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 || PP.88-93

An IOT Based Secured Smart e-Campus

Shivaraj kumar T.H[1], Sriraksha T.A[2], Noor U saba[3]
[1]*PG StudentDept.CS & Engineering,.,C.B.I.T-Kolar.*
[2]*PG StudentDept.CS & Engineerin,.,C.B.I.T-Kolar.*
[3]*PG StudentDept.CS & Engineering,.,C.B.I.T-Kolar.*

ABSTRACT: *New technology like (IoT) in recent years rapidly developing in a computing world. The Internet of things will change the real world, activities and objects from simple to most complex. Beside areas as Business, Cities, Transportation, Healthcare, Agriculture and different areas, The IoT will also have a major implication in institute/college. In digital era our College campus need of IoT technology for classy environment to utilize secured & modern technology for e-campuses activities in academic course of action. In general, campuses spread over a fairly large area and it's very difficult to control for management to track everything happens.This project focuses on need of adopting IoT technology in campus using Secured for (e-Educational)-Campus academics. In near future drastically make changes for students in highly enabled IoT. Starting from needs and advantages ending with a possible architecture based on smart objects.*

Keywords:*Internet of things; Communication; Smart campus; Arduino, microcontroller;*

I. INTRODUCTION.

The Internet of Things (IoT) is a recent communication paradigm that envisions a near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol stacks that will make them able to communicate with one another and with the users, becoming an integral part of the Internet.[1] By working in this way access and communication with the different variety of gadgets and devices like camera, audio recorder, smart watches, Google glass, Digital broad displays, sensors …etc. the IoT will nurture the improvement of learning circumstance that make use of the huge subject data generated by those objects to provide dynamic services to teachers, learners and even to content developers in modern Campus. Smart e-campus enables us to use IoT methodologies to make it available for classroom notes everywhere inside network Area.[2][5]

II. SMART UNIVERSITY CONCEPT

In general context, the college are connected to Internet, and there similar objects that can be converted into smart objects within meaning of the IOT. for Eg: there are many common objects like computers, printer, projectors, books, poles, tables etc. there are complex objects such as building, labs, parking etc. All these objects can be converted into smart objects by adopting sensors. QR tags like (geographic, text, url) RFID and giving a significant level of intelligence to allow operation of actuators. And even decision making. All these components of development areas. Most we focused on human comfort in college and security and electricity saving in a labs, street light and tracking and smart inventory.[3] All these can also be applied in a campus.

Primary focus of smart e-campus is in the education area, but they also drive the change in other aspects such as management, safety, & environmental protection.[1] The availability of newer and newer technology reflects on how the relevant processes should be performed in the current fast changing digital era. This leads to the adoption of a variety of smart solutions in campus environments to enhance the quality of life and to improve the performances of both teachers and students Nevertheless, we argue that being smart is not enough for a modern e-campus. In fact, all college campus should become smarter in order to optimize learning. By "smart e-campus".

A. NEEDS & ADVANTAGES OF SMART e-CAMPUS.

Daily thousands of students, teachers and visitors are present in the campus, every time monitoring their details or reporting all irregularities observed, illegal parking, electric power management, unattended garbage, the tree fall, fire, raging, miss behaviour of students inside the campus etc, it's very difficult to put the man power for monitoring. In general, campuses spread over a fairly large area and it is very difficult for management to track everything that happens.[14]

The concept of smart e-campus is defined like a small world where sensor-enabled and network devices work continuously and collaboratively to make humans more comfort. The Internet of Things (IoT) will change everything, exercises and protests from easy to the most perplexing, and why not, even us people. Other than regions as business, transportation, vitality, medication, horticulture and others, the Internet of Things will

likewise have a noteworthy implication in education.[16] A college grounds may speak to the perfect spot for the formation of a keen domain. The point of the thusly venture is to depict another idea called Smart campus, beginning from requirements and focal points and closure with a conceivable design taking into account smart items. Some elements here are:

