



HOME AUTOMATION SYSTEM USING GOOGLE ASSISTANE

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Abstract-

Home automation system achieved great popularity in the last decades, and it increases the comfort and quality of life. In this paper an overview of current and emerging home automation systems is discussed. Nowadays most home automation systems consist of a smart-phone and micro-controller. A smart phone application is used to control and monitor the home appliances using different type of communication techniques. In this paper the working principle of different type of wireless communication techniques such as Zig-Bee, Wi-Fi, Bluetooth, Ocean and GSM are studied, and their features are compared with each other so the users can choose their own choice of technology to build home automation system. Home automation system is growing rapidly, they are used to provide comfort, convenience, quality of life and security for residents. Nowadays, most home automation systems are used to provide ease to elderly and disabled people, and they reduce the human labor in the production of services and goods. Home automation system can be designed and developed by using a single controller which has the ability to control and monitor different interconnected appliances such as power plugs, lights, temperature and humidity sensors, smoke, gas and fire detectors as well as emergency and security systems One of the greatest advantage of home automation system is that it can be controlled and managed easily from an array of devices such as smart-phone, tablet, desktop and laptop.

Keywords—switching circuit, google assistant, Arduino, IFTTT, Smart Device etc,

1. INTRODUCTION This home automation system or device can regulate the household electrical or electronic device with the Arduino circuit when the person is remotely available. A Blynk App can turn ON any device with the help of relay and turns OFF the device when a person is remotely not available. The google assistance can help them in regulating the household device. The google assistant is connected to the node MCU with suitable applications. The device can be regulated, as google assistant possess voice recognition artificial intelligent. The Arduino, cloud-based service and IFTTT a web-based service has been implemented in the project.

2. Node MCU



Fig. 1. Node MCU

MCU This is a single board micro controller open source, internet of things proclamation which includes ESP 8266 Wi-Fi module firmware. It has the memory of 128K bytes and the storage is about 4M bytes. The power is given by either USB or battery 9 VOLT. Node MCU supports the MQTT- IOT protocol. There are forty different modules of node MCU are available and with relevant to the project, the modules can be selected. It is a system on chip open source software and hardware development environment which can be used for monitoring, controlling and analysis, etc.,

3. Relay



Fig. 2. Relay

It is an electrically operated switch. The electromagnet is used in the relay to switch over the circuit mechanically. The relays are used to control a circuit by a low power signal or to control several circuits by one signal. There are many classifications of relays depending on their function for which they are used. Some of them include monitoring, protective, regulating, reclosing, auxiliary relay. It operates on small electric current which regulates the device which can handle even large electric current.

4. MODEL DESIGNING

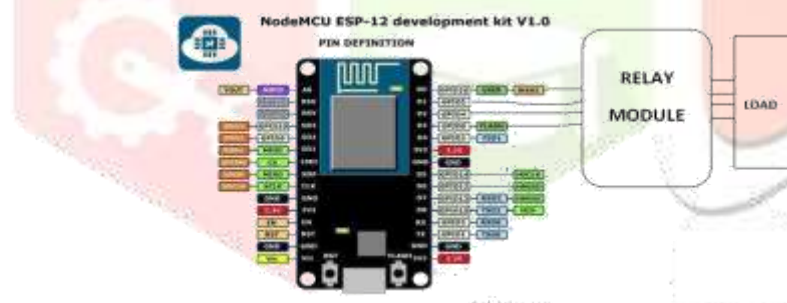


Fig. 3. Base Model

Wi-Fi Modules for the Internet of Things (IoT) **ESP8266**, In short, the ESP8266 module is a TTL "Serial to Wireless Internet" device. Providing your microcontroller has the ability to talk to a TTL serial device (*most do*) you'll be in business! The original instructions have been translated from Chinese into cryptic data sheets. The ESP8266 module is a 3v device, but it's no wimp. It draws quite a bit of power. In fact, you'll probably need to make sure that your circuit's power supply can handle at least 1 amp of power. (In my case, I was using a simple 7.5v 500ma power supply. When I started working with this module, I switched it for a 7.5v 1amp power supply and had plenty of power.) As it turns out there is good reason for this; some YouTube videos have surfaced recently with folks seeing anything from 500 meters to a couple miles of transmission capability from this module.

