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Home Automation "Using Node MCU & Blynk''

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ABSTRACT: Our lives are becoming simpler and easier in all respect as automation technology advances. With advancement of Automation technology, their a lot of advancement in hardware as well as software. In today's world Automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IoT is the latest and emerging internet technology. Internet of things is a growing network of everyday object-from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities. 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. In this paper we present a Home Automation system(HAS) using Blynk Community that employs the integration of cloud networking, wireless communication, to provide the user with remote control of various lights, fans, and appliances within their home and storing the data in the cloud. The system will automatically change on the basis of sensors' data. This system is designed to be low cost and expandable allowing a variety of devices to be controlled

KEYWORDS: Home automation, Node MCU, Blynk, IOT

I.INTRODUCTION

The Internet of Things or IOT is a future technology that allows you to control hardware devices over the Internet. Here we propose to use IOT to control home appliances and automate modern homes over the Internet. This system will be demonstrated as a home appliance controller using 4 loads.

Our user-friendly interface allows every users to quickly control these home appliances over the Internet around the world. This automated system uses a Node MCU (Node Microcontroller Unit). This microcontroller is connected to a relay modem to easily receive user commands over the Internet. Relays are used to switch loads. This entire system is powered by a 5V adapter / charger (micro type). As soon as itreceive user commands over the Internet, NodeMCU processes these instructions, manipulates these loads accordingly, and hence results in displaying the system status on the smartphone display. Therefore, this system enables efficient home automation on the Internet. You used the Blynk Community application to control appliances around the world. The method used for control is , which swipes the smartphone number, or voice control using the Google Assistant. We then used the latest technology, the IFTTT platform and WebHooks, to trigger the circuit. The circuit is triggered when you receive an input command from the Google Assistant.

II.SYSTEM MODEL AND ASSUMPTIONS

1)   BLUETOOTH BASED HOME AUTOMATION SYSTEM USING CELL PHONES:

- In Bluetooth based home computerization framework the home apparatuses are associated with the Arduino BT board at input yield ports utilizing transfer.
- The program of Arduino BT board depends on undeniable level intelligent C language of microcontrollers; the association is made through Bluetooth.

- The secret phrase insurance is given so just approved client is permitted to get to the machines.
- The Bluetooth association is laid out between Arduino BT board and telephone for remote correspondence. In this framework the python script is utilized and it can introduce on any of the Symbian OS climate, it is convenient.
- One circuit is planned and executed for getting the criticism from the telephone, which show the situation with the gadget.
- In Bluetooth-based home automation systems, appliances are connected to the Arduino BT board at input / output ports using relays.
- The Arduino BT board program is based on the high-level microcontroller interactive programming language C. The connection is via Bluetooth.
- Password protection is provided to ensure that only authorized users can access the appliance.
- A Bluetooth connection is established between the Arduino BT board and the phone for wireless communication. This system uses Python scripts and is portable and portable to the Symbian operating system environment.
- The circuit is designed and implemented to receive feedback from the phone indicating the status of the device.

2) GSM-based home automation system Using mobile phones:
- With mobile phones and GSM technology, GSM-based home automation is fascinating to research.
- SMS-based home automation, GPRS-based home automation, and DTMF-based home automation. These options were considered primarily for communication over GSM.
- Home sensors and devices interact with the home network and communicate via GSM and SIM (Subscriber Identification Module).
- The system uses transducers that convert machine functions into electrical signals that are supplied to the microcontroller.
- The sensors in the system convert physical properties such as sound, temperature, and humidity into other quantities such as voltage.
- The microcontroller analyzes all signals and translates them into commands that the GSM module can understand.
- Select the appropriate communication method from SMS, GPRS, and DTFC based on the command received from the
- GSM module.

3) WIFI-based home automation system using mobile phones:
- WIFI-based home automation system mainly consists of three modules: server, hardware interface module, and software package. increase.
- This figure shows the layout of the system model. WiFi technology is used by the server and the hardware interface module to communicate with each other.
- The same technology is used to log in to the web-based application on the server. Remote users can use a compatible web browser to access web-based server applications over the Internet. The latest home automation system software is divided into server application software and microcontroller (Arduino) firmware.
- Written in C language and using the IDE, Arduino software comes with the microcontroller itself. Arduino software collects events from connected sensors, applies actions to actuators, and is pre-programmed on the server.
- Another task is to report the history and record it in the server DB. The proposed home automation system server application software package is a web-based application built using asp.net.
- If you are using an internet navigator that supports asp.net technology, you can access the server application software over the internal network or the internet if the server has a real IP address on the internet.
- There is a problem with the server application software. Maintenance, setup and configuration of the entire home automation system.