- ***SMART INVENTORY***: Each piece of equipment or component (cpu, printer, scanner, copier ETC) can have an associated bar code which represents inventory number and a QR tag. Using a device connected to the internet with a barcode reader this equipment can be identified with a barcode reader this equipment can be identified & it can be able to display all associated information.
- ***SMART PARKING:*** Monitoring of the university's parking and finding the number of vacancies since when staff/students are in traffic and avoiding jams or accidents in this ways;
- ***AUTOMATED STREET LIGHT:*** Automatically adjust the classroom light based on the data sent by an external sensor light about power of natural light, which wil reduce electricity consumption.
- ***GSM BASED ALRETS:*** We get alerts if any unauthorized persons enters the e-campus or in labs any security violations gets occurred.
- ***AIR QUALITY AND NOISE LEVEL, LIGHT INTENSITY MONITORING SYSTEM:***In cooperation with the e-campus Air Resources Division, campus members have established a sophisticated air quality monitoring station to characterize air quality in Shenandoah. Most monitoring efforts are done in conjunction with campuswide, interagency of networks.[19]
- ***GARBAGE & WASTE COLLECTION BINS OVERFLOW ALERT SYSTEM (GSM/ZIGBEE):*** In our e-campus many times we see that the garbage bins or dustbins placed at campus places are overflowing. It creates unhygienic conditions for people. Also it creates ugliness to that place. At the same time bad smell is also spread.
- ***CAMPUS GARDEN AUTOMATION WATER FLOW:*** The innovative campus GARDENA Water flow Meter allows targeted irrigation that is measured and mindful. At a glance based on moisture condition in soil. The consumed water quantity can be read at any time on the large display and thereby controlled. Until now, irrigation has been a matter of personal judgment and one's form on the day.

B. TYPE OF SENSER USED IN e-CAMPUS.

Sensors and technologies can be identified depending on their usefulness in e-campus, they can be used and after that split in the following and refer in fig[1].

- Temperature - Thermistors, thermocouples, RTD's, IC and many more.
- Pressure - Fibre optic, vacuum, elastic liquid based manometers, LVDT, electronic.
- Flow - Electromagnetic, differential pressure, positional displacement, thermal mass, etc.
- Level Sensors - Differential pressure, ultrasonic radio frequency, radar, thermal displacement, etc.
- Proximity and displacement - LVDT, photoelectric, capacitive, magnetic, ultrasonic.
- Biosensors - Electrochemical, surface Plasmon resonance, Light addressable potentio-metric.
- Image - Charge coupled devices, CMOS.
- Gas and Fire - Semiconductor, Infrared, Conductance, Electrochemical.
- Others - Moisture, humidity sensor, Speed sensor, mass, Tilt sensor, force, viscosity.

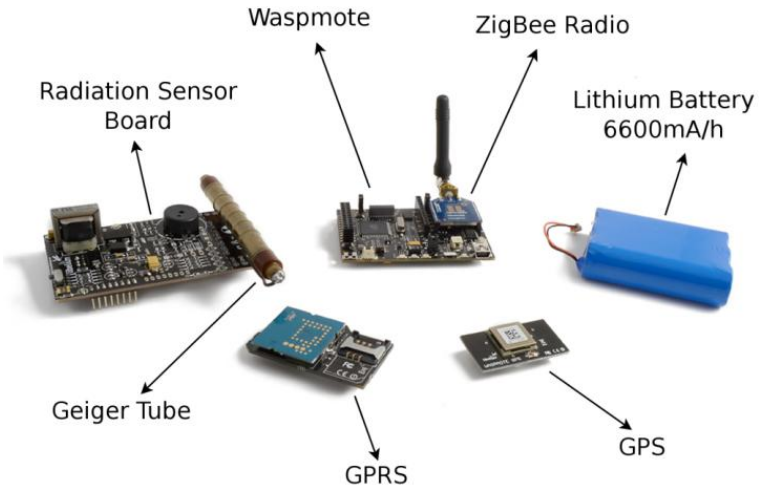

Fig 1: Collections of IoT some Sensors.

III. SHORT MODEL ALL SMART e-CAMPUS ARHITECTURE.

There may be many use case that can be described, from general & common one to other projects in IoT. To very specially case of secured smart e-campus.

