaviour etc. It provides the teachers to presents their lecture, presentation with better impact and student also get the opportunity to learn effectively, a shorter process, more planets, more interesting and also entertains. We discuss two applications in below

- Smart surveillance system: In smart surveillance system to collect information in every class in the form of video we can use has microphone, camera, and sound sensor and PIR sensor. Where raspberry pi operates and control motion detection. And camera is uses to surveillance. Collected data from smart classrooms are stored in cloud for future playback. When a student absents to attend their class then they can easily collect information regarding the classes through his/her smartphone.
- Smart Attendance System: Roll call system is the most important in our school, college or university to identify the student's problem or they are interested or not in their classrooms. We can improve attendance system using IOT technology to provide more effectively and more efficiently. Comparatively less time required to collect attendance than standard classroom. Each classroom contains a RFID reader which reads each student ID cards for update their attendance which makes a smart classroom roll call system. Secondly, using NFC (Near Field Communication) based attendance system where each student has NFC

embedded smartphone and a NFC scanner is placed in the front of the class. The NFC reader read each student ID card through his/her smartphone and it store information in the server.

2.4 Smart Library

We can improve our library system using Wi-Fi based Local Positioning System (LPS) and Near Field Communication tag for easily identify the current position of the books. Generally, a library system performs four facilities like authentication, query and reply, locating the books and issue and return policy.

Authentication: Authentication is very important to protest for entering unauthorized person in library. In smart library each user has user-ID card through his/her NFC embedded smart phone and also his/her fingerprint through biometric fingerprint reader to allow access in library WLAN and also library OPAC system.

Locating the book: In smart library NFC tag are attached to every books of the library. Each rack has NFC tag reader included rack monitor that are connected to the library's WLAN. When some action is performed like book in and out of the library the rack monitor gets information about the book and it store to the library database.

Query and reply: In our smart library each rack contain a rack monitor which store all information about each books. When user queries for a book the rack monitor provide all information regarding the books using NFC tags and local positioning system.

Issue and Return: Every user has a separate account in smart library. Where user can get all information regarding the transaction and it will maintain by the library server. NFC scanners are placed at the entrance and exit of a library. During issues a book at first read NFC tag through his/her smart phone after checking the book are issued in his/her account. During returning a book at first read NFC tag using his/her smartphone after checking condition the book is taken out in the library. Fines are automatically calculated and user can pay through his/her smart phone.

2.5 Cloud storage in IOT based education system:

Cloud storage is an information storage model which connects multiple storage devices to achieve resource shearing and it gives certain storage facility and it accessed by the combination of software and hardware.

In our IOT based education system, RFID (Radio recurrence recognizable proof), NFC (Near field correspondence) and LPS (Local situating framework) and so forth gathers constant and consistent information from brilliant library system, smart classrooms, E-learning system and smart library system. Furthermore, those information are store in cloud for access and control gadgets from anyplace existing in our proposed system.

2.6 Online Self Learning

The principal idea in the auto-didacticism or self-learning is to encourage the learners to study materials without a teacher intervention.

In this model of studying, the students are self-motivated in order to accomplish their homework individually.

IOT allows connecting anything to any things, anywhere and anytime. Students can connect to any labs and libraries (previously discussed) doing experiments, retrieving any data that they need by registering their mobile of physical authentication. They can receive planned homework, doing assessment and assignments, sending the works and receiving the results of their exams.

2.7 Real time access to global library

Online worldwide association with the libraries around the globe can give the worldwide examining possible to students, researchers or teachers. By using the smart technologies such as Internet of things the intelligence feature of IOT diffuses into the schemes, processes, and making the system more effective.

Online worldwide connection to libraries around the world can give possibility of researching globally to students, researchers or teachers. The intelligence feature of IOT diffuses into the schemes, processes, and making the system more effective.

Therefore, IOT empowers smart access to the worldwide library system management.

