ISSN : 2347 - 8446 (Online)
ISSN : 2347 - 9817 (Print)

Internet of Things Based Smart University Management System

[I]Renuka M N, [II]Anita R
[I]PG Student, [II]Associate Professor
[I, II]Dept. of CSE, The National Institute of Engineering, Mysuru, India

Abstract
In the event that the Internet has been a standout amongst the most vital human manifestations, the Internet of Things (IoT) will change everything, exercises and protests from easy to the most mind boggling, and why not, even us people. Other than zones as business, transportation, vitality, drug, farming and others, the Internet of Things will likewise have noteworthy ramifications in training. A college grounds may speak to the perfect spot for the formation of a brilliant domain. The point of the thusly paper is to portray another idea called Smart University, beginning from requirements and favorable circumstances and consummation with a conceivable design in view of brilliant articles.

Keywords
Internet of Things(IoT); Smart University.

I. Introduction

"Internet of Things" was originally visualized by British visionary, Kevin Ashton, in 1999. Normally, IoT is required to offer propelled network of gadgets, frameworks, and administrations that goes past machine-to-machine interchanges (M2M) and spreads an assortment of conventions, areas, and applications. The interconnection of these inserted gadgets (counting brilliant items), is relied upon to introduce robotization in about all fields, while likewise empowering propelled applications like a Smart Grid. The Internet of Things (IoT), which will make an enormous system of billions or trillions of "Things" speaking with each other, are confronting numerous specialized and application challenges. The IoT should have the capacity to fuse straightforwardly and consistently an expansive number of various and heterogeneous end frameworks, while giving open access to choose subsets of information for the improvement of a plenty of computerized administrations.

Internet of Things is characterized as "An open and far reaching system of canny items that have the ability to auto–organize, offer data, information and assets, responding and acting in face circumstances and changes in nature". Web of Things is one of the last advances in Information and Communication Technologies, giving worldwide availability and administration of sensors, gadgets, clients and data. Envisioning the Internet of Things (IoT) being utilized to track objects like a container of cola or a crate of grain from locales of generation to destinations of utilization is maybe not very hard to envision. In any case, there is a development under approach to include practically every comprehensible physical article into the Internet of Things.

Smart Things is another outlook change in IT world. Smart Things are the things that are having implanting quickness or insight, recognizable proof, mechanization, checking and controlling gauge. Smart Things are helping human life a ton, these days without their applications life is getting to be unwieldy. This paper shows deliberately on Internet, Things, and after that investigates on Internet of Things lastly Smart Things from scientists', and corporate point of view. Additionally, this article concentrates on the condition of Smart Things and its applications. This thus would help the new analysts, who need to do scrutinize in this IoT space.

II. Problem Statement

Internet of Things (IoT) is the system of physical articles gadgets, vehicles, structures and different things which are installed with hardware, programming, sensors, and system availability, which empowers these items to gather and trade information. In the event that the Internet has been a standout amongst the most vital human manifestations, the Internet of Things (IoT) will change everything, exercises and questions from easy to the most intricate, and why not, even us people. Other than territories as business, transportation, vitality, prescription, agribusiness and others, the Internet of Things will likewise have noteworthy ramifications in instruction. A college grounds may speak to the perfect spot for the formation of a brilliant situation.

There will be issues on solaces of human; there is issue in security and power investment funds in a smart building. The point of the thus paper is to portray another idea called Smart University, beginning from requirements and focal points and closure with a conceivable engineering in view of brilliant articles.

III. Proposed Solution

The concept of smart environment 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.

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 University, beginning from requirements and focal points and closure with a conceivable design taking into account smart items. Some elements here are:

- Monitoring the streams of individuals with the likelihood of opening or shutting pathways to hotspots on grounds.
- Traffic-stream by finding and showing the bearing of go to an area on grounds.
- Increase counteractive action of mischances.
- Reducing power utilizations.
- Creating a domain helpful for expanding socialization between all individuals from the college group.

© 2013, IJARCST All Rights Reserved

Fig 1: Categories of sensors and advances utilized as a part of smart university.

