

COST EFFICIENT FIVE WAY HOME AUTOMATION WITH FEEDBACK SYSTEM

V. Vinay Varma¹, T. Jagadeesh², N. Divya Deepika³, N. Sahithi⁴

Dr. M. Murali⁵, Mr. R. Lakshmana Rao⁶

^{1,2}Student Department of Electronics and Communication Engineering

^{3,4}Student Department of Computer Science Engineering

⁵Professor Department of Electronics and Communication Engineering

⁶Assistant Professor Department of Computer Science Engineering

^{1,2,3,4,5,6}*Centurion University of Technology and Management, Vizianagaram, India.*

ABSTRACT – This paper presents the concept of home automation with feedback system using Google assistant, IR remote, Blynk app, Alexa and Manual switches. Automating of any thing has a very large scope for the coming generation and now. These days, technology follows the user wherever they go, and the automation industry is greatly influenced by mobile technology. This work is primarily based on low-cost, effective home automation systems for mobile Android device remote control of appliances with this technology, we can create a smart house at a minimal cost while also raising the standard of living there and saving time and human effort. And also, the concept of smart home is very helpful for providing support to physically disabled people to fulfil their needs in home so they can lead a life like a normal person. This system's components include an Android phone, an ESP32 controller controlled by the Blynk app, an IR remote, manual relay controls, Google Assistant, Alexa, and a real-time feedback system Wi-Fi is being used in this case to monitor the home automation system because of it has high precision, long range and immediate connectivity. This automation module is very simple to install and easy to use, and it regulates the home appliances.

Keywords – ESP32 board, IR remote, Relay module, Google assistant, Alexa, Realtime feedback.

1.INTRODUCTION

Because of its safety and security, home automation has grown more advantageous. Home automation has advanced and is now more accurate at monitoring all household appliances. Home automation technology have advanced into incredibly user-friendly and energy-efficient smart home innovations. It has fundamental features to preserve user comfort and happiness. Home automation is a special system that can manage and communicate with almost every component of your home. The term "home automation" refers to the synchronisation of all domestic amenities and equipment. For instance, a centrally located microcontroller panel may be able to operate all electrical appliances and heating systems. Home automation includes setting up electronic gadgets to respond to certain conditions and allowing us to operate certain features of our home remotely using a computer or other mobile device. The many controllable appliances must be linked and in communication with one another. The primary function of home automation is to regulate or keep an eye on signals coming from various appliances or essential services. The home automation system may be controlled and viewed on a smartphone.

2.IMPLEMENTATION

(a) PROPOSED SYSTEM:

This IoT project will create an easy-to-use ESP32 smart home automation system that uses an IR remote, Google assistant, Alexa, Bluetooth and Blynk to control 8 relays both online and offline. With the help of this ESP32 project, eight home appliances may be operated by a smartphone, IR remote, or manual switches. Also, without internet access, the relay module can be operated via IR remotes and manual switches.

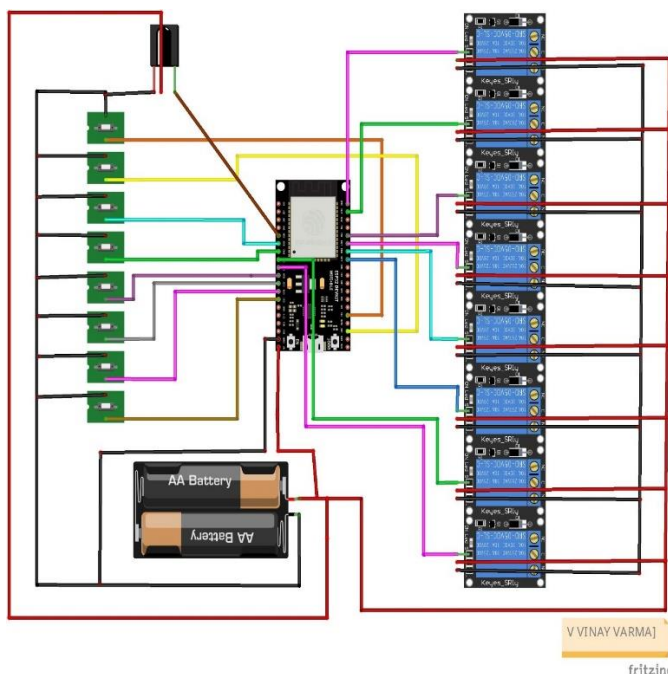
(b) PROPOSED SYSTEM COMPONENTS:

For this project required components are

- ESP32 DEV KIT
- 8-channel relay module
- IR receiver
- Switch board
- Bluetooth Module
- IR remote

2.1 CIRCUIT DIAGRAM:

Circuit of home automation using ESP32:



The circuit is very simple. The 8relay module will have a ground pin, vcc pin and 8 input pins to take input from the esp32. Connect all the 8 input pins of relay module to any 8 digital GPIO pins of esp32. Connect the output pin of TSOP receiver with a digital pin of esp32. According to the code, the control pins of the 8-relay module will turn on when receive low signal and the relay will turn

off for high signal. 5v amp battery is used power the circuit. Connect all the ground pins and vcc pins of esp32, switches and relay module to the ground pin and vcc pin of battery. After the connections are done upload the code in to the esp32.

ESP32 home automation using Blynk app. Here we will select WI-FI for the connection then click create option. Then add buttons in blynk iot app we will control the appliances with these buttons. To control the 8-relay module, we should add nine buttons in the blynk iot app.

