

A Study on Role of IoT (Internet of Things) in College Education for upcoming future learning

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ABSTRACT: In future, learning will get possible by variety of technologies. For educational development of our society, IoT will enhance learning experience. The ultimate involvement of IoT will approach new heights of learning experiences within colleges or universities. This enhancement will improve working efficiency, learning experiences and also student performances. Our study is all about the involvement of IoT in the college education and also its improved performance & risk analysis. The working culture of higher educational institutions will be improved through IoT. Furthermore, this will create new horizon of learning. In this discipline, entire academics, research work and associated students will be at unique position about to discover new milestones of IoT and its related devices, services & variety of applications. Various research organizations and educational hubs will offer such useful new trends towards advanced learning. Apart from this, IoT will have various upcoming challenges towards college education. In concise manner, our paper is focusing on potentiality and capability of IoT for college education, impact of IoT on educational institutions and also debriefs various upcoming challenges of IoT in college education.

KEYWORDS: IoT, object, technologies, interconnected devices, network, pervasive

I. INTRODUCTION

Our daily routine is getting affected with the process of IoT. IoT is having pervasiveness and also boost solutions to plan autonomous system. The development of IoT is upcoming trend where involvement of sensors & capabilities to mute out interlude between external world & associated devices. This conceptual shifting to the new proposal is having embedded sensors to related devices & enables interconnection between various devices through internet.

The development of IoT is getting fast due to which its growth creates aggravation and impatience to the surroundings. The concept of IoT will transform various aspects of educational institutions like colleges and universities. Now day's educational institutes have a chance to direct the development of technical education & proposal of IoT. Hence IoT will be the future technology & this will impact on internet, as predicted by educational research organizations & re-solvent.

The IoT objective is to approach advancement of machines, information technology sector & interconnection between devices. A variety of IoT applications have been planned in various fields like consumer support, health care, pollution control, traffic control etc. Furthermore, IoT is also approaching educational sectors or institutions like colleges or universities. The upcoming learning experiences within universities will confirm futuristic transformation of knowledgeable personnel, related work and also economic feasibility. Our paper is aiming at fundamental concept of IoT in academic environment, futuristic impact of IoT in the educational sector and related challenges in this discipline.

II. FUNDAMENTAL COMPONENTS OF IoT

Various components are there about to develop an IoT system. Some of them are as follows:

- Sensors:** Sensors are important component which capture analog signals. As per requirements & domains, various sensors like light sensors, gas sensors, temperature sensors etc are used. Regarding to requirements of sensors various parameters which are actually based on these sensors should be kept in mind. These parameters are like accuracy towards inputted data, reliable input and purpose etc.
- Network:** Signals are transmitted which are retrieved by interconnected sensors over the

network and then forward to various components of network like routers, bridges & also to varied lengthy networks like LAN, MAN & MAN etc. Through different technologies like WiFi, Bluetooth, Ethernet & LiFi we can connect different parts of network to the sensors.

- c) **Standards:** The aggregation of all activities of handling, processing & storing the data collected from the sensors, depends upon the use of various standards which are again depended on IoT applications which is used. Standards can be technological (Wi-Fi / HTTP/Extraction, Transformation, Loading (ETL)) & Regulatory standards.
- d) **Intelligent analysis and actions:** This analysis is run by cognitive technologies & the associated models that facilitate the use of cognitive technology. These cognitive technologies have ability to process diversified information, vision & voice. Intelligent actions can be defined as Machine to Machine (M2M) and Machine to Human (M2H) interfaces.

III. CONCEPTUALIZATION OF DIGITAL CAMPUS ENVIRONMENT

Almost all types of information can retrieve by students from various universities with the help of digital campus environment. The upcoming innovative technologies are involving which affect the entire administration of universities. Through such digital environment, universities can digitize their academic functionalities and also conceptualize their own customized methodologies which will allow both students or researchers and entire academics to work together. The digital campus encourages, promotes and supports consistent learning. Every university which considered to be digital must have upcoming technologies through which teaching, learning & research all come together.

The entire digital campus environment can minimize risks towards security, related costs and also provide tools for students, researchers & academic staff. Such facilities provide true values for operational development of associated colleges or universities. The digital campus environment delivers enhanced IT infrastructure to serve interconnected network, related security & portability for relevant services within the campus environment. This environment also implements IoT applications which will enhance learning and teaching experiences. This enhancement of professional and academic activities will improve outputs. IoT applications have an extension from conventionality of applications as involvement of

ubiquitous sensors and related data are there. Various IoT enabled digital campus applications are there for management and control aspects, maintenance of authenticity & security, video enabled information system, student's attendance and traceability and monitoring etc.