In the recent year's rapid development has been done in many fields, such as BIG data, Cloud computing, IOT and in the field of Electronics helps the Engineers to develop wireless sensor network with low power consumption for shorter distances and even to store the large sensor data. This proposed project mainly aims at transmitting the collected sensor data to build the smarter university

IV. Methodology

Smart Things are the things that are having embedding smartness or intelligence, identification, automation, monitoring and controlling caliber. Smart Things are assisting human life a lot, nowadays without their applications life is becoming cumbersome.
Daily, thousands of understudies, instructors and guests can be available into a university, each with no less than an article associated with the Internet, cell phone or tablet orientation. Since it is assessed that versatile web surfing to overwhelm desktop web surfing in 2015, on account of the IOT offices, straightforward arrangements in troublesome circumstances, for example, the quick distinguishing proof of an area inside grounds, can be shaped.
The idea of smart environment is characterized like a little world where sensor-empowered and arranged gadgets work continuously and cooperatively to make its occupants lives more agreeable.
As a general setting, all colleges are associated with Internet, and in each there are comparable items that can be changed over into shrewd articles inside the importance of the Internet of Things. For instance, there are straightforward regular articles like entryways, windows, printers, projectors, books, posts, seats and so on or complex questions, for example, structures, classrooms or lab, stopping and so forth. All these articles can be changed over into shrewd items by connecting sensors, QR tags (Text, links, geographic), RFID, NFC or BLE Beacons and by giving a critical level of knowledge to permit operation of actuators and even basic leadership. The arrangement of all these shrewd articles can change an established college, into Smart University

V. Framework Architecture

Framework engineering is the theoretical configuration that characterizes the structure and conduct of a framework. A design depiction is a formal portrayal of a framework, sorted out in a way that backings thinking about the basic properties of the framework. It characterizes the framework parts or building pieces and gives an arrangement, from which items can be secured, and frameworks built up, that will cooperate to execute the general framework. The System architecture is shown below.

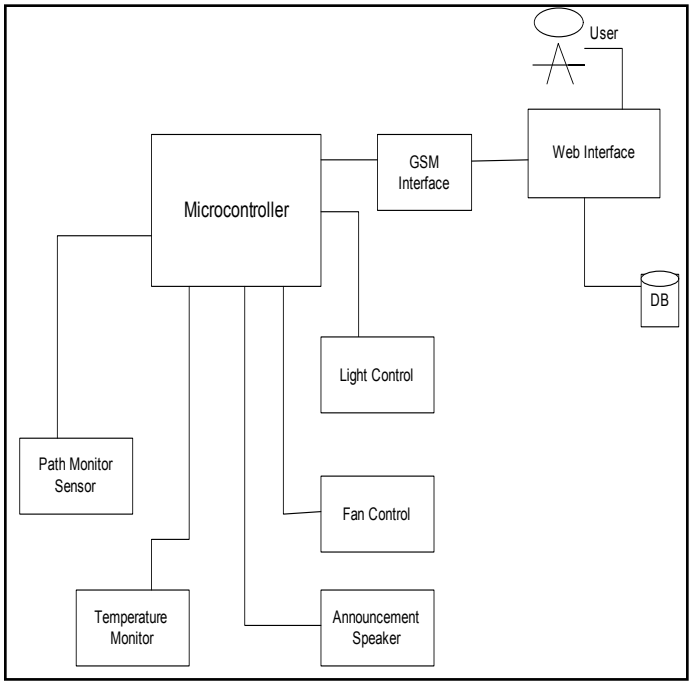

Fig 2: System Architecture

The modules are showed below:

Microcontroller

It is a highly integrated chip that contains all of the segments including a controller. Normally this incorporates a CPU, RAM, some type of ROM, I/O ports, and clocks.

Web interface

This module is utilized to give interface to the client to connect with framework. Web interface is created utilizing GUI segment. The client can likewise read the information which is put away in the information base. Web interface associated with GSM for recovering the sensor data.

GSM Interface

GSM stands for global system for mobile communication. It acts as interface between microcontroller of the system and web interface of the proposed system.

Path monitor sensor

These sensors are utilized to screen the way where in which gadget like fans, lights are controlled through computerized control framework. Every one of the gadgets is controlled through the small scale controller framework by utilizing web.

Temperature Monitor

It monitors the current temperature of the microcontroller used in the system.

Announcement Speaker

The admin can logged into the system through the web interface and play the announcement in the speakers. Admin also controls the light and fans by switching it on and off.
A use case outline is a sort of behavioral chart made from a Use-

© All Rights Reserved, IJARCST 2013

ISSN : 2347 - 8446 (Online)
ISSN : 2347 - 9817 (Print)

case analysis. Its motivation is to exhibit a graphical diagram of the usefulness gave by a framework as far as performing artists, their objectives (spoke to as use cases), and any conditions between those utilization cases.

