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FUTURE GENERATION MECHANIZED EDUCATIONAL SYSTEM WITH IOT-A STUDY

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ABSTRACT: *Man made the machines and now the machines are ruling, guiding and also presenting a new path of living style for the man. The Internet of Things (IoT) has been called the next Industrial Revolution it will impact the way all businesses, governments, education system and consumers interact with the physical world. Educator are finding new innovative methods to connect with students by conducting seminar's creating lesson plans with new techniques, relevant discussions, classroom projects and implementing new digital teaching methods for better understandable approach. Technology is used for transforming education form traditional class room to virtual class room with digital teaching methods of teaching and implementation of live discussions with Social media blogs and discussion forums. The IoT helps the user by simplifying and access to essential information automatically in any type of educational or real-world setting. The Internet of Things is enabling technology researchers to develop smaller and more affordable wireless systems that consume less power and can be integrated into almost any type of device.*
Smart IOT in educational institutes help in Personalized learning with adaptive e-Textbooks , video recorders for lecture capture, connectivity to students devices , notebooks, tablets, smart phones, cloud based storage structure to store students information and getting connected with single touch sensor application, wearable for athletics creating sensor tracking parking area.
Our study is to bring IOT for the automation of regular activities conducted in educational institutes and improve the quality of education. The study focus on connecting the sensor devices of various area in the campus to the portable identity card sensor screen of the person and retrieve various related information for the user and display alert notifications in the registered mobile devices.

Keywords: Internet of things, Revolution, Technologies.

I. INTRODUCTION TO IOT

In the digital era Internet is used to connect people and enable them to share information, mainly in the form of text, photographs and videos. Now, it has progressed in connecting physical objects.

Devices other than standard products, such as smart phones, pc, tablet, I phone etc. when connected to the Internet encompass the Internet of Things (IoT). In general the 'things' are handled uniquely, using a uniform resource identifier or an IP address. The objects can transmit data to each other and perform physical acts using sensors. Leading technology research and advisory company Gathered that there will be nearly 21 connected things all over the world by the year 2020..

Influence of IoT is changing various fields and sectors from digital to sensor application with one touch instruction from smart phone.

IOT in education: Therefore, the IoT has the potential to cause major disruption in a variety of fields. It has a significant impact in areas such as customer service and healthcare. As schools also become part of this evolution, the Internet of Things is likely to bring significant changes to the education sector as well.

Despite the proliferation of technology, mainly in the form of mobile devices, most educational institutions are yet to incorporate it actively into learning. Most institutions have not reached out and connected to each other and few teachers share data among themselves, except for research projects. Adoption of technology at a massive scale is needed for the potential realization of the Internet of Things and fully engage to move beyond the classroom for more authentic and relevant learning. Moving beyond online tutorials and virtual classrooms, educational technology is progressing towards greater heights with an aim to innovative sensor implementation of less effort more effective teaching aids with self automatic administrative procedures for effective change in education sector.

1. Smart Home : Smart Home has become the ground-breaking steps of success in the residential spaces and also predicted that Smart homes will become as common as smart phones in coming years.

2. Wearable's: Wearable devices are installed with sensors and software's which collect data and information about the users to extract essential insights and alert user regarding health fitness and entertainment requirements.

3. Connected Cars: Automatic digital vehicle to optimize and implement basic and user specified operation, and also ensure self maintenance, passengers comfort by using onboard sensors and internet connectivity are the functions of these device.

4. Industrial Internet: creating brilliant machines in empowering industrial engineering with sensors, software and big data analytics.

5. Smart Cities: not only individual but change the phase of society with automated transportation, sensor energy management systems, smart water distribution, urban security and environmental supervising are the examples of internet of things applications for smart cities.

6. IoT in agriculture: farmers are using meaningful insights from the data to yield better return on investment. Sensing for soil moisture and nutrients, controlling water usage for plant growth and determining custom fertilizer are some simple uses of IoT.

A daydream about IoT in education, shows that students using new technologies to complete projects learn new things practically with virtual reality. In science class, they might use RFID to tag sample specimens in the wild, textbooks could be scanned to receive instant additional resources and assignments. But considering the IoT is about creativity above all else, these common suggestions don't do it justice.

II. LITERATURE REVIEW

1. AUTHOR:ANDREW MEOLA: DEC. 20, 2016.

According to him The IOT, the connection of devices to the Internet, is in the process of transforming numerous areas of our daily lives. The IoT can start the education process as early as kindergarten and can continue to do so through 12th grade, but perhaps the most profound effects occur in higher education.