III. CIRCUIT DIAGRAM

1) Make Connection As Per Circuit Diagram, Make Connection On NodeMCU
2) And Then Connect NodeMCUTo The Wifi using hotspot/Router.
3) Then Connect The NodeMCUpins Output To The Relay Driver Circuit
4) Then Start Programming the NodeMCU Module.
5)   Programme The NodeMCU Using Aurdino IDE Software.
6)   Download the Blynk Liberary zip File, Install it from add liberary files.
7)   Downold the NodeMCU boards From preferences, by inserting the library link in it.
8)   Set The Output Of NodeMCU (D0 – D14) For Different Control Function.
9)   Compile the Typed Programme check whether errors are occur or not….
10) Upload the Programme onto NodeMCU using mocro-type USB Cables.
11) Then Connect TheNodeMCU Module To the Internet using Router/Hotspot.
12) Now Pair The NodeMCU Module With Android Application .   i.e Blynk App.
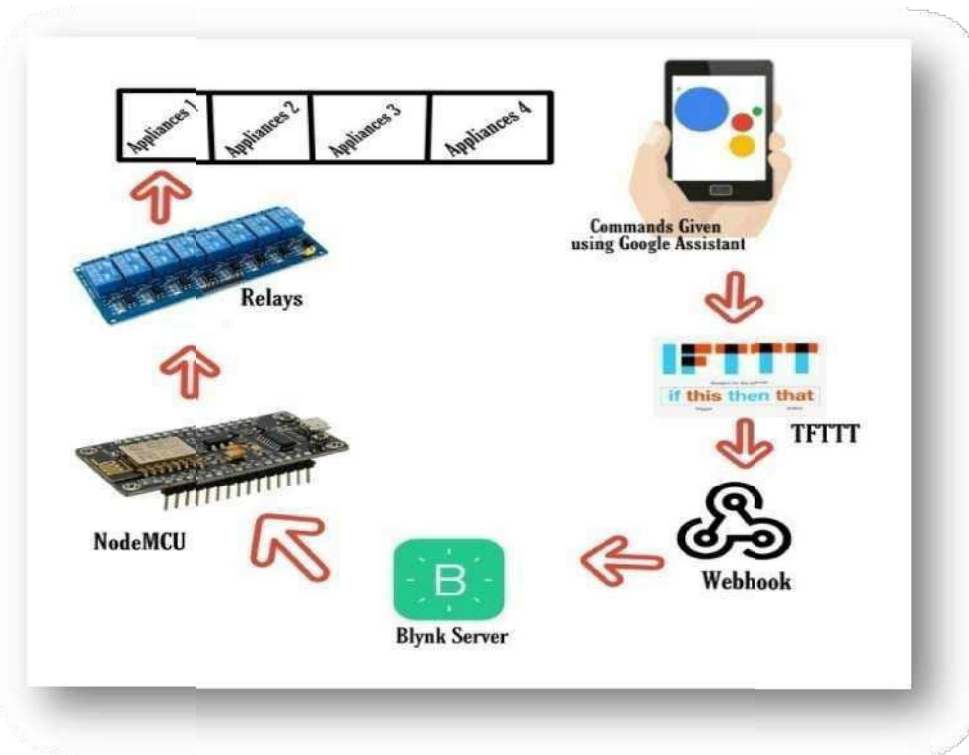
Smart Phone

By using this controlling purpose, and even to provide command and to get output, we use this blynk android application.

NodeMCU Esp-8266

To take input which perform operation and as per programmer which is feb in microcontroller and obtain output as per user requirement.

Relay Driver

Basically, the output of the microcontroller is shown in millivolts, so the output voltage which is not enough to drive a bulky load output. A relay module is required to run the device at 230V. This will supply output to the relay module.

Depending on the input of the relay module, an output is generated to drive various devices and loads. Lamps, fans, tube lights, TVs, etc.

Output
These are the outputs generated from specific inputs from the user. Users can configure different output sections for the and get outputs via one of the sections such as Home Unit A for Lights, Home Unit B for Fans, Home Unit C for
 T.V. increase.