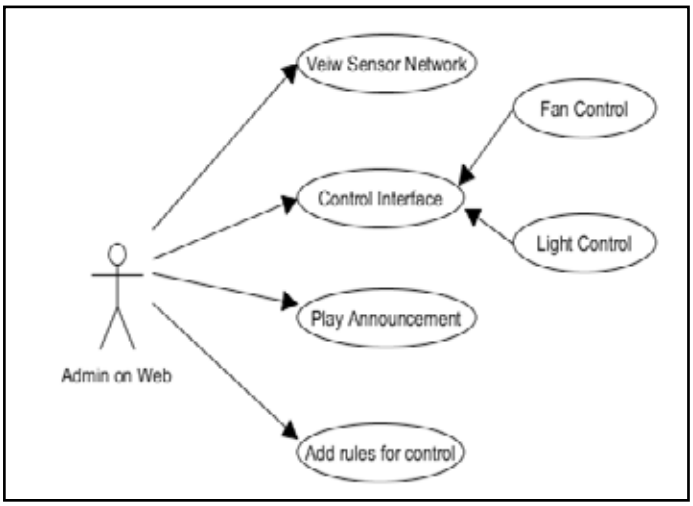

Fig 3: Use Case Diagram

The administrator is alluded as on-screen character who is performs different operations, for example, view sensor system, control interface, play declaration and include rules for control. Control interface are utilized to control both fan and light in the proposed framework.

A sequence outline in Unified Modeling Language (UML) is a sort of association graph that shows how forms work with each other and in what request. It is a build of a Message Sequence Chart. The sequence diagrams shows below:

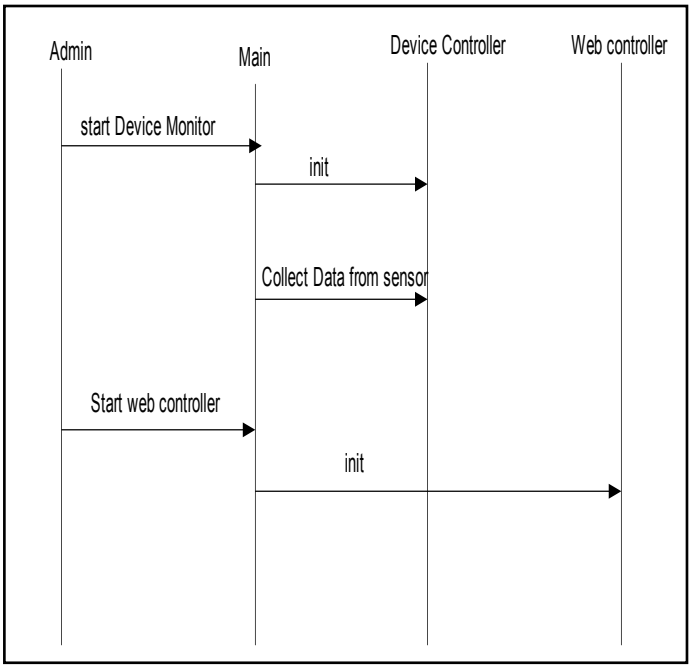

Fig 4: Sequence Diagram for startup flow

Here User, admin, main, device controller and web controller are objects. Each object interacts with other objects in a sequential order through messages.

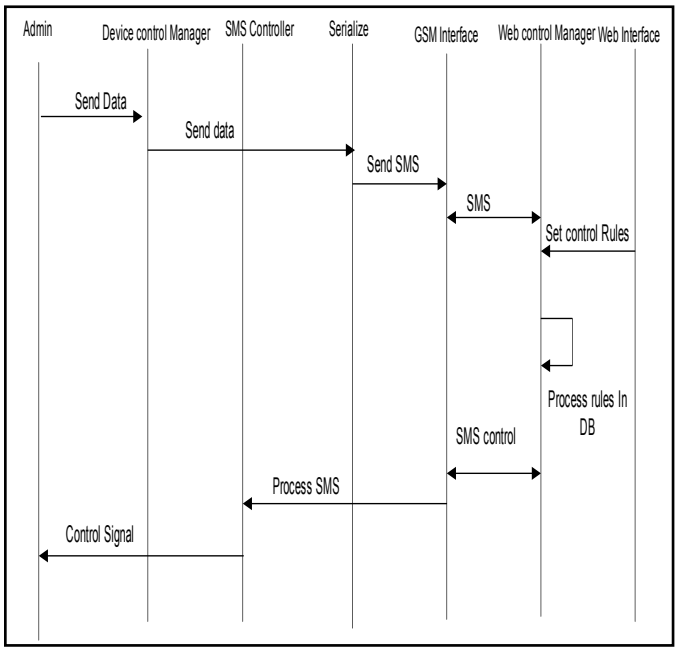

Fig 4: Sequence Diagram for Device Monitor flow

Here admin, device control manager, SMS controller, serialize, GSM interface, web control manager, web interface are objects. Each object interacts with other objects in a sequential order through messages.