2 Authors: Michelle **Selinger, Ana Sepulveda, Jim Buchan** Cisco Consulting Services and Cisco EMEAR Education Team October, 2013.

Title: Education and Internet of everything:

According to them IoE's potential impact on making education is more relevant, engaging and rousing learners, and enabling faster time to mastery.

3. Author: A.V.Kavitha Title: Waves of IOT in Higher Education. International Journal of Innovative Research in Advanced Engineering (IJIRAE) ISSN: 2349 Volume 3 December2016) According to the Author , IOT will enhance the quality of life, communications, and delivery of services, all the public of the country should be aware of IoT along with security threats and the precautions to be taken and also shared their views that Andhra Pradesh state government is a bit ahead in taking the digital initiatives and soon become a smart city with smart education.

III. OBJECTIVES

- To Study impact of IoT in Education Sector.
- IoT impact in Global and Higher Education system.
- To study the applications of IoT in education system.
- To Study the Challenges faced by IoT in educational industry.
- Model and implementation.

IV. RESEARCH METHODOLOGY

The study was conducted by collecting data from various secondary sources as new paper articles, reviews, research papers and blogs, and created some charts and models for presenting the information in clear format.

V. OUR STUDY AND INTERPRETATIONS

Objective -1: To Study the impact of IoT in Education Sector.

Connectivity must be used creatively:

Compatibility from technical educational system to smart digital school is far more than making lives "easier." Implementation of smart technology to traditional methods is ultimately saving educators time and venture it for better purpose. This is marvelous, but utilizing technology itself does not make better education system, actual changes will come from promoting a better not faster learning environment, consequently connected computers have mostly been making the work of teachers easier. Teachers save time finding, connecting and implementing new resources, thanks to their connected technologies. But that is only the beginning the developers want to take the IoT in the classroom to a much higher level by focusing on technology utilization, not only in teaching but also in to teaching automation system. The program is also deeply rooted in being able to share knowledge and data between schools. Iot will make a remarkable change and lead success in education system with slow launch very nuanced ways. Some schools may use it to save money or harness data, some will prepare students to be highly tech-literate, others will find creative uses for their specific needs. In order to include the IoT in education, our understanding of education must change.

Iot Transformation in Education system will help

1. Connecting Learners Worldwide: not only teaching with innovative methods but also sharing their ideas to many more educators world wide will help in progression.

2. Supplementing Textbooks: There is no limitation for grasping knowledge restrictions are made with geographical huddles or physical availability of textbooks IoT make this wide by providing information world wide by supplementing the traditional textbooks.

3.Helping Students With Special Needs: providing notes or writeup to the students in their absence, online help and training facility to the students in their mobile devices, relavent alrearts regarding the classes and projects to be completed will help the students to make them up to date.

4.Improving Campus Safety: Authentication based entry, identification using biometric tools and automatical updation of the information to database will help to improve campus security and also maintain proper documentation regarding students and faculty. Digitized wrist bands and identity cards facilitate to track students, staff and visitors. Data on the last-known locations are stored on a server and it helps ensure that every area on campus is accessed only by the right people. These also enable cashless payments, by also acting as digital wallets, to improve security and protect data from hackers. Tracking of bus routes is enabled by a GPS-enabled bus system so that students have a safe journey to and back from school/campus and parents are aware of the children's available location.

5.Increasing efficiency

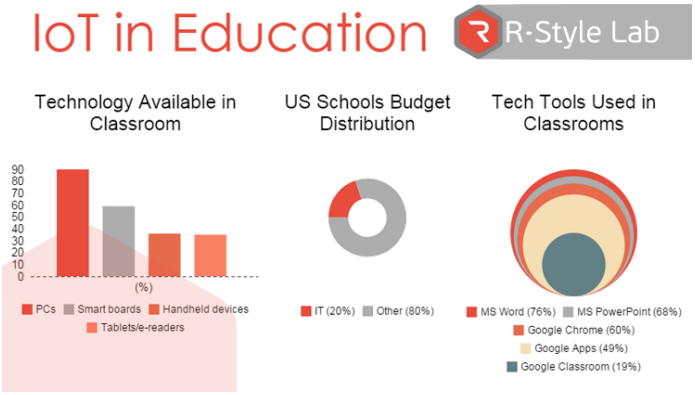
Reforming the day-to-day operations of schools using IoT helps focus more on actual teaching activities by reducing the time and effort required in manual accomplishments of those.