A. SMART INVENTORY e-CAMPUS.

Each piece of equipment or component (cpu, printer, scanner, copier ETC) can have an associated bar code which represents inventory number and a QR tag. Using a device connected to the internet with a barcode reader this equipment can be identified with a barcode reader this equipment can be identified & it can be able to display all associated information. Things," in the IoT sense, can refer to a wide variety of devices such as heart monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, DNA analysis devices for environmental/food/pathogen monitoring or field operation devices that assist firefighters in search and rescue operations. Legal scholars suggest to look at "Things" as an "inextricable mixture of hardware, software, data and service". These devices collect useful data with the help of various existing technologies and then autonomously flow the data between other devices. Current market examples include home automation (also known as smart home devices) such as the control and automation of lighting, heating (like smart thermostat), ventilation, air conditioning (HVAC) systems that are printer,computers & other devices in lab's use Wi-Fi for remote monitoring. Has refer in fig[2].

Fig 2: Smart Inventory use in e-campus.

B. SMART PARKING IN e-CAMPUS.

Libelium announces the launch of its Smart Parkingsensor technology to be integrated in the Waspmote platform. The new Smart Parking sensor – part of Libelium's Smart e-campus solution – is designed to be buried in parking spaces and to detect the arrival and departure of vehicles. The Smart Parking platform will allow system integrators to offer comprehensive parking management solutions to city councils. By providing accurate information on available parking spaces, motorists save time and fuel and cities reduce atmospheric pollution and congestion.[12][13]

The quality of campus life across the world is negatively impacted by atmospheric pollution and congested roads. Road congestion results in lost time for motorists, wasted fuel and is a major cause of air pollution as shown in fig[3]. A significant contribution to congestion arises from motorists searching for available parking spaces - often requiring a considerable time before they are successful - and is a major cause of driver frustration. Providing accurate information to drivers on where to find available parking spaces helps traffic flow better and allows the deployment of applications to book parking spaces directly from the car.

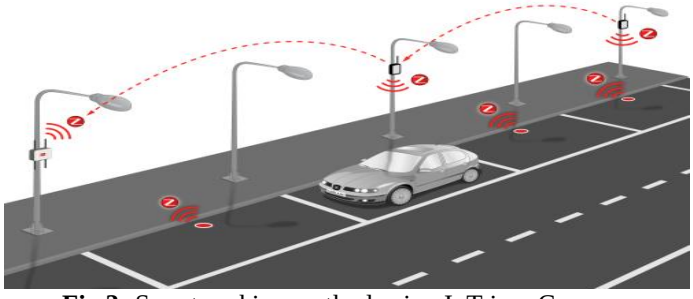

Fig 3: Smart parking method using IoT in e-Campus.

Systems based on Libelium's new Smart Parking sensor platform enable drivers to find free parking spaces quickly and efficiently. Efficient parking not only means happier motorists, but also reduces CO2 emissions, saves fuel and helps minimise traffic jams. Smart Parking sensors can be buried in parking spaces and communicate with the rest of the sensor network using Waspmote's ZigBee radio. The first deployment of the platform will be with SmartSantander – a unique city-scale experiment in applications of smart city technology which is already considered as a reference in the Smart Cities field.

C. AUTOMATTED STREET LIGHT IN e-CAMPUS.

Am looking forward to seeing how the smart lighting market develops in Ontario. I think it will be much faster than we think (and if we can get all these home automation systems, controls and wireless bulbs to speak the same language, startup MMB Networks may be able to help here!). LEDs are making great headway; sensors, controls, and connected bulbs are hitting the market; and there are a lot of IoT vendors that can add essential analytics and programmable intelligence layers.Provide better lighting in more places with easy, flexible installation that requires minimal training. Hosted software and a plug-and-play module get you up and running quickly. See operational status of your lights at a glance and deploy only where needed to reduce truck rolls. And with the VantagePoint software, asset management has never been easier. Plus you can proactively predict power outages and streetlight replacement needs for improved field efficiency.as shown in fig[4].Turn on, flash and dim lights to instantly assist citizens and first responders. Bottom line: A better experience and greater sense of security.

Fig 4: Smart Automatted lighting using IoT.