VI. Implementation

Implementation is the phase of the venture where the hypothetical configuration is transformed into a working framework. At this stage the fundamental workload and the real effect on the current framework movements to the client division. In the event that the usage is not deliberately arranged and controlled, it can bring about bedlam and disarray.

This paper implementation purpose Java is chosen as the programming language. Few reasons for which Java is selected as a programming language can be outlined as follows:-

- Platform Independence
- Objects Orientation
- Rich Standard Library
- Applet Interface
- Familiar C++-like Syntax
- Garbage Collection
- Swing support

SVM Regression for Image Compression: Because of good generalization ability the SVM has been widely used. At first, it is designed to solve pattern recognition problem. Regression is an extension use of classification. It is a non-separable classification that each data point can be thought of being as its own class. In regression process, a set of training points are given, the real function is approximated with in a predefined error by choosing the minimum number of training points. There is a corresponding weight for each training point

Chosen by the SVM (support vector), number of Vectors and Weights is less than training points, which is that SVM regression can carry out data compression. The regression problem can be formulated as follows:

© 2013, IJARCST All Rights Reserved

$$f(x,w) = \sum_{i=1}^{N} w_i \varphi_i(x)$$

SVM attempts to learn the input - output relationship from the given training points (x1, y1), (x2, y2)…… (xl,yl) where xi R and yi R. In the case of regression, vapniks linear loss function is used with insensibility zones as a measure of the error between f(x) and y.

$$\text{Error} = |f(x,w) - y| = 0 \quad \text{if } |y - f(x,w)| \leq \varepsilon$$
$$= |y - f(x,w)| - \varepsilon \quad \text{if } |y - f(x,w)| > \varepsilon$$

VII. Performance Evaluation

Performance Evaluation manages a few sorts of testing, for example, unit testing which is a technique for testing the precise working of a specific module of the source code. It is additionally alluded to as module testing. It likewise gives a brief insight about various types of combination testing in which singular programming modules are joined and tried as a gathering. Other than these fundamental two sorts of testing, numerous different sorts, for example, approval testing, yield testing, client acknowledgment testing and planning of test information additionally examined here. This part additionally concentrates on guaranteeing nature of the product.

- Class tested to check whether all commands that were applied are working correctly and appropriately or not.
- Class tested to check whether all commands that were applied are working correctly and appropriately or not.

Working of Front-End: User interaction with help of I/O devices like mouse and keyboard. Appropriate forms open when buttons are clicked.

Working of Device Controller: User has to initialize the sensors and collect the data values from the sensor and send it to controller called arduino. Connections are done through serial connection, which can send using arduino controller.

Working of Web Control Manager: User has to initialize the manager and once data arrives rules are setted and controlled through this manager. Rules added and settled and report updated.

VIII. Conclusion

Smart object associated day by day in the IoT scene. Smart university model can be created in productive and more secure way. It is utilized as a part of different areas like instructive field. Furthermore in private segments it is valuable.

With more smart objects associated every day in the IoT scene, it is typical to develop new open doors for changing traditional frameworks in some smart. Obviously any college grounds can't remain outside of this present day pattern, on the off chance that we need to make a more protected and effective space for all on-screen characters in this environment.

The Smart University model can be reused to some extent or in general, additionally in alternate spaces, both in the instructive field (colleges, schools, schools, kindergartens) and in different territories, including private business environment.

References

[1] *Steffen sorrel, "the internet of things: consumer, industrial and public services".*
[2] *D J Cook and S K Das "Mobile, wireless and sensor networks"*
[3] *R Harvey "QR Codes initial Scoping Exercise"*
[4] *"The internet of things: AR, QR NFC and iBeacons for Ecommerce".{online}*
[5] *Xiao, M., Wu, J., & Huang, L. (2014). Community-aware opportunistic routing in mobile social networks. Computers, IEEE Transactions on, 63(7), 1682-1695.*
[6] *Madakam, S. (2015). Internet of Things: Smart Things. International Journal of Future Computer and Communication, 4(4), 250.*
[7] *Yu, L., Lu, Y., & Zhu, X. (2012). Smart hospital based on internet of things. Journal of Networks, 7(10), 1654-1661.*

© All Rights Reserved, IJARCST 2013