"IOT based Smart Switchboard using Self-Designed Programmer Device"

Raashid Ansari[1], Manzil Baruah[2], Kamal Chauhan[3,] Hitesh Jethani[4], Sarika Kuhikar[5]

[1,2,3,4]*Student, Department of Electronics Engineering, Vivekanand Education Society Institute of Technology, Mumbai, Maharashtra, India*
[5]*Proffesor, Department of Electronics Engineering, Vivekanand Education Society Institute of Technology, Mumbai, Maharashtra, India*

---***---

Abstract - *Modern era can be compared to the smart era where everything is getting smart. Traditional devices are getting replaced by the smart devices. Similarly, old switch board needs to be replaced with such a device that uses the latest technology to do the same work but more efficiently, more quickly and we get motivated by this fact which has forced us to come up with a smart switch board. Now-a-days people look for things that are not only different but also efficient. So, considering the integration of smart grid technologies and to let people get accustomed to a bit of a different lifestyle, we have been motivated to develop smart switch board. The switchboard module fits behind the existing switchboard panel, without changing any electrical wiring or interior decor. Hence, it can be easily implemented to all houses. We have made a custom PCB which can be programmed by a programmable device for switches connected to different power appliances, sensors and motors. The previously happened research has been also included in it. Our aim is to provide a detail view of our system which is not just a proof of concept but a product.*

Key Words: **IoT, Programmers device, Smart Switchboard, Automation**

1. INTRODUCTION

The 'Thing' in IoT can be any device with any kind of built-in-sensors with the ability to collect and transfer data over a network without manual intervention. The embedded technology in the object helps them to interact with internal states and the external environment, which in turn helps in decisions making process. IOT Tutorial: What is IoT? In a nutshell, IoT is a concept that connects all the devices to the internet and let them communicate with each other over the internet. IoT is a giant network of connected devices – all of which gather and share data about how they are used and the environments in which they are operated. By doing so, each of your devices will be learning from the experience of other devices, as humans do. IoT is trying to expand the interdependence in human-i.e., interact, contribute and collaborate to things. I know this sounds a bit complicated, let's understand this with an example. A developer submits the application with a document containing the standards, logic, errors & exceptions handled by him to the tester. Again, if there are any issues Tester communicates it back to the Developer. It takes multiple iterations & in this manner a smart application is created. Similarly, a room temperature sensor gathers the data and send it across the network, which is then used by multiple device sensors to adjust their temperatures accordingly. For example, refrigerator's sensor can gather the data regarding the outside temperature and accordingly adjust the refrigerator's temperature. Similarly, your air conditioners can also adjust its temperature accordingly. This is how devices can interact, contribute & collaborate.

## 1.1 Proposed Home Automation System

The end individual can utilize their mobile phone or PC to sign into the machine. A fundamental test is accomplished for whether the equipment instrument is ON or not. handiest on the off chance that the equipment is approved and ON, at that point the individual is verified. when the confirmation is done accurately, individual is then equipped for send the control alarms to the equipment machine. at the equipment device the SL intention power program will always follow for the change inside the distinction and will thusly transport the markers to the Circuit. while a client chooses an exchange inside the notoriety for any of the instrument [I. e. ON or Off], the records from the hand-held is sent to the web Server in a string design, wherein the web – site is the host. At the server the status is spared in the database of their non-open device field at the equipment end, the circuit power program a web website page is utilized to rescue the notoriety of the contraptions in a reasonable example [for each 10sec]. those changes come quite close to treats [which are transitory web files] from the web server and are spared at the PC inside the name of the net site on the web. thusly every 10 sec on the grounds that the site page is revived and the new treat esteems are modernized.

1.2 Proposed Home Automation System Functions

The foreseen home automation structure can control the ongoing with activities in customer's home. It can likewise

---

control Lights on/off/diminish, Fan on/off, On/off various appliances, monitor room temperatures and humidity from anywhere within the WIFI range. Although you can control switchboard even if you are miles away from your home through the internet but that will require you to pay for cloud services additionally.

