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IoT Based Home Automation System

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Abstract: *Wireless Home Automation system (HAS) using IoT is a system that uses computers or mobile devices to control basic home functions and features automatically through internet from anywhere around the world, an automated home is sometimes called a smart home. It is meant to save the electric power and human energy. The home automation system differs from other system by allowing the user to operate the system from anywhere around the world through internet connection. It requires a NodeMCU board, Relays, Blynk Application, Web-Hook, and IFTT. In this paper we present a Home Automation system (HAS) using Blynk Community.*

Keywords: Home Automation, Relay, Controlling, IoT, Blynk, Internet, GSM.

I. INTRODUCTION

IOT or internet of things is an upcoming technology that allows us to control hardware devices through the internet. Here we propose to use IOT in order to control home appliances, thus automating modern homes through the internet. This system uses 4-loads to demonstrate as house Appliances Controlling. Our user friendly interface allows a user to easily control these home appliances through the internet Worldwide. For this system we use a NodeMCU (Node Microcontroller Unit). This microcontroller is interfaced with a Relay modem to get user commands over the internet. Relays are used to switch loads. The entire system is powered by a 5V Adaptor/Charger (Microtype). After receiving user commands over the internet, NodeMCU processes these instructions to operate these loads accordingly and display the system status on a Smart Phone Display. Thus this system allows for efficient home automation over the internet. In this we have used the Blynk Community Application for controlling the Home Appliance all over the world. The Method used for controlling are Swiping the figures on Smartphone or Voice Control with Google assistant and After that we have used the latest technique that is IFTTT Platform & Web-Hooks For triggering our circuits. It will trigger the circuit as it gets input command from the Google assistant.

II. LITERATURE SURVEY

A. Home Automation System Using Bluetooth & Smart Phones:

In this technique the Home appliances are connected and controlled using Arduino Boards and Bluetooth Model. For its operation a Bluetooth control application is needed to download and install it in user Smartphone. This technique is simple and can be hacked easily. And it have limitation that it can be used up to 10 meters only. The program of Arduino BT board is based on high level interactive C language of microcontrollers; the connection is made via Bluetooth. The Bluetooth connection is established between Arduino BT board and phone for wireless communication.

B. Wireless Home Automation System Using IoT

This system uses mobiles or computers to control basic home control and function automatically through internet from anywhere around the world globally, an automated home is sometimes called a smart home. The proposed system is a distributed home automation system, consists of server i.e. NodeMCU Esp-8266 Wi-Fi module, sensors, Relays. The Blynk Server controls and monitors the various sensors, and can be easily configured. It can be handle 14 Loads, it can be a sensor as input or can be a relay which will act as output. The NodeMCU board, with built in Wi-Fi module acts as web server. Automation System can be accessed from the using Blynk which is available on play store, Mobile is used to control device connected to the internet with appropriate Blynk Community App, Blynk Server.

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III. METHODOLOGY

Make Connection As Per Circuit Diagram, Make Connection On NodeMCU. And Then Connect NodeMCU to the Wifi using hotspot/Router. Then Connect the NodeMCU pins Output to the Relay Driver Circuit Then Start Programming the NodeMCU Module. Programme The NodeMCU Using Aurdino IDE Software. Download the Blynk Liberary zip File, Install it from add liberary files. Downold the NodeMCU boards from preferences, by inserting the library link in it. Set The Output Of NodeMCU (D0 – D14) For Different Control Function. Compile the Typed Programme check whether error are occur or not….Upload the Programme onto NodeMCU using mocro-type USB Cables. Then Connect the NodeMCU Module to the Internet using Router/Hotspot. Now Pair The NodeMCU Module With Android Application. i.e. Blynk App.

IV. CONTROL TYPE

4.1 Manual Control

Now Set The Function of Switches In Application. Checkout All the Connection First. Now to Test the Model.

4.2 GSM Control

In order to control the ON-OFF action for electric devices, you need to send the SMS.
I will send SMS like #A.relay1 on*. This SMS is received by GSM Modem and given to microcontroller. Microcontroller will decode the SMS and turns ON the RELAY 1.
If I send SMS like #A.relay1 off*. This SMS is received by GSM Modem and given to microcontroller. Microcontroller will decode the SMS and turns OFF the RELAY 1.

