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## IOT Application in Education

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### ABSTRACT

“The Internet of Things allows people and objects to be connected Anytime, Anywhere, preferably by means of any path/network and any service.” In this article, there is a brief overview of IoT areas and possible solutions for use in Education sector“. The article consists of three main parts: first, an overview of IoT applications, second, IoT in Education sector, and third, valued added things in education though IoT.

**Keyword:** Smart Education, Surveillance, BYOD, Security System, Alerts, IOT Applications.

### INTRODUCTION

Technology has changed the world of education. From the use of tablets in the classroom to the innovative learning process of open universities, education has transformed the way we lead life. However, these progressions are negligible compared to the mass revolution that is happening in the education world due to the application of Internet of Things (IoT). [1]

The IoT—which links people, processes, devices and data—augments the quantity *and* value of the information we can collect, allowing the stakeholders of educational sector to turn data into valuable information as never seen before.

With the initiation of mobile technologies, the educational institutions can now keep track of overall resources pertaining to education. IoT is playing the key role in teaching, Learning and even in assessment. From KG to PG in all aspects of the education institution, the IoT is becoming the need of the hour. The implication of IoT will help the overall delivery of the resources in an innovative manner to the participants. The IoT has the potential to impact every aspect of student learning. This insight provides stakeholders with a real-time view of students, staff, and resources. It helps in decision making, automatic execution and providing security features. [2]

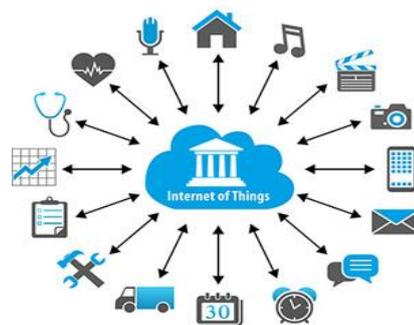
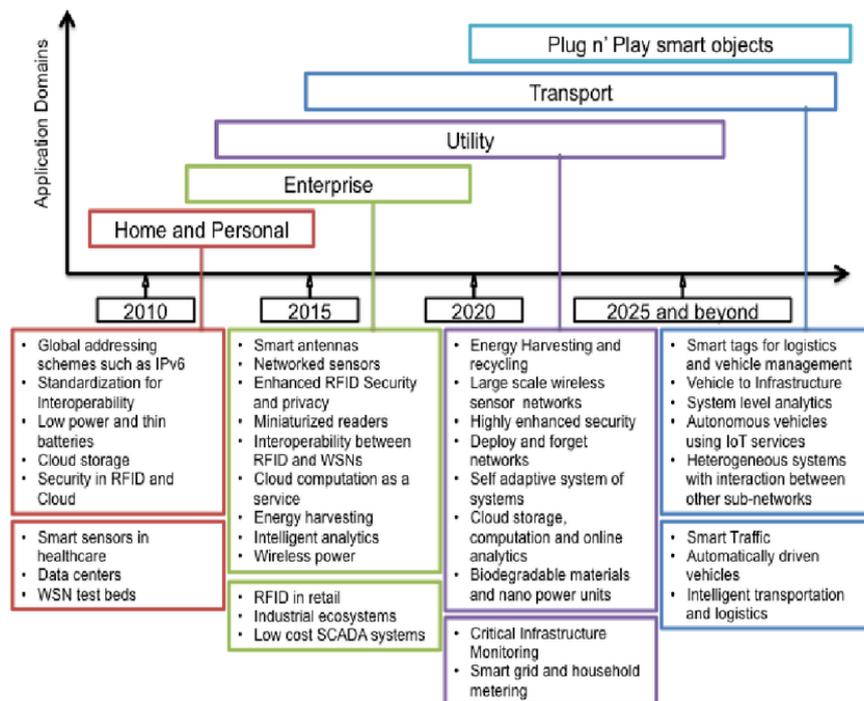


Fig-1 IoT Applications

## IoT Applications

We can have myriad IoT applications in our daily life  
Some of the normally installed applications include: [3]

- Multimedia sector for the easy manipulations.
- Home automation, components management and security implementation.
- In tracking the logistic service this is very helpful
- The scheduling aspects can be done effectively through this
- To keep track of transportation units, the IoT is very much needy
- The health industry has ample benefit from this
- E-Health system spanning from blood pressure, heart rate monitoring to remote surgeries.
- Environmental monitoring including air, water quality, soil, wildlife monitoring.
- Infrastructure management and monitoring of urban and rural assets.
- Smart parking, smart traffic control, a vehicle to vehicle communication etc.
- Industrial projects in the food industry, agriculture, surveillance etc.



**Fig-2: A roadmap of key developments in IoT research.**

There has been a rapid growth [4] in numerous IoT applications' area due to communication possible among smart devices and things. Thus, it directs the development of many IoT application areas resulting into the smart environment, smart people with the smart living economy, and smart mobility.