2. BLOCK DIAGRAM
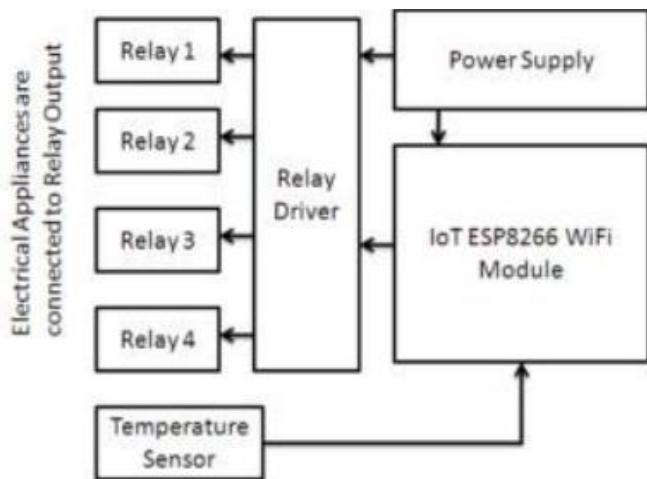
CUSTOM PCB DESIGN

Our Custom PCB has AC to DC converter which can supply 5V DC from 120V AC – 230V AC and has a power rating of 3 Watt. This makes it perfect for small projects that needs a 5-volt supply from mains. There are many advantages for these modules, such as low-temperature rise, low power, high efficiency, high reliability, high-security isolation etc. It also has esp8266 WIFI module to Connect over the internet to the website. It has 4 relays which is used to control switches electromagnetically using low voltages from microcontrollers. Each relay can be used for one switch. Hence, increasing the number of relays will increase the number of controlled switches.

WEBSITE
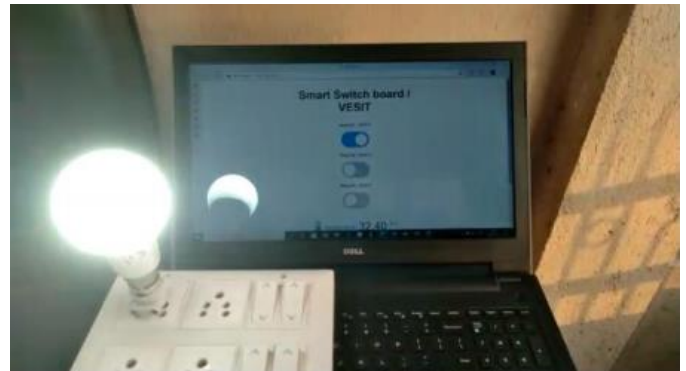
We have made a website to control the switches and display temperature of the room. Three appliances can be connected to this switchboard and a temperature sensor is also connected. At present we can operate the switchboard using this website from anywhere within the WIFI range but we can also use cloud services to operate it from anywhere in the world by a monthly subscription to their services.

3. RESULT

The whole project is aimed to introduce to a relatively new system equipped with latest technologies to overcome the limitations of traditional switch board. But in the way of coming up with this project, we faced several problems. Firstly, all the components we have used are not readily available in the local market as a result cost is increased. This cost can be reduced further if the components are manufactured and fabricated all together for industrially. Secondly, in the current sensor there is an offset voltage due to which a very small amount of current is always present even though in no load condition. Thirdly, we used test server for data storage which has limited capacity as well as limited security options. This problem can be solved by creating dedicated server and storing data in it. Initially, we have developed this board considering a single room. It can be further developed for broader areas such as a whole apartment or for several apartments. If the shortcomings are solved then smart switch board can be used industrially as well. At present, the whole device contains limited number of features but it can be further developed including features such as obstacle detection, automatic light on/off using motion sensor and so on. In short, smart switch board can be elevated further to turn it to such a device that can exhibit a lot of additional functions alongside the cost calculation and Wi-Fi control interface. Apart from all the features and future scope of smart switch meter, it has great significance as well. Due to this, people will be more conscious about their usage of electricity and will be able to predict and

plan their power consumption in daily/weekly and monthly basis. Also motive of the people will get changed as they will try to buy less energy consumed and eco-friendly products as home appliances. Usage of energy efficient devices will reduce the overall usage of electricity and hence power loss will be minimized. Lastly, it can be said that smart switch board is not just a device with some fancy features but also a device that can perform according to the need of its user.

4. CONCLUSION

While wearing down this endeavour we have grabbed a lot of finding out about various modules being used in this errand. We are glad we can participate as a gathering in this endeavour and set up new musings. We believe the assignment completes as needed and the data grabbed in the midst of this period will be used in our future corporate life. Additionally, we might want to include that home computerization is the fate of places of new world.

REFERENCES

[1]   S. Das and D. J. Cook, Smart Home Environments: A Paradigm Based on Learning and Prediction, Wireless Mobile and Sensor Networks, Wiley, 2004.

[2]   "Best Home Automation System - Consumer Reports". www.consumerreports.org. Recovered 2016-02-14.

[3]   https://arduino-info.wikispaces.com/BlueTooth-HC05-HC06-Modules-How-To.html

[4]   https://en.m.wikipedia.org/wiki/Arduino.html

[5]   "D. J. Cook and M. Youngblood, Smart Homes, Encyclopaedia of Human-Computer Interaction", 2004. • S. Praveen "IOT and its Significance ", 2015, Online.

[6]   S. Prasad, P. Mahalakshmi "Shrewd Surveillance Monitoring System Using Arduino and PIR sensor, International Journal of Computer Science and Information Technologies, pp 45-65, Vol. 5, issue 1,2014.

[7]   Pyarie R. Tyarize,"Bluetooth based home computerization framework utilizing IOT", International Journal of Computer Science and Information Technologies, pp 103-130, Vol 2, issue1,2013.