Home appliance A
Home appliance B
Home appliance C
Home appliance D
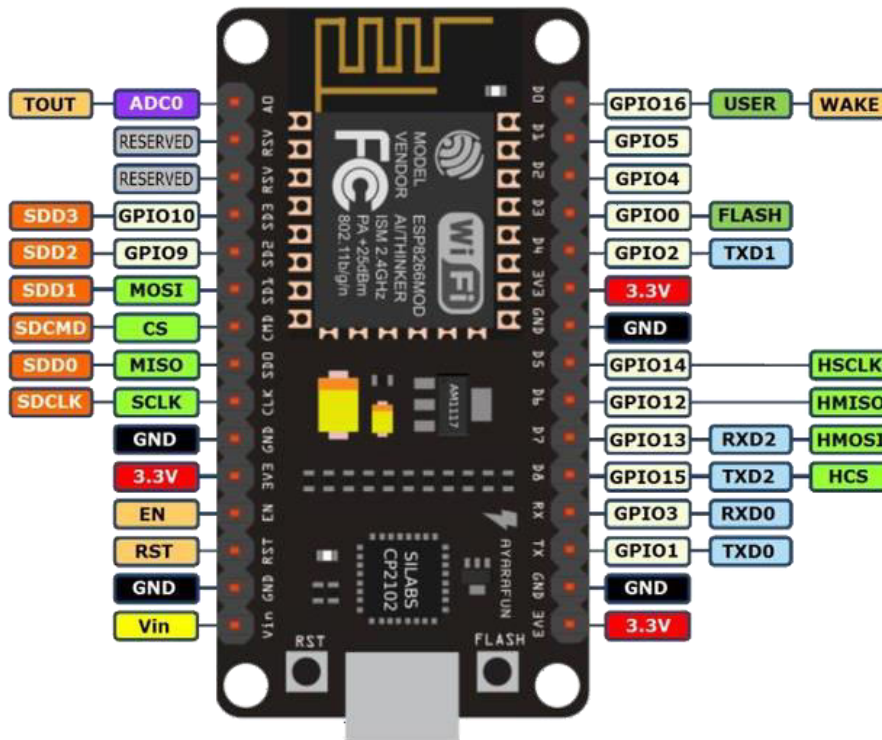
Pin Category	Name	Description
Power	Micro-USB, 3.3V, GND, Vin	**Micro-USB:** NodeMCU can be powered through the USB port **3.3V:** Regulated 3.3V can be supplied to this pin to power the board **GND:** Ground pins **Vin:** External Power Supply
Control Pins	**EN, RST**	The pin and the button resets the microcontroller
Analog Pin	A0	Used to measure analog voltage in the range of 0-3.3V

GPIO Pins	GPIO1 to GPIO16	NodeMCU has 16 general purpose input-output pins on its board
SPI Pins	SD1, CMD, SD0, CLK	NodeMCU has four pins available for SPI communication.
UART Pins	TXD0, RXD0, TXD2, RXD2	NodeMCU has two UART interfaces, UART0 (RXD0 & TXD0) and UART1 (RXD1 & TXD1). UART1 is used to upload the firmware/program.
I2C Pins		NodeMCU has I2C functionality support but due to the internal functionality of these pins, you have to find which pin is I2C.

IV. RESULT AND DISCUSSION

1.   Savings:
 Brilliant indoor regulators and savvy lights save energy, reducing utility expenses over the long run. Some home mechanization advancements screen water use, as well, assisting with forestalling extravagant wate r bills. Certain gadgets significantly offer discounts.

2.   Convenience:
Since home mechanization innovation performs repetition undertakings naturally, end clients experience extraordinary accommodation. Loads of shrewd contraptions are viable with each other, and you can set various triggers between gadgets to computerize normal home cycles. For example, you could set your shrewd locks to turn on your brilliant lighting when you open the front entryway.
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3.   Control:
Purchasers likewise pick brilliant home gadgets to more readily control capacities inside the home. With home mechanization innovation, you can know what's going on inside your home consistently.

4.   Comfort:
 Certain individuals utilize brilliant innovation to record shows or to play music all through the home. Associated gadgets can likewise assist with making an agreeable air — they give smart and versatile lighting, sound, and temperature, which can all assist with establishing an intriguing climate.

5.   Peace of Mind:
 At long last, numerous buyers put resources into home robotization innovation for genuine serenity. Another mother or father can keep an eye on their little one because of savvy cameras and different advancements. Or on the other hand, on the off chance that you can't recall whether you shut the carport after you left, you can check from a distance with an application.

Following are the application of home automation.
1.   Heating, ventilation and cooling (HVAC): it is feasible to have controller of all home energy screens over the web consolidating a basic and cordial UI.

2.   Lighting control framework:
A   "smart" network that consolidates correspondence between different lighting framework sources of info and results, utilizing at least one focal registering gadgets.

3.   Occupancy-mindful control framework:
It is feasible to detect the inhabitance of the home utilizing savvy meters[14] and natural sensors like CO2 sensors