IoT in Education

### Smart Education [5]

Intelligent technologies, such as cloud computing, learning analytics, big data, Internet of things (IoT), wearable technology, etc., promote the materialization of smart education. Although a great many studies focus on how to create smart environments or how to use smart environments for their learning, without a deal with how to use serene data for learning purposes.

### Smart Teaching

Smart teaching is a special teaching approach which is totally different from chalk and talk method. Here the teacher imparts the education through various means with the help of electronic gadgets. It helps the learner to learn the aspects based on the vast choice available. It also provides the quality content 24x7.

### Smart Learning

There is no clear and unified definition of smart learning so far. Multidisciplinary researchers and educational professionals are continuously discussing the concept of smart learning. Smart learning is a process of learning the things with the help of e-gadgets. Here the learner is going to learn the aspects all the time based on learner availability. It supports personalized learning.

### Smart Classroom

This is a place of learning and teaching. It's the place of overall educational activities. Here the learning, teaching, assessment happens very differently and effectively. Usually, smart classrooms consist of the e-gadgets, such as a digital screen, projector, Internet-enabled devices.

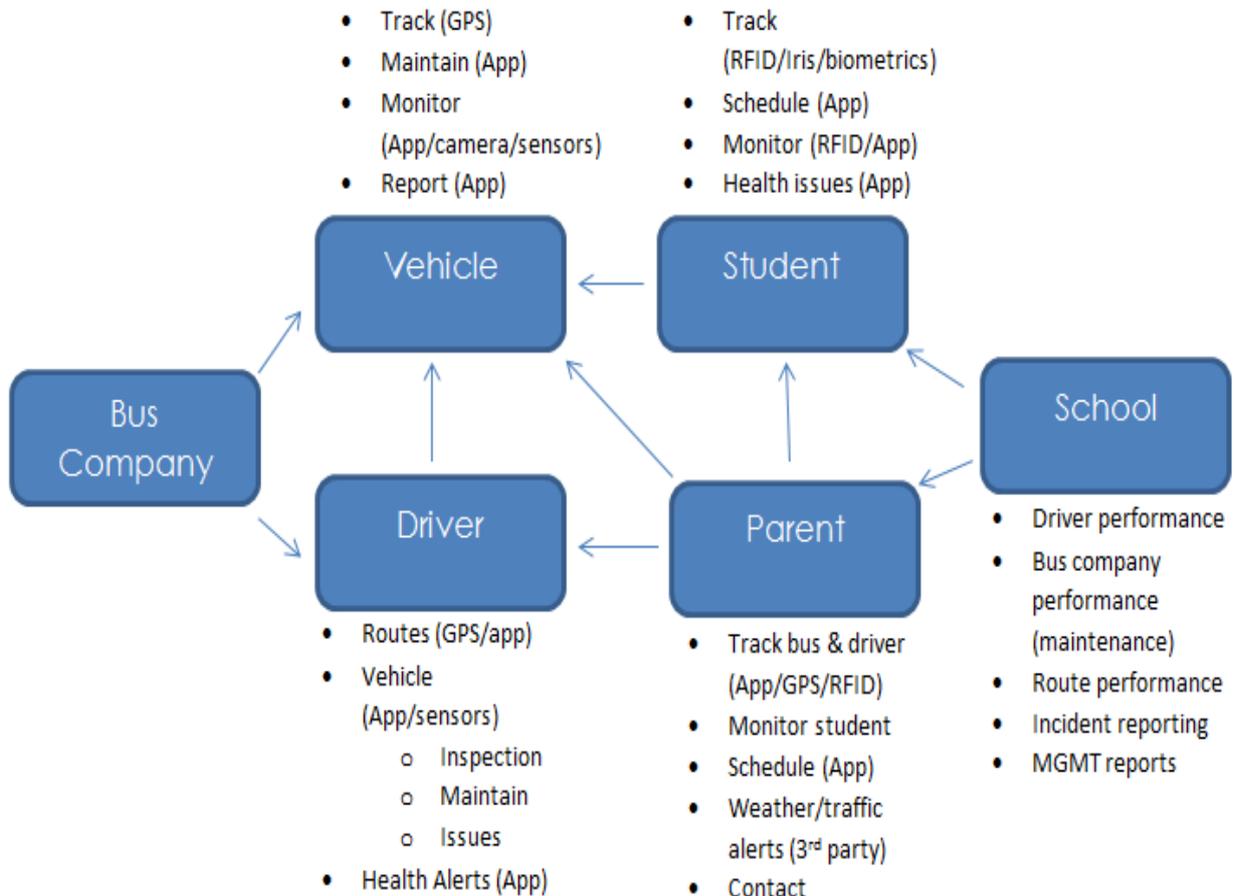


Fig-3: A roadmap of key developments in IoT research.

### Smart Vehicle Management [6]

The school vehicles can be tracked and managed effectively with the help of smart technologies. The following are the few aspects of smart vehicle management.

**Bus Attendance:** Each student's attendance is updated on a custom cloud application using data gathered from the RFID reader or iris scanner.

