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Design and Development of Energy Saving Controller for Class room appliances using IOT

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Abstract - *This paper proposed to design and Development of Energy Saving Controller for Class room appliances using IOT .Using this system IOT in order to control class room appliances, thus automating modern class room through the internet. This system uses three loads to demonstrate as class room lighting and a fan. The class room automation technology is consistently improving its flexibility by incorporating the modernized features to satisfy the increasing demand of the people. . This system is cost effective but yet flexible, adaptable and secure Class room automation system.*

Keywords: Class room, Internet of things, *flexibility, cost effective.*

1. INTRODUCTION

IoT is a network in which all physical objects are connected to the internet through network devices or routers and exchange data. The IoT can change objects that are precisely unidentifiable into identifiable, recognized, interconnected intelligent objects based on the standard communication protocols, called Smart Objects. The IoT consists of a number of smart objects that are embedded with wired/wireless communication interfaces to communicate and interact with each other without human intervention .The basic concept of IoT is that various smart objects can be automatically linked into a network for interacting with humans through perception and networking technologies.

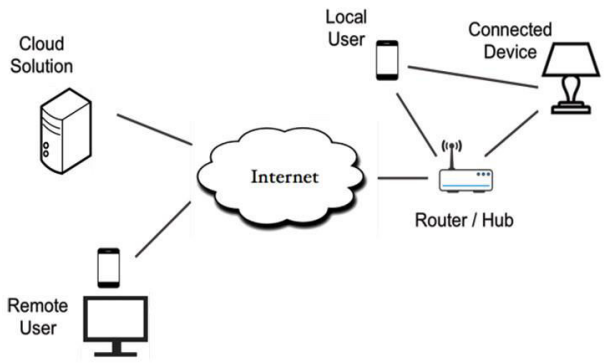

Fig 1.Components of IOT Application

2. OBJECTIVE

The main objective of this paper is to build a smart Class room device which can be used to control the class room appliances via internet. Class room automation provides you control of lighting, heating, ventilations, air conditioning appliances, roman blinds, curtains, security locks of doors and other systems by single touch on your smart phone. This design and implementing this system is cost effective but It provides flexible, adaptable and secure Class room automation system.

3. EXISTING SYSTEM

Developed an IoT based Smart Energy Management system where appliances like Fan and Bulb to start with are controlled wirelessly based on humidity and light intensity information. These inputs are used towards controlling the appliances intelligently rather than just switching on or off [2].

Developing an Automatic Lighting and Control System for Classroom [3] for the efficient use of energy. They have also provided mobility and remote command execution to system using Android mobile App via Bluetooth to control lighting based on voice command.

The earlier automation system has four main challenges; these are high value of possession, inflexibility, poor manage able ness, and issue in achieving security. Many people are always on the move from place to place due to business demands. Some people can spend a couple of days away from their home leaving all their household appliances without any kind of monitoring and control. Some devices are left plugged into power sockets whereas others are supposed to be plugged into and out of power sockets at different intervals depending on the time of the day. All this requires an individual to manually attend to each of the devices independently from time to time. All such monitoring and control can be done without necessarily being around or inside the class room. Some devices if not controlled properly consume a lot of energy which leads to extra expenditure on electricity.

4. DRAWBACKS OF THE EXISTING SYSTEM

- We should be physically at the place to on / off power supply.
- If we fail to off the power supply, unnecessary electricity loss will occur and there by our current consumption bill will increase.
- The product life will be shortened because of over running of the device.

5. PROPOSED WORK

In this paper propose to design an internet based class room automation system using IOT technology which will enable one to remotely manage electronic appliances from anywhere, anytime. Components required for implementing this system

- ESP-12 WiFi Module
- LM1117-3.3V
- Sugar Cube Relay – Qty.4
- Resistors 10K, 1K,4.7K
- Capacitor 1000uF, 10uF, 104 (0.1uF)
- Atmel Board
- 12V Power Supply

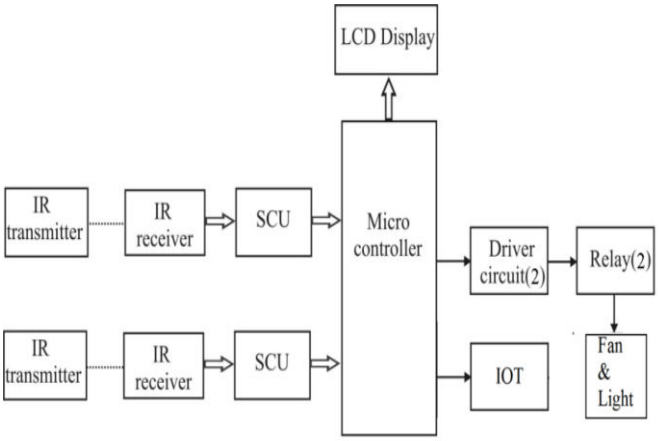

Fig 2: Block diagram

We have used IR sensor for detect the objects. Infrared transmitter is one type of LED which emits infrared rays generally called as IR Transmitter. Similarly IR Receiver (photo diode) is used to receive the IR rays transmitted by the IR transmitter. One important point is both IR transmitter and receiver should be placed straight line to each other.