The IOT and the technologies that help it, construct countless connecting between book accumulations and open libraries around the globe. This enables the clients to associate with the giant book treasury and information banks on the web. The detailed Advantages of E-learning are as follows:

IOT can connect the internal educational system, as well as global points, to the online learners and teachers which means accessing to the huge didactic resources by learners. Using the IOT we can connect the internal educational system, as well as global points, to the online learners and teachers which means more knowledge can be gain by leaners.

The advanced labs around the world can be connected by learner to implement their experiments. Thus they can find many solution to their questions and queries by linking to large volume of data that are stored in internet to increase the performance of the e-learning process.

By building up another plan of IP address (IPv6), practically all gadgets that can get an IP can associate with one another and to the physical or virtual universe. This can create enormous measures of information and connection between items. Human, robots and Software teachers will help students to remotely access the data, from anywhere and at any time. They can answer all questions that have consumed the students' brains, by doing on the web appraisal and giving related outcomes. It is extremely certain that this wonder has a positive effect over student execution.

IOT, practically, removes the existence electronic walls, time limitations and other barriers between learners and large volume of resources such as experienced teachers, results of researches and solutions, and advanced lab tools. As using IOT facilitates this connection and thus restrictions are removed, the speed of required information is increased practically. Students or teachers can access needed e-information within seconds or minutes.

IOT is also responsible for changing the performance of the actual ELearning tools or Medias like wireless connections, security (RFID authentication) and dimension of resources (cloud systems).

3. Basic IOT Structure

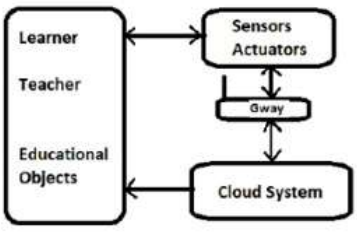

Fig-3: A Basic IOT Educational Architecture

By using the IOT application in the e-learning activities, the learners can interact with instructor, by remotely doing all assigned Works, online assessments and getting the results in a real-time mode.

Both students and teachers, no longer spend their time, to carry out the manually functions. Instead, they'll think about the educational tasks that area unit the principal object within the learning potency of the scholars. They'll use the net technologies like RFID, WSN and Cloud system, to gather knowledge associated with learner potency.

4. LITERATURE REVIEW

Veeramanickam M and Mohanapriya says "Using Internet of Things in education domain has presented a great function to connect and educate the students. Using IOT has modified the classical teaching procedure and the infrastructure of educational organizations. Everything can benefit with IOT whether he is a student or teacher, in the classroom, or in campus. Everything can benefit with IOT whether he is a student or teacher, in the classroom, or in campus. Everything can benefit with IOT whether he is a student or teacher, in the classroom, or in campus. Everything can benefit with IOT whether he is a student or teacher, in the classroom, or in campus. Every-thing can benefit with IOT whether he is a student or teacher, in the classroom, or in campus".

According to Marquez, Villanueva, Solarte , Garcia in " IOT in education: Integration of objects with virtual academic communities" the students, teachers, and physical and virtual things can interact effectively and via efficiently using IOT. Due to the significance of IOT, the Open University in the UK presented a course and named it "My Digital Life" that depends on IOT basics for undergraduate students in the computer science department. The students learned in this course how to deal with IOT for understanding the world and know their role.

Melissa Burns, journalist says Smart learning environments are equipped with digital components that create better, more efficient, and smoother learning process. Ideally, they produce an ideal action between physical and digital realities, permitting students to absorb data from their surroundings and making opportunities for seamless transitions between a spread of learning approaches. Individual and group learning, formal and informal settings, in analogue and digital formats. IOT can

track whether homework was done and collect data about how much time a student needed to complete an assignment. This data can help teachers better understand whether their methods are working, which students need additional help, and which tasks they struggle with the most.

Literature review shows that almost all of the recent studies propose completely different models for classroom. Several advanced and innovative ideas square measure being projected or introduced in education like introducing IOT technology with crowdsourcing in e-education may be helpful for up learning and teaching processes.