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Ocean and GSM are studied, and their features are compared with each other so the users can choose their own choice of technology to build home automation system. Home automation system is growing rapidly, they are used to provide comfort, convenience, quality of life and security for residents. Nowadays, most home automation systems are used to providing the production of services and goods. Home automation system can be designed and developed by using a single controller which has the ability to control and monitor different interconnected appliances such as power plugs, lights, temperature and humidity sensors, smoke, gas and fire detectors as well as emergency and security systems One of the greatest advantage of home automation system is that it can be controlled and managed easily from an array of devices such as smart-phone, tablet, desktop and laptop.

It starts with initiating the Google – assistant by uttering the word “ok Google”. Here the load that was connected is the home amenities like LED, fan and light. For example, LED can be turned on by saying the command “turn LED on”, the Google assistant will then show its acceptance through voice command and also display it as “turning ON LED” and concurrently the LED gets ON. Similarly, turning OFF the LED is done by saying “turn off LED” and again it will respond to the command given and turn OFF the LED along with the command and by displaying “turning OFF LED”. Likewise, the home appliances like fan, light are controlled in the similar way, without any physical contact with the appliances.

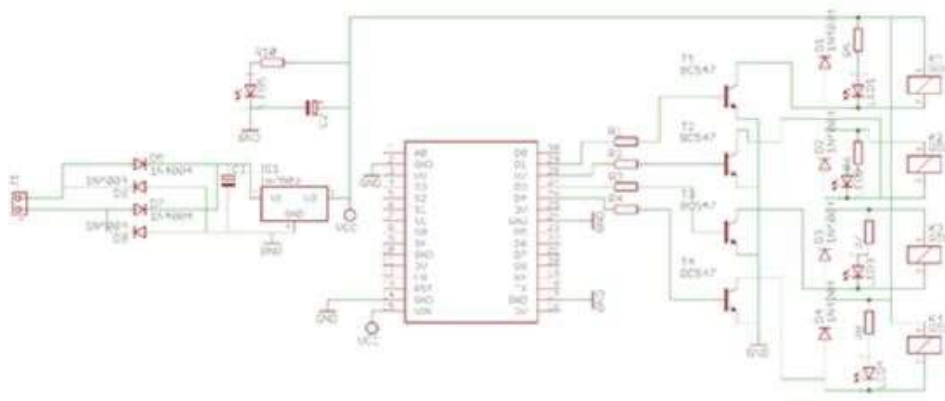


Fig. 4. Circuit Diagram

5. WORKING

Home automation refers to the ability of your home to make its own decisions depending on environment conditions and give you the option to control it from a remote location. In one of our previous tutorial on the ESP8266 WIFI Module, we examined how NodeMCU or any of the other ESP8266 based boards can be used to build a web server through which all the GPIOs of the board can be controlled over WIFI. Today, we are going to put that web server in use and control home appliances with it.

project is the WIFI enabled board that needs no introduction; the ESP8266 based NodeMCU development board. It is an open source platform for developing WIFI based embedded systems and it is based on the popular ESP8266 WIFI Module, NodeMCU firmware. NodeMCU was born out of the desire to overcome the limitations associated with the first versions of the ESP8266 module which was not compatible with breadboards, it was difficult to power and even more difficult to program. The NodeMCU board is easy to use, low cost and that quickly endeared it to the heart of makers, and it is one of the most popular boards today. we will add a 2-channel relay module to the ESP8266 board. The project flow involves the control of NodeMCU GPIOs from a webpage on any device connected on the same network as the board. The status of the GPIOs control the coils of the relays and that causes the relay to alternate between normally open (NO) and normally closed (NC) condition depending on the state of the GPIO, thus, effectively turning the connected appliance “ON” or “OFF”. One of the easiest ways to program NodeMCU is via the Arduino IDE. This, however, requires setting up the Arduino IDE by installing the board support file for NodeMCU. If you are using the Arduino IDE to program the NodeMCU for the first time, you need to do this first before proceeding with this tutorial. Follow the detailed tutorial “Getting Started with the NodeMCU” to learn how to set up your Arduino IDE to program ESP8266 based boards.