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical.

Liquid Crystal Display (LCD)

Liquid crystal displays (LCD's) have materials, which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal.

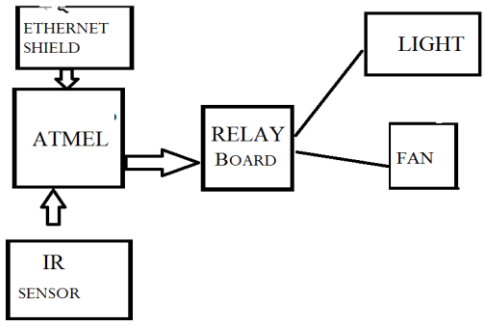

Fig 3.SystemArchitecture

This project was developed using PHP and MYSQL and it has two main modules such as Login and Data Log.

Login

In this module, when the new user will visit the system first they should give user name and password. Each and every time the user wants to access the system, they want to give their user name and password. If it corrects means the system will allow accessing it. Otherwise it will throw the error message.

Data Log

In this module, when the new user will visit the system they can view the detail of our class rooms tubes and fans how long time it was working. This data will get automatically stored in database.

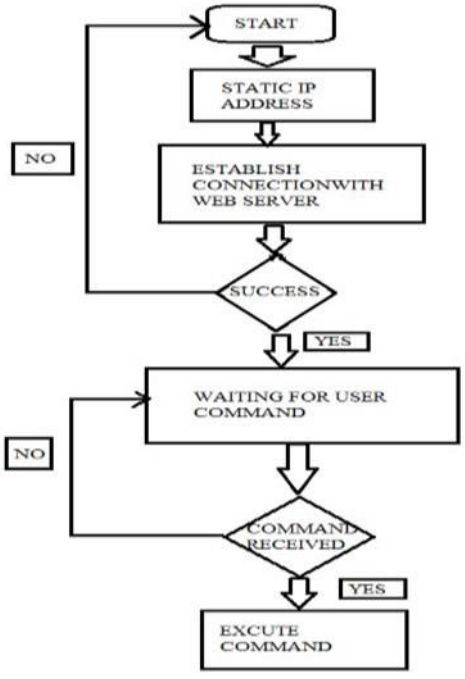

Fig 4.Control flow diagram

6. RESULTS

Using this system to control all electronic devices available in the class room and save the power energy. The results were represented in fig 5 and fig 6.

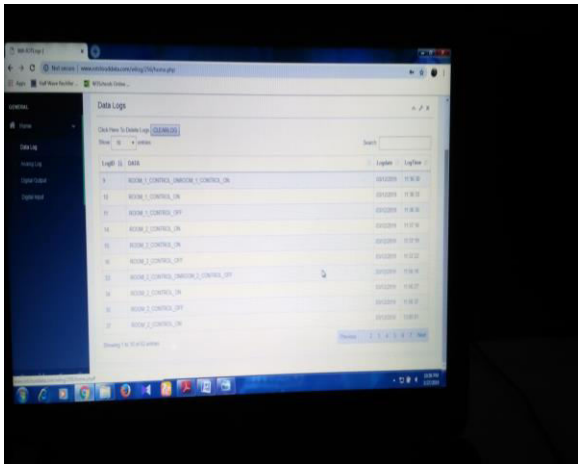

Fig 4.IOT Server Page

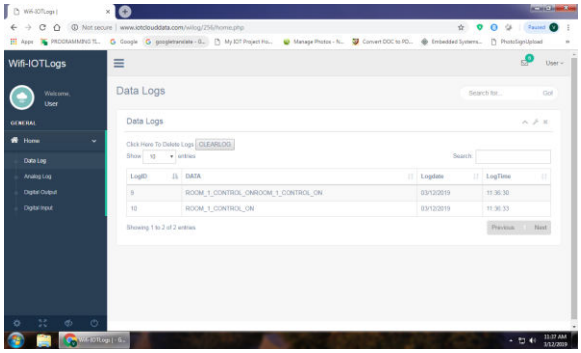

Fig 5.Data Log Page

Advantages of this system are Low cost. Low power consumption, Reliability, Easy to implement, Used to save the power.
Applications Used in auditoriums and theaters, Class rooms in schools and colleges, Used in offices and home.

7. CONCLUSION

This paper work proposed to remotely control class room devices through Internet of Things. From this system we can achieve using sensor automatic light and fan off in the classroom .it will save electricity. And the future of this project is very valuable. This application can also be extended to industrial automation applications.

8. References

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