V. BLOCK DIAGRAM

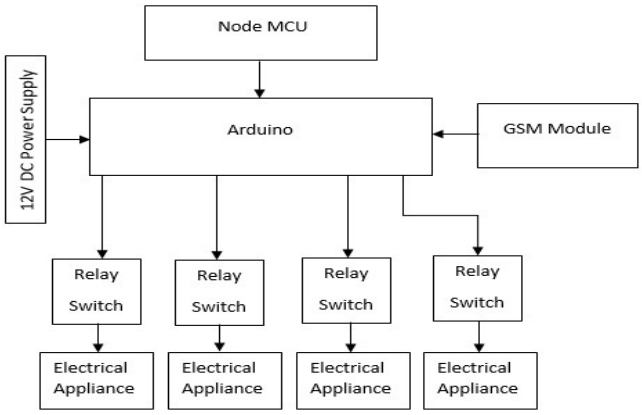

Fig 1. Block Diagram of Home Automation System

5.1 Smart Phone

Used for controlling Purpose, for giving command and gain output, for this blynk Android app is required. The Controlling can be done by two methods. First by Manual voice commands using Google b. NodeMCU Esp-Microcontroller). To take input From the Blynk Server, by accessing it using internet and perform operation. Per program fed in the Microcontroller and obtain output as per user requirements.

5.2 b. Node MCU ESP 8266

To take input From the Blynk Server, by accessing it using internet and perform operation. As per program fed in the Microcontroller and obtain output as per user requirements.

5.3 Relay Driver

Basically the output of microcontroller is in Mili-volts so this output volt is not sufficient to run the bulky load output. So as to run the appliances on we require an Relay module so the output is fed to the relay module according to given

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input to the relay module it will generate output and drive various appliances and load e.g. Lamp, Fan, Tube light ,T.V, etc.

VI. PROCEDURE

For the setup of home automation we require a NodeMCU 8266, Relay. Blynk Application, Blynk Libraries, and Loads. Firstly Make Connections as per circuit diagram, connect the relays with NodeMCU, and then connect the NodeMCU with Computer using USB cable to load the program.

6.1 Blynk Configuration

Now install the Blynk Application in Smartphone from Play store. Run the application, Login or create an account using Gmail or FB. Now click on the new project option the create a new project and label it, like Home Automation, then click on the plus icon, add the switch to the work area, after adding the switch click on it, to configure it, label the switch, the select Mode of switch to Switch mode. Then select the Output pins to Digital, then select the pin number (Gp 0 to Gp 16) this pin will be the output of NodeMCU, Select the Pins that are interfaced with Relays.

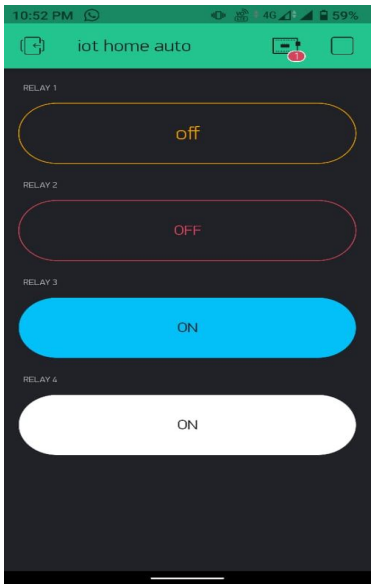

Fig 2. Blynk Interface

VII. ADVANTAGES

7.1 Savings

Smart thermostats and smart light bulbs save energy, cutting utility costs over time. Some home automation technologies monitor water usage, too, helping to prevent exorbitant water bills. Certain devices even offer rebates.

7.2 Convenience

Because home automation technology performs rote tasks automatically, end users experience great convenience. Lots of smart gadgets are compatible with one another, and you can set different triggers between devices to automate regular home processes. For instance, you could set your smart locks to turn on your smart lighting when you unlock the front door.

7.3 Comfort

Some people use smart technology to record shows or to play music throughout the home. Connected devices can also help create a comfortable atmosphere they provide intelligent and adaptive lighting, sound, and temperature, which can all help create an inviting environment.

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VIII. 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 Built this Project as a part 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. Home automation is a resource which can make home environment Automated. People can control their electrical devices via. Smartphone. These home automation devices and set-up controlling action through Smartphone. In future these products may have high potential for marketing

IX. FUTURE SCOPE

Future Scope for the home automation system involves making homes even smarter. Homes can be interfaced with the sensors including the motion sensors, light sensors and temperature sensors and thus this may provide the automatic toggling of the devices according to the conditions. More energy can be conserved by ensuring occupation of the house before turning on devices and checking the brightness and turning off the light if not necessary. The User can control their home appliances worldwide using Blynk app it can be further developed and can be used in agricultural sections, Car parking systems etc. The system can be integrated closely with the home security solutions enhancing the safety for home owners.

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