



KUMARAGURU COLLEGE OF TECHNOLOGY
COIMBATORE-641049



(An Autonomous Institution Affiliated to Anna University)

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING**

U18INI5600 - ENGINEERING CILINCS – V

Project Report

**IOT Based Home Automation Using Google
Firebase**

Submitted by

Gopinathan(18BEC111),

Kavin prabhu(18BEC120),

Madhankumar(18BEC168),

Sellakumar(18BEC114),

Soundarrakumar(18BEC180)

Faculty Coordinator

Dr.S.Sasikala

ASP/ECE

IOT Based Home Automation Using Google Firebase

Abstract - In this modern era of emerging technologies, inventions and innovative technologies that makes human life comfort is considered to be present. technologies along with internet is makes us more luxury. Automation is anything that reduces human work and makes life easier and accessible . Home automation is nothing but controlling home appliances with smart phones, tablets , etc.,. without usual methods. It provides facilities such as controlling devices when we are far from home, and automatic on/off of devices , etc.,. Home automation is the one which is highly preferred by people who leaves home frequently and who loves to take care of home. Internet of things(IOT) is the current trending as well as evolving technology where internet and basic things are embedded. Home automation using iot is more effective than other smart homes. In this paper, we have developed a wireless home automation using a google cloud platform called firebase and an android application which serves as the control from the user. Nodemcu acts as heart of the project from which several home appliances are connected through relay. Several other sensors are used to detect real time environmental parameters according to which devices can act.

Keywords – automation , accessible , IOT , embedded , wireless , firebase , application , sensors

I. INTRODUCTION:

IoT's describe the impression of connecting and breaking down realworld occasions utilizing the Internet. The idea can be actualized in our home to make a brilliant, protected and mechanized climate. Home automation is low costs and secure your protection. this innovation is to mechanize the machine around us which empowers us to control

them and helps in notice us during important time. All the home things are controlled by using mobilephone. Home automation is used for control and monitor home appliance. Home Automation empowers you to utilize your home's lighting, warming and machines all the more helpfully and proficit. It is a basic as distant or programmed control of a lights, or it very well may be a finished framework that controls all significant pieces of your home. home automation is the capacity to do undertakings naturally and screen or change status distantly. The reason for this mechanization is to checking and controlling electrical gadgets in home distantly utilizing Wi-Fi and get the status alert through SMS by utilizing GSM modem at whatever point Required. The GSM modem gives the correspondence component between the client and the microcontroller framework by methods for SMS. Home automation is used for control home appliance in everywhere in the world. It is very useful for physical challenged people and old people. home automation make life more convenient and save our money by wasting electricity. this process of automatically performing everyday functions at home to save you time, energy, money and at the same time offering improved security.

II. HARDWARE REQUIRED:

- nodeMCU
- relay module
- diode
- sensors

III . METHODOLOGY

The Smart Home Automation System is an integrated framework to facilitate people with an easy to use home automation system that can be fully operated based on voicespeech commands. The system is constructed in a way that it is easy to install, configure, run and maintain by any type of people. In this project the ESP8266 is used as the controller as it is cost effective one in the market and it translates the command sent by the user into the necessary actions through the relays. The controller connects with the sensors which reads the sensor data and sends it to the cloud where the user have a look at it. The whole home automation system connects to the internet using wifi through the Router. To provide a GUI(Graphical User Interface)to the user the MIT app inventor can be used for controlling monitoring the home automation system which is very easy for the user to control and monitor the system. The google firebase is the one which is used for fast and secure hosting of the app and it works like a database for storing and analysing the data sent from the controller. The combination of the Node MCU, Firebase, MIT app inventor, Relays and sensors makes the home automation system a cost effective, efficient and user friendly experience.



IV. WORKING:

Coding

Coding of this project can be done in arduino as well as java script as firebase supports c++, java , java script. after programming, code is uploaded to firebase.