The code for today’s tutorial is a modified version of the code from the last article “NodeMCU ESP8266 Web Server Tutorial“. The code is based on the `ESP8266WIFI.h` library which allows the easy use of WIFI functionalities of the board. It contains all we need to create or join a WIFI access point and also create a server

and client which are all important for today's project. The library comes attached with the NodeMCU board files for the Arduino, so there is no need to install it once the board files have been installed.

6. RESULT

In this project the loads are made to work automatically with the help of google assistant through the cloud service and the commands give like "ON" and "OFF" the home amenities are controlled based on the commands given by the user and also this automation can be work by Blynk App, we can control a set of devices connected to a relay and by Google assistant and Blynk App we can control and Monitor a particular device at a time. From the relay the loads are connected and controlled by normal procedure and also done by Smart devices.

Fig. 5. Table 1: Performance analysis with other system

System developed with	System failures during minimum trials out of 10	% Error
Bluetooth	6	60%
Cellular	5	50%
Wi-fi	1	10%

The performance of different systems will be visualized simultaneously.

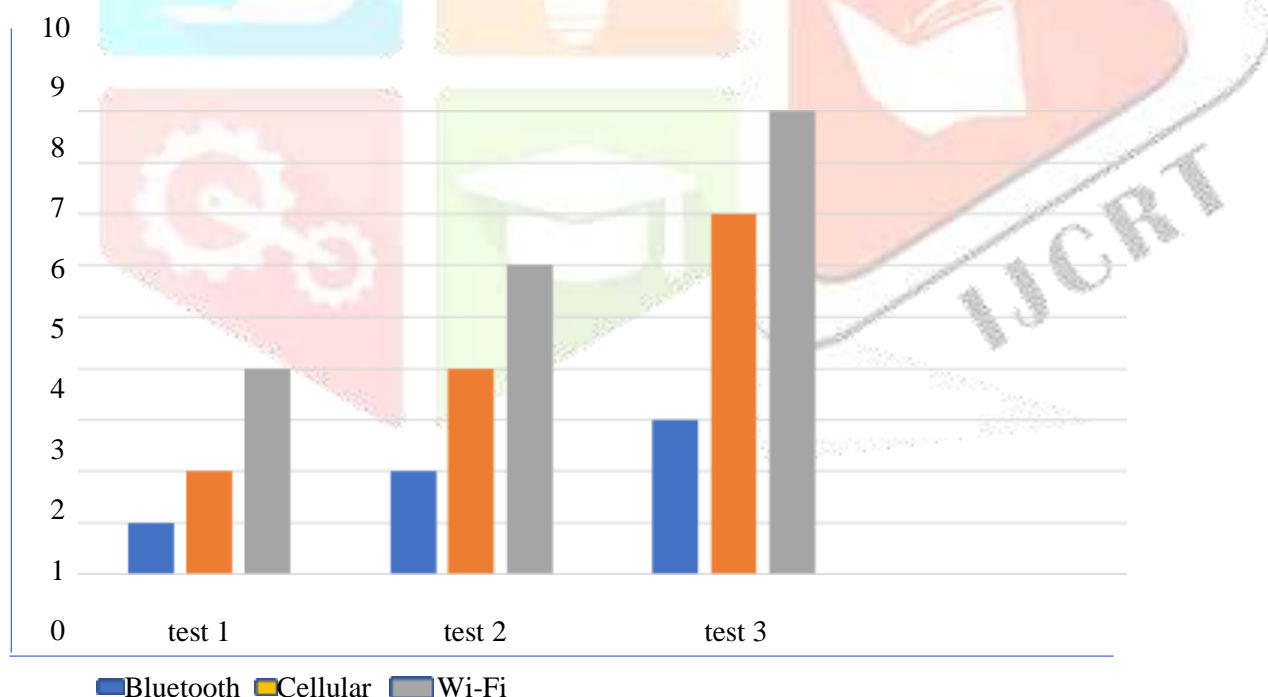