For example, connected devices that automatically detect the presence of students can eliminate the need for taking attendance manually and submitting the information at a central office, among other time-consuming activities. RFID technology is used as supplement for lab projectors, and equipment for better and efficient knowledge transformation.

It is to be considered from the above discussion that Internet of Things is transforming the education sector and changing the learning process with three S, Simpler, Supper fast and Safer.

Objective 2: IoT impact in Global Education system.

The Internet has dominated the traditional education system with digital supplements for teaching and e-learning has become common practice for better and clear explanation for all subjects both in school and higher education system. Keeping this as reason the applications of the IoT in education are numerous, and the implications for this are marvelous all



over the world.

The growth in mobile technology and the IoT allows the educational institutes to improve the safety of their campus, keep track of key resources and enhance access to information. Teachers can even use this technology to create "smart lesson plans," rather than the traditional progression for the academic year. According to global study Iot applications have greater impact with 33% Business and Professional segment, and 13% with Government organization and 11% in retailer and trading and 8% in education.

IoT in Higher Education

The above discussion proves the impact of IoT in educational system results to productive education with excellent transformations. Moving to higher education system where the scope is global IoT results with profound effects in higher education.

Digital devices are ruling the young generation, from basic calculation to daily routines youth are depending on the mobile devices. There is a remarkable change from paper books toward tablets, mobile phones and laptops, with all of necessary information at their fingertips, students can now learn at their own swiftness and have a nearly identical educational experience in their homes and in the classroom. This provides convenience and create a effective teaching and learning processes.

professors can focus on the actual, personal instruction that is most valuable to their students.

Professors gather data from various inter connected devices through cloud to their students and then determine which ones need the most individual attention and care. These statistics also let teachers properly adjust their lesson plans for future classes.

Not only inside the class room but universities can use connected devices to monitor their students, staff, and resources and equipment at a reduced operating cost, which saves everyone money.

And these tracking capabilities should also lead to safer campuses

IoT wearable devices can be personalized to each student to track the information from admission, recruiting and enrollment processes without communication delay.

Personal alert messages to students on recommendations on relevant academic topics/courses that they perhaps hadn't considered.

Internship opportunities that could best suit their academic pursuits. Based on the students' behavior (hardworking students struggling for academic's) alerts can be sent so that administrators can reach out and act more quickly to resolve issues.

In addition, students' profiles can built over the length of their engagement with a campus, providing a better way for the institution to also assist them as alums, especially when coupled with employment activities after studies.

The truth behind the above discussion is IoT for higher education result with success based on the below logic:- more the data captured about the different interactions that are happening continuously, the more improvement's practically and theoretically with the involvement of all the parties in and out the campus.

Objective 3: To study the applications of IoT in education system IoT not only provides valuable imminent, but it also democratizes that information through low cost, low-power small devices, which still offer high performance. This technology aids in managing costs, improving the quality of education, professional development, and facility management improvement through automatic connectivity with one touch device. Major functions performed with IOT are

- Student response, performance, and behavior
- Instructor response, performance, and behavior
- Facility monitoring and maintenance
- Data from other facilities

Few applications:

1. Students attendance can be recorded by giving them the Smart Cards (with IOT)to gain access into the college campus, labs, library and classrooms.

2. As soon as a student enters the college campus, they get notifications regarding the availability of the library books he need for the day's schedule.

4. In CBCS system, student can get customized schedule about class venue as they enter the campus or when ever changes are made. (as they have shifts in class rooms for selected subjects at selected time)
5. Smart cards could be tracked for conveying information to parent's cell phones regarding students attendance, marks, and other achievements of the student, smart doors, cameras used to monitor and control movement in different facilities.
6. Used to store student profile and intimate with employment alerts.
7. Health of students living Hostel can be handled by adopting fitness devices.
8. Interactive projectors, touch boards, automatic lecture capturing could be done by connecting to internet and download required content on board with one touch .
9. There is a possibility to connect educational resources worldwide both for faculty and students.
10. IOT can also alert the staff about service equipment before a problem arises.

Components required for IOT establishment

In order to establish the connection between Iot devices and other components for better updating and modification over the time to achieve a complex task the following components are required.

1. ID with sensor identification: A unique method of object identification is needed and also used to track with GPS. An ID can be assigned to an object based on traditional parameters such as the MAC ID, IPv6 ID(universal identification method).