IV. A SHORT MODEL SECURED SMART e-CAMPUS.

The Internet of Things (IoT) is effectively used to sense its surrounding environments. Small microchips inside everydevice create a vast difference in its activity to sense, observe, react, record, Etc. Inter-connected enhanced device sharestheir data to another device. So Smart classroom consist of an enhanced device will collect data for e-CAMPUS. Instead of traditional classroom smart classroom with IOT device integrates e-learning system. Data sharing in the multiple way Machine to Machine and also M2 human possible, M to Mobile. "The IoT intelligently connectshumans, devices and systems, (Internet of Things in 2020, 2008). Analysts describe two distinct modes ofcommunicationin the IoT: thing to the person and thing-to-thing communication (Raunio, 2005)." IoT used in wide variety of application domain "The internet of things application domains are Medical technology, Retail, logistics and supply chain management, Transport, Insurance, Energy, Information security, Home automation,

Environment monitoring, Manufacturing, Agriculture, Education, Telecommunications" [02] "A recent research paper from IBM lays out the top five: Cost, Trust, Longevity, Utility, Making money – Brody predicts that it is only in 2016 or 2017 that we will see a flood of new devices that actually add value, and in sustainable ways." Among 5 parameters, utility play a major role in IoT to connect multiple machines for wide usage in various things and fields."IoT can enable interaction with physical spaces for learning purposes or communication."[04] Classroom physical spaces and college campus can use IoT technology to observe teaching activity and communicates to connected data recording device to share it in e-learning platform application as on fig[5].

Fig 5: IoT based smart e-campus.

So it will effectively transform the traditional classroom into a smart classroom then efficiently synchronize to e-campus. "The overall concept of IoT has several components, including the devices (or endpoints) that will be connected, the connectivity, the platforms to manage the endpoints andapplications, and the analytics capability required to manage the data and turn it into something meaningful for decisionmakers to act on or review." [05] Connected enhanced devices are endpoints inducted in sharing network with e-learning platform to communicate Machine to Man (human).

Smart classroom collected information, storing as digitalized data in a memory of e-campus platform. Learning approach can be chosen based on our curiosity way in which we are keen to learn. It creates impact on our memory while learning then recalling several. IOT technology helps on creating platform for fascinating learning by means of smart classroom surroundings & security for entre e-campus as shown in use case diagram fig[6].

Internet of things impact on education field and its institution will be drastically make changes in term of future upcoming college's campus infrastructures and the way of utilizing various iot things will be connected to educational and its physical environments.

As IoT & IoE placing more points for technology into daily day to day lives, it is obvious that learning and education will also cultivate to use those things to become more of a development for all of us. Rapid transformation of connecting things, Students will have to find for develops experts skills by frequently using technology and its shifts, especially education which have a long lasting major role to play in staying up to date. Every institution are looking further on to exploit the potential of IoT in the educational space by better providingIoT enabled campus infrastructures to keep on connected within the digital and bring in valuable outcome to the next generation.[11]

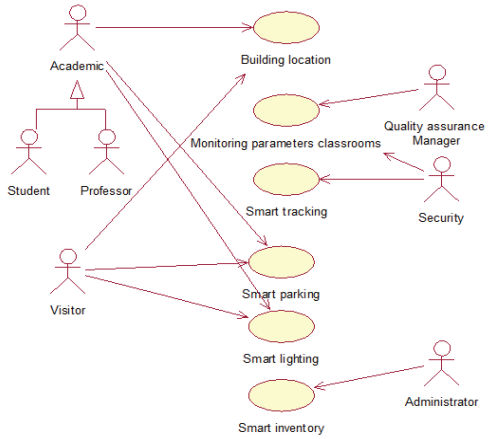

Fig 6: Usecase Diagram for secured Smart e-campus.

V. CONCLUSION

The smart e-campus is a more smart objects connected daily in the IoT. It is normal to grow new opportunities for transforming conventional systems in some smart e-campus. Obviously any campus cannot stand outside of this modern trend. If we want to create a more safe and efficient space all actors in this environment.This secured smart e-campus model can be reused in part of whole educational, security, safety, and other areas, like private environment can also use.