To resolve demands of universities, WSNs (Wireless Sensor Networks) plays a vital role within the digital campus environment. This network is capable to connect associated students, teachers or educators and researchers with their location information. Through this interconnection, colleges or universities will enable with pervasive learning and related training.

IV. BENEFITS OF IOT ENABLED COLLEGE EDUCATION

As we know IoT is a web of interconnected devices which generates levels of data by information sharing. Because of this, IoT has made a huge impact on college education. A bunch of benefits are there for IoT enabled campus environment, some of them are as follows:

- a) Long term connected academic facilities

Latest technological facilities are being innovated which can able to attract students and educators. The IoT can help colleges or universities to provide enrich learning experiences for students and teaching experiences for teachers too.

- b) Secure interconnected infrastructure

The enhanced infrastructure in colleges or universities can get connected to the interconnected devices of students, teachers and researchers so the user can experiences better academic spaces. Students can able to find out real-time availability of their peers whereas researchers can find out real time availability of laboratory. The entire campus can get secure with the use of cameras, RFIDs, associated sensors and other interconnected devices on the IoT. With such infrastructure security team can observe and monitor whole campus building. Hence use of IoT delivers better security and response.

- c) Individual learning solution

IoT enabled devices can retrieve information related to students like by the use of learning devices, fitness trackers and adjoining cameras, colleges can setup individual learning solution for student individual. This can provide learning and study pathway plan. Furthermore, they can also provide enhanced study materials to students for a specified title. Interconnected sensors would be able to get feedback for learning state & concentration of students & that can be share with

respective teachers about to improve better connection with their classes.

VII. THE FUTURE OF COLLEGE EDUCATION WITH IOT

The continuous thriving in to the forthcoming, colleges and universities and also research organizations require about to plan a proper destination to their students or researchers. Due to continuous development of IoT, a bunch of educational institutions have taken initiative to concentrate on the upcoming technologies and related applications of IoT, which is also applicable at universities level. The internet has become an important radical part of colleges, universities and educational institutions and also digital learning is usual one to come up with learning routines in colleges. Undoubtedly, IoT will provide better educational efficiency in learning environment of campus. IoT has ability to support in various educational activities like improvement towards learning relevant learning method, improve efficiency & economically feasibility towards management.

There is a strong prediction that through IoT, numerous issues which are associated with conventional teaching can be solved. If we consider an example regarding to those students who are introvert by nature & are having lack of concentration during classroom teaching. As we know student involvement is must during class room teaching as tis helps to know learning attitude of learners. In this discipline, IoT is very helpful to resolve such problems. With IoT, we can create a remote session through which learning can get possible for students. In this manner student has freedom about to opt his or her learning environment. After proper satisfaction with environment, the tutor can start the teaching process. In more interesting way, teacher can deliver his or her lecture in the same way as in a physical classroom. As availability of smart board which is having stylus & the learner can visualize view onboard from anywhere.

IoT is also helpful to solve problem of availability of book references in library. By the use of IoT student can scan QR code of the course book & retrieve softcopy of that book to their digital device. As availability of smart bands which will be linked with teacher's smart device or laptop, via which attendance can mark very easily.

VI. UPCOMING CHALLENGES IN IOT ENABLED COLLEGE EDUCATION

There are varieties of opportunities & upcoming challenges towards IoT enabled college

education. The continuous development of forthcoming technologies like pervasive computing, IoT enabled cloud computing, bigdata & data analytics, are a greater supportive about to enhance learning experience & also to improve quality research. In this discipline, IoT is having variety of challenges; some of them are as follows:

- Bigdata & cloud computing will be a greater challenge as more and more interconnected devices , home appliances, vehicles & other related object will be get connected to internet.
- Privacy & security could be a greater challenge as entire processed data is stored in cloud storage which is easily approachable, due to which unauthenticated access can get possible.
- Internet speed is the major checkpoint on which entire accessibility is going through, so this enhanced internet speed could be a future challenge.
- As we know every interconnected network is having standard & a variety of standards are yet to be finalized which will establish connection between devices.
- Many universities are still not having a proper plan for cost sharing and predicting cost for IoT infrastructure so such financial issue will be a remarkable challenge.
- IoT enabled college education system should maintain learning & also proper evaluation of work from student side. Hence design and development of related tools and methodologies will be a goal which will be utilized by students, teachers and research organizations about to improve quality education and research too.

VII. CONCLUSION

The continuous development of IoT is at advancement stage via which educational hubs & organizations can now able to access relevant information and also develop smarter strategy by which concept of smart education can approach very well. The capabilities of IoT enabled system are very vast about to achieve valuable higher education. Through this learning speed can be improved. Our paper is all about the overview of capabilities of IoT for college education & also about to improve benefits of IoT with proper recognition of challenges. Hence, forthcoming concept of IoT enabled college education will be more effective for students, teachers, colleges or universities and also to research organizations.

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