2. Meta information: not only unique identification to relate the object and sensor some meta information about the device to describe the form and operation to create proper relationship.

3. Security controls: only the authorized person should access the device and specify instructions. These are typically referred to as owner controls.

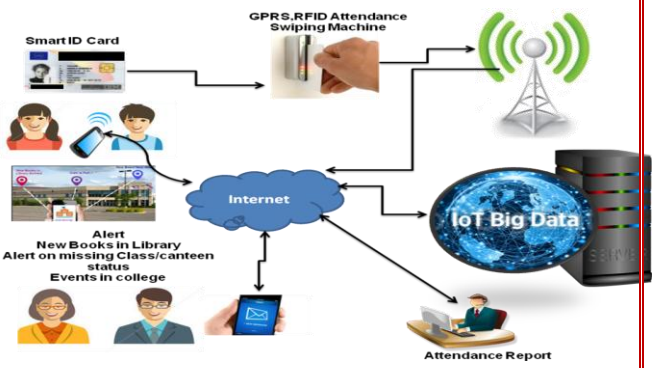
3. Maintaining Database of student's submitted work and could be analyzed to give adaptable advice for students, learning at own swiftness and intellectual ability could be achieved easily.

4. Communication: in order to establish basic connection between devices . RFID (Radio Frequency Identification) and NFC (Near Field Communication) are used. For the medium range, they are Bluetooth, Zigbee, and WiFi. Communication in the IoT world requires special networking protocols and mechanisms.

5. Relationship management: manage the connectivity with other devices to stores and gather information about other devices connected together to control and modify the instructions.

6. Service composition: The ultimate goal of having such a system is to provide better integrated services to users and customized based on user choice.

IOT in education system the functionality



Difference between Traditional and smart Education system

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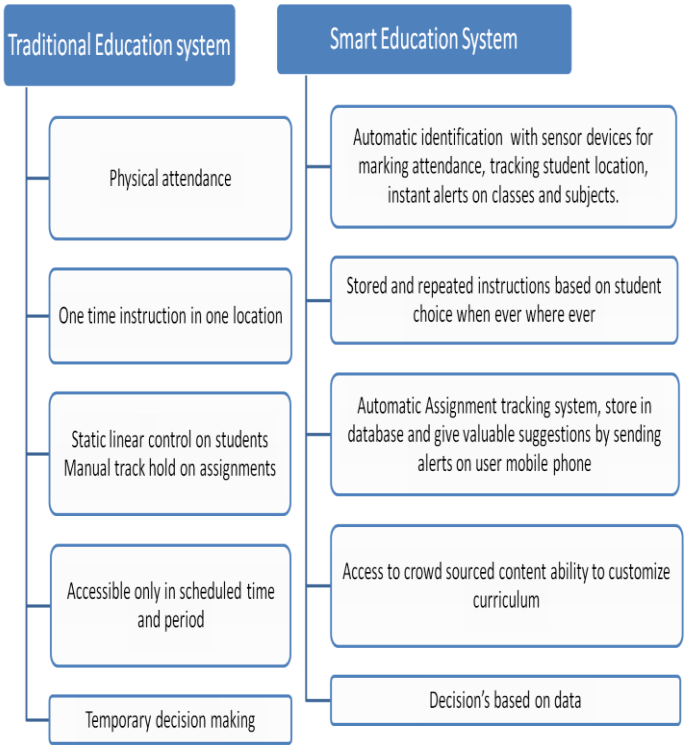

Objective 4: challenges faced by IOT in Education sector

- Big data explosion could be a major challenge as multiple devices are connected as objects to internet.
- No proper standard protocols for connectivity for both wired and wireless devices –yet to be established.
- Lack of proper security protocols: data is open in hands of hackers as stored in cloud.
- High speed internet and power are some technical issues related to connectivity

V. CONCLUSION: IoT facilitates the customization of education to give every student access to what they need at any time with their smart phone and smart card connectivity. The student simply utilizes the system, and performance data primarily shapes their design. Parents have track record information about the students with mobile alerts regarding attendance, location, performance. This combined with organizational and educator optimization delivers highly effective education while reducing costs

IoT in the classroom combines the benefits of IoT in content delivery, business, and healthcare. It customizes and enhances education by allowing optimization of all content and forms of delivery. It enables educators to give focus to individuals and their method. It also reduces costs and labor of education through automation of common tasks outside of the actual education process.

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