REFERENCES

[1]. L. Atzori, A. Iera, and G. Morabito, "The internet of things: A survey,"Comput. Netw, vol. 54, no. 15, pp. 2787–2805, 2010.
[2]. Dlodlo N, Foko T, Mvelase P, and Mathaba S "The State of Affairs in Internet of Things Research" The Electronic Journal Information Systems Evaluation Volume 15 Issue 3 2012, (244- 258), available online at www.ejise.com
[3]. "Five ways the internet of things is already broken—and how to fix it" by Leo Mirani September 23, 2014 retrieved from http://qz.com on 12 feb 2015.
[4]. "The State of Affairs in Internet of Things Research" by Nomusa Dlodlo, Thato Foko, Promise Mvelase, and Sizakele Mathaba CSIR Meraka Institute, Pretoria, South Africa in EJISE journal Volume 15 Issue 3.
[5]. "Investing in an Internet of Things (IoT) Solution: Asking the Right Questions to Minimize TCO" by IDC Custom Solutions and sponsored by Aeris Communications in January 2014 retrieved from www.idc.com
[6]. "The Internet of Everything: Fueling Educational Innovation - Learning@Cisco Overview" retrieved from http://globalstemalliance.org/media/filer_public/b9/c6/b9c609e0-deb9-479a-bc19-94770297fd3a/14cs4580- 2014 Cisco and/or its affiliates.
[7]. "Internet of things to power classroom education" by Cliff Saran Managing Editor published in 21 Aug 2013, retrieved from http://www.computerweekly.com/news/2240203884/Internet-of-thingsto- power-classroom-education

[8]. "Can the Internet of Things make education more student-focused?" by Max Meyers, Deloitte Consulting LLP retrieved from http://government- 2020.dupress.com/can-internet-things-make-education-student-focused/ on 10th Dec 2015.
[9]. "How IOT will transform the education?" by Sameer Bhatia retrieved form http://www.onlinecultus.com/how-will-iot-transform-the-education/ on 10th Dec 2015.
[10]. http://en.wikipedia.org/wiki/Classroom retirved on 20th Nov 2015.
[11]. Derzko, W.: Smart Technologies (2007). http://archives.ocediscovery.com/discovery2007 presentations/Session3WalterDrezkoFINAL.pdf
[12]. Fletcher, M.: Learning Disabilities: From Identification to Intervention, 324 p. The Guilford Press (2006)
[13]. Smith, C., Strick, L.: Learning Disabilities: A to Z: A Complete Guide to Learning Disabilitie from Preschool to Adulthood, 528 p. Free Press (2010)
[14]. Center for Parent Information and Resources. http://www.parentcenterhub.org
[15]. Bishop, D., Leonard,L.: Speech and Language Impairments in Children: Causes, Characteristics, Intervention and Outcome, 320 p. Psychology Press (2001)
[16]. Mason, H., Stone,J.: Visual Impairment: Access to Education for Children and Young People 495 p. David Fulton Publishers (1997)
[17]. The Free medical Dictionary. http://medical-dictionary.thefreedictionary.com/Visual +Impairment
[18]. Ling, D.: Speech and the Hearing-Impaired Child: Theory and Practice, 2nd edn, 402 p. Deaf and Hard of Hearing (2002)
[19]. National Center for Educational Statistics. http://nces.ed.gov/programs/coe/indicator_cgg.asp

Shivaraj kumar T His received the bachelor's degree in computer science from the Visvesvaraya Technological University, Belagavi. He is currently pursuing the master's degree in computer science, C.Byregowda Institute of Technology, Kolar, Karnataka, India. His current research interests are IoT, internet security, data mining, big data analytics, and cloud computing.

Sriraksha T.A,is received the bachelor's degree in computer science from the Visvesvaraya Technological University, Belagavi. He is currently pursuing the master's degree in computer science, C. Byregowda Institute of Technology, Kolar, Karnataka, India. His current research interests are IoT, internet security, big data analytics, and cloud computing.

Noor U sabha,is received the bachelor's degree in computer science from the Visvesvaraya Technological University, Belagavi. He is currently pursuing the master's degree in computer science, C.Byregowda Institute of Technology, Kolar, Karnataka, India. His current research data mining, big data analytics, and cloud computing.