STEPS TO SET UP BLYNK APP:

- Open the blynk iot app then open project.
- Then tap on the button and then tap on output pin set it to Vn, here n is the number you can give any number and set the mode to switch. To turn the relay ON module it has to be 0 and 1 to turn the relay module OFF.
- In the same way we have to create 8 buttons with v1 to v8 pins to control the relay module.
- For last button select the pin v9 & set the mode to PUSH. It will help the button to turn off all the relays at once when pushed.

STEPS TO SET UP BLUETOOTH:

- We all know esp32 will have inbuilt Wi-Fi and Bluetooth modules in it.
- We created a blue tooth app to control the devices and we can control the devices after uploading the source code.

STEPS TO SET UP GOOGLE ASSISTANCE:

- Open ifttt in web browser.
- Select applet > trigger.
- In action give the command i.e., turn on switch one then, click on done.
- Then select action> webhooks.
- In webhooks give URL of your project in blynk app and change v values from 0 or 1 to on and off the switches.
- Do this to all 8 buttons.

STEPS TO SET UP ALEXA:

- Create account in sinric pro and create the devices which you want to control.
- We will get some unique ID for each copy and paste them in the code.
- After uploading the code to esp32 search for sinric pro in alexa app and connect to it.

TO PROGRAM ESP32 WITH ARDUINO IDE:

- Go to the preferences > additional boards manager urls:
- http://arduino.esp8266.com/stable/package_esp8266com_index.json
- Then install the ESP32 board.

HEX CODE GENERATION:

Buttons of IR remote will have hex codes. These hex codes will differ from button to button. In order to control home appliances through IR remote we should know those hex codes. To get these hex codes we will use IR receiver connected to esp32. Upload a code to esp32 to get hex codes of IR remote from IR receiver. Code will be available in google. After uploading the code, the IR receiver will detect the hex codes from buttons when pressed and those hex codes will be displayed in serial monitor.

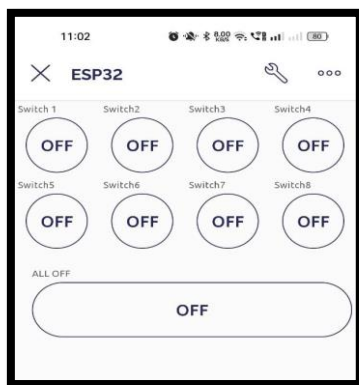


Fig.1 Blynk app

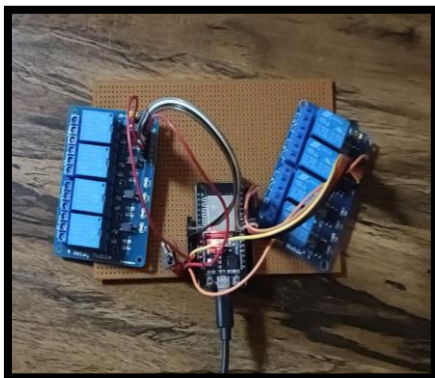


Fig.2 Home Automation device

CODE MODIFICATION:

- Update the source code with the hex codes.
- Mention the Wi-Fi name and Wi-Fi password in the source code and upload it to esp32.

RESULTS:

We can control the relay modules and monitor through blynk app if and only if Wi-Fi is connected to esp32. We can turn on the home appliances and also off them.

We can also control the relay module by voice commands with the help of google assistant if WIFI is connected.

If WIFI is not available we can monitor the 8-relay module with IR remote, Bluetooth and also switches manually.

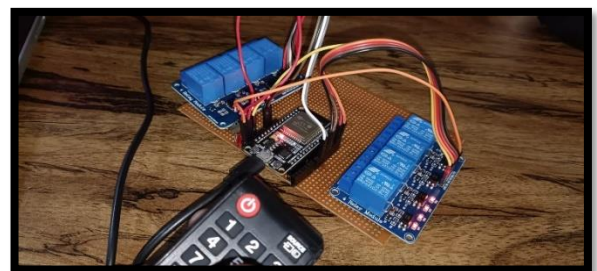


Fig.3 Home Automation device

CONCLUSION:

In this paper, a smart home system is proposed and implemented. This home automation using iot is easy to use. Due to the automated monitoring systems that are installed in your home and allow you to utilise technology effectively, you can save more money on your electricity and utility bills. Home automation makes life simpler. Also, objects can be paired with virtual assistants like Siri and Alexa. You don't even need to have your phone ready as long as your smart home hub is functional. Simply shout the order.

REFERENCES:

[1] Mamta, A. Paul and R. Tiwari, "Smart Home Automation System Based on IoT using Chip Microcontroller," 2022 9th International Conference on Computing for Sustainable Global Development (INDIACom), 2022, pp. 564-568, doi: 10.23919/INDIACom54597.2022.9763287.

[2] Babiuch, Marek & Postulka, Jiri. (2020). Smart Home Monitoring System Using ESP32 Microcontrollers. 10.5772/intechopen.94589.

[3] Jampana, J. Gowthami and Praneeth, A. Jubilee and Devi, J. Harshita and Rani, P.Sobha, Smart Home Automation System with Status Feedback Based on Esp32 and Iot (April 9, 2022).

[4] Mahamud, Md. Sadad & Zishan, Md. (2019). Domicile - An IoT Based Smart Home Automation System. 10.1109/ICREST.2019.8644349.