**SMS Alerts:** Automated pick up and arrival alerts are sent to parents via mobile.

**Route Adherence:** Get alerts when the bus driver goes off route to save fuel, time and ensure safety.

**Live Tracking:** View the bus travel live on the map, giving more insight to safety.

**Emergency Management:** In the case of emergency, select the bus route and the details of students such as blood group and contacts mailed to the hospital immediately.

**Voice Call:** The driver can make emergency voice calls to receive information from the school through hands-free communication.

**Driver Analysis:** Get automated reports about the driver's behavior and he/she will be rated accordingly based on timeliness, speed violation, and driving habits.

**Preventative Maintenance:** Sensors and Applications prevent mechanical failures by sending alerts when an inspection is due or if a problem arises.

**Downloadable Reports & Dashboards:** All reports including attendance, bus location, speed, history and other trends can be accessed anytime.

## **IoT Application Areas in Education**

IoT affects the education sector directly and indirectly.[7] Mainly it does the overall work ease and upgrades the quality of education. It affects the teaching and learning process broadly. The assessment area of education needs the real treatment and IoT is well suitable for the real implementation in this sector. Once the core areas such as teaching, learning, assessment are taken into consideration, the major aspect will be upgraded.

### **I. Better Learning Experience [8]**

The core functionality of IoT is a device to device communication. As digital learning involves a vast number of e-devices, the most of the time will be taken for the device management and decision making. As IoT is a right platform for this, it manages the way device interacts with other device and hence the better learning experience can be imparted to the learners.

### **II. Improved Operational Efficiency**

Educational institutions have a lot of participating stakeholders.[9] To get the desired outcome, one should keep track of students, staff, and resources. The operation of each device can be managed effectively, diligently through the implementation of IoT technology. The effective operational management leads to the success of the overall system. The system comprises of various components. The keen concentrated individualized management of each object leads to the overall growth of the progress of the system. Hence the IoT implementation will be a successful strategy in uplifting the effectiveness of the system.

### **III. Reduced Cost**

The major expenditure in an educational organization is the management of various units related to Institute. When IoT is implemented, the automatic communication that happens between the units will reflect the cost reduction. As minute observation will be done automatically this leads to the reduction of overall expenditure.

### **IV. Reliability**

Reliable systems will lead the greater outcome. The reliability of the entire system depends upon the individual components that are present in the system. As IoT leads the component management, it reflects the reliability.

### **V. Safety Considerations**

The overall safety of the institution can be tracked through the IoT system. Fire safety, prohibited entry, student's limited movements, external people entry and many more aspects can be easily tracked and an eye can be kept on these. As automatic communication happens between participating safeties devices it's easy to have specific surveillance in the campus. It also helps us to manage outdoor, out campus security through the specific wireless devices. The vehicles can be managed and the security can be provided.

## **CONCLUSION**

The next wave in the era of computing will be outside the territory of the traditional desktop. [10] In the Internet of Things (IoT) paradigm, many of the objects that surround us will be on the network in one form or another. The embedded devices with specific network technologies will meet the new challenges what educational institutions are facing. The grand growth in the IoT application devices availability and the smart devices with sensing and actuating capabilities will result in upgraded quality in service provision.

The objective of smart education is to improve learner's quality of lifelong learning. It focuses on contextual, personalized and seamless learning to promote learners' intelligence emerging and facilitating their problem-solving ability in smart environments. With the development of technologies and within a modern society, smart education will confront many challenges, such as pedagogical theory, educational technology leadership, teachers' learning leadership, educational structures and educational ideology.

Rapid and extensive technological development provides people to used BYOD scheme, and hence the data access and service provision in an educational institution are challenging as to implement IoT facilities.

**REFERENCES**

- [1]. Marge Kusmin, IFI8101 - Information Society Approaches and ICT Processes
- [2]. Cisco, The Internet of Everything: Fueling Educational Innovation
- [3]. IoT Applications, <https://x-systems.com/mobile-iot-security-solutions/education>
- [4]. Jayavardhana Gubbi, Rajkumar Buyya, and Internet of Things (IoT): A Vision, Architectural Elements, and Future Directions
- [5]. Understanding the Internet of Things (IoT), GSM Association, (2014)
- [6]. Kortuem, Gerd; Bandara, Arosha; Smith, Neil; Richards, Michael, and Petre, Marian (2013). Educating the Internet-of-Things generation. *Computer*, 46(2) pp. 53–61.
- [7]. The Internet of Things in Higher Education, (2016), [jenzabar.com/educause](http://jenzabar.com/educause), Volume 51, Number 4
- [8]. Samuel Dickerson, Internet of Things in Undergraduate Education, (2015), SSOE IotSeminar, Pittsburgh, PA
- [9]. Ovidiu Vermesan, Peter Friess, Internet of Things – From Research and Innovation to Market Development, (2014), River Publishers
- [10]. How the Internet of Things Is Transforming Education, Zebra Technologies