5. CHALLENGES WITH INTEGRATION OF IOT IN EDUCATION

For successful integration of IOT devices in an exceedingly classroom environment, , an education provider might got to face several difficulties like network information measure, reliable Wi-Fi association, net analytics, security, privacy, convenience of devices for college students, teacher coaching and value of apparatus, etc.

Some of the challenges are discussed below:

Security and Privacy: Since in IOT-based environment, data is stored at an Internet-based network of connected devices, as devices start to measure and collect data from students, they put student's security and privacy at risk. Any security breach could disclose student's personal information related to an individual's medical record, family financial background or any other private information.

Reliable Wi-Fi Connection: There is a continuous need for new technologies for education, like high-speed wireless networks which provide the bandwidth for audio and video streaming of lessons.

Management: Some devices and applications are not compatible and can hinder the organization's ability to build an IOT setup that's both reliable and available to all users. For successful implementation of IOT, an educational institution must make sure that both its IT equipment and teaching approaches support the use of IOT in the classroom. Although risks and potential barriers are associated with technology, educational organizations may get advantages from exploring and experimenting with IOT options.

Cost: The whole setup of an IOT-based educational institution can be expensive. Therefore the cost of devices and equipment is another challenge

The students, teachers, and physical and virtual things can interact effectively and via
Efficiently using IOT

6. CONCLUSION

From this paper, we got the knowledge that IOT can change the traditional education system and it will help to make the education system smart. In today's world due to IOT based education system we have the facility of smart classrooms, smart attendance system, smart library etc. From this study we tried to obtain information about different IOT based applications that are used to implement a smart education system. This provides important applications and technology which are required to make a smart education system and it will help the researchers to think new IOT based applications and new technology.

7. REFERENCES

[1] Majid Bayani, Karol Leiton, Mayra Loaiza, "INTERNET OF THINGS (IOT) ADVANTAGES ON E-LEARNING INTHE SMART CITIES", International Journal of Development Research,2017,pgno:1,

[2] Shrinath et al,"IOT Applications in Education", International Journal of Advance Research and Development, 2017, pgno: 22.

[3] Understanding the Internet of Things (IOT), GSM Association, (2014)

[4] Hicham EL Mrabet, Abdelaziz Ait Moussa,"Smart Classroom Environment via IOT in Basic and Secondary Education", Transactions on Machine Learning and Artificial Intelligence Vol 5 No 4, Aug 2017

[5] Prof. Rohini Temkar, Mohanish Gupte, Siddhesh Kalgaonkar, "Internet of Things for Smart Classrooms", International Research Journal of Engineering and Technology (IRJET), Volume: 03 Issue: 07 | July-2016

[6] Nenad Gligori, Ana Uzelac and Srdjan Krco" Smart Classroom: Real-Time Feedback on Lecture Quality", Work in Progress session at PerCom 2012, Lugano (19-23 March 2012).

[7] Sanjana Prasad, P.Mahalakshmi, A.John Clement Sunder and R.Swathi " Smart Surveillance Monitoring System Using Raspberry PI and PIR Sensor", Sanjana Prasad et al, / (IJCSIT) International Journal of Computer Science and

Information Technologies, Vol. 5 (6), 2014, 7107-7109 ISSN: 0975- 9646.

[8] Ching Hisang Chang" Smart Classroom Roll Caller System with IOT Architecture" 2011 Second International Conference on Innovations in Bioinspired Computing and Applications.

[9] Shivaraj kumar T.H, Sriraksha T.A, and Noor U saba "An IOT Based Secured Smart e-Campus" International Journal of Humanities and Social Science Invention ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714 www.ijhssi.org ||Volume 6 Issue 3||March. 2017 || Pgno.88-93.

[10] Veeramanickam M, Mohanapriya M, "IOT enabled Futurus smart campus with effective E-learning: i-campus". GSTF J Eng Technol (JET). 2016; pgno: 81

[11] Marquez J, Villanueva J, Solarte Z, Garcia A. IOT in education: Integration of objects with virtual academic communities. Paper presented at: 2016 WorldConference on New Advances in Information Systems and Technologies; 2016; Recife, Brazil