Fig. 6. Graph Of Testing Home-Automation Service Over Different Mediums

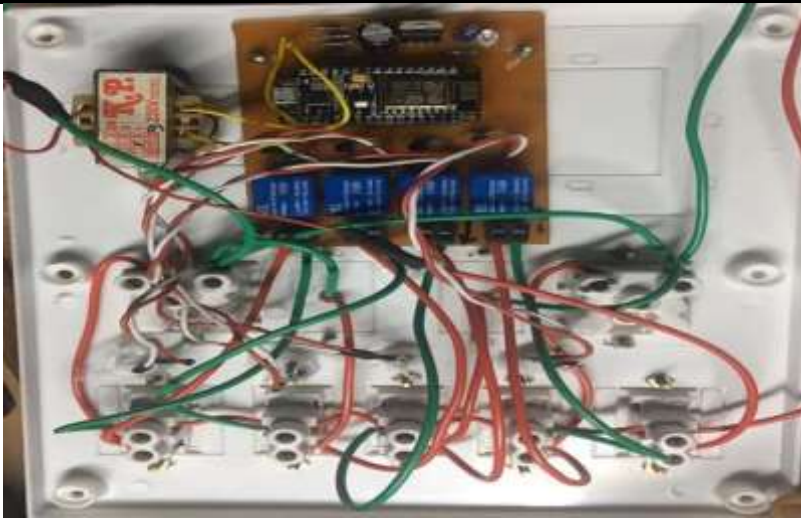


Fig. 5. BARE ESP8266 SETUP



Fig. 6. Actual Model Setup



Fig. 7. Original Model Output with Blynk App

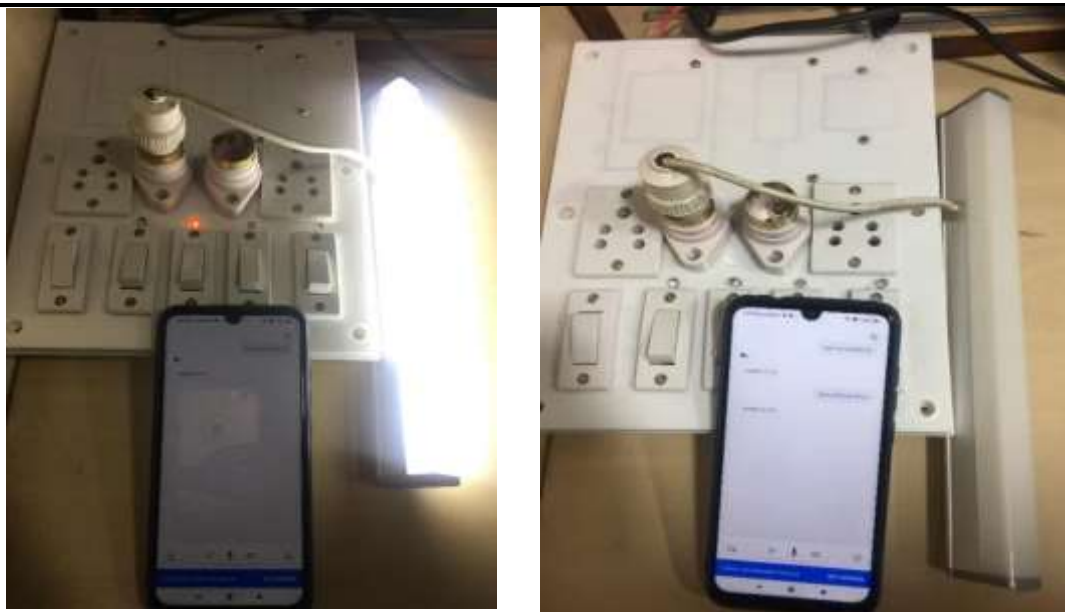


Fig. 8. Original Model Output with Google Assistance

7. CONCLUSION

In This System Arduino plays a vital part in home automation system and the switching circuit as well. In this paper the Google assistant interfaced with the node MCU and the switching circuit is more efficient and easier to implement. Which is as similar as the normal ON and OFF switches does. Here we can do switching Process through Blynk App even if we are out of our home, just to open Blynk app and tab on virtual switch on app and it will on the home appliances. In google assistant app the switching process is done by the voice command given to the Google apps like Google search, Google Assistant App, which is hands free process. This may have available in all the smart phones and a greater number of devices can be interfaced and regulated through cloud of Google Drive. This may also upgrade as Future scope with other Virtual Assistance App like SIRI in Apple Product, and, also in ALEXA which is depend upon the requirement of customers in real life.

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