Controlling through app:

The NodeMCU will connect to the WiFi Network after the code is uploaded. The Android app and

There are lot of methods and processes to design a home automation , using of android application is one among them. for easy understanding , Functioning of the automation is parted into different ways.

- Creating android application
- Setting up google firebase
- Coding
- Controlling through app

Android application:

The main part of designing this is creating an android application for easy controlling of appliances simply through touching the desired key in the app. Simplest way to design a app is using MIT app inventor - app inventor for android. it is web application produced by google where anyone can design their own application in a desired manner for several purposes. As it is user friendly everyone can try this for designing. from this , an app is created with four pairs of ON/OFF touch keys which can be used for controlling respective appliances

Setting up google firebase:

Google firebase is web based platform like google cloud used for computing and analysing programs and applications. It is a cloud hosted database where real time data and informations are stored and modified and can be connected to devices through online. Setting up the Google Firebase Console Database is now the only thing we need to do. We can then send real-time data from the Android application to Google Firebase once the setup is completed. Firebase host and authentication token are two main components used for setting up firebase. host provides fast and secure hosting of web app and token is used for checking and authenticating purpose. After setting installation of two libraries is made. JSON(java script object notation) is open file standard library which is easy to read and write. google firebase library is the second one.

Nodemcu board link to Google Firebase using the Firebase Authentication Token & Host. Now the ON/OFF command in app can be used to control the appliances. on any command is selected, the instruction is passed to firebase and the respective HIGH or LOW command gets executed in nodemcu and the corresponding relay module gets activated to HIGH or LOW and based on that the appliances will get turned ON or OFF.

V. FUTURE SCOPE:

Future scope for home automation systems controlling various devices with this automation. In future it is useful for physically disabled and old aged people. In the modern world useful for everyone. Home automation offers a global standard for interoperable products. Home automation exactly describes homes in which nearly everything like lights, heating and cooling system are hooked up to remote controlled system or smart device. All of these used to work together to make your home comfortable, efficient and secure. Not only used in home automation and also used in sensors (light sensor, temperature sensor) electrical applications. It is safe and secure. Home automation systems involves making homes even smarter. Homes can be interfaced with sensors including motion sensor, light sensor and temperature sensor and provide automated toggling of devices based on conditions.

VI. CONCLUSION:

This project presented a low cost and monitoring home using Node MCU Board with internet and various sensors and components that can be remotely controlled by Smart phone (Android & OS) and can be used to control the Home appliances. In this Project the Node MCU is used as an interface between the user and the hardware components. It is programmed and connected to several components according to the requirements. A Google firebase is used as an application layer for communication between remote users and home devices, security systems. Internet is the most

common thing in this project, it connects the user and the firebase. The main objective of this project is to provide a easy and low cost way to control home appliances by using the MIT app inverter. It save energy as well as time. In the help of this project we are control all the home appliances through the IOT.

VII. REFERENCE:

- [1] Vishwateja Mudiam Reddy, Naresh Vinay, Tapan Pokharna and Shashank Shiva Kumar Jha, Internet of Things Enabled Smart Switch, Thirteenth International Conference on Wireless and Optical Communications Networks (WOCN), Hyderabad, (2016), 1-4.
- [2] Shih-Pang Tseng, Bo Rong Li, Jun-Long Pan, and Chia Ju Lin, An Application of Internet of Things with Motion Sensing on Smart House, International Conference on Orange Technologies, Xian, (2014), 65-68.
- [3] Ian G smith, "The Internet of things" New Horizons, IERC-Internet of things European Research cluster, 2012.
- [4] Vikram.N, Harish.k, Nihaal.M, Raksha umesh, "A Low Cost Home Automation System Using Wi-Fi Based Wireless Sensor Network Incorporating Internet of Things (IoT)", IEEE 7th International Advance Computing Conference, pp. 174-178, 2017.
- [5] Zeinab Kamal Aldein Mohammed, Elmustafa Sayed Ali Ahmed, "Internet of Things Applications, Challenges and Related Future Technologies", pp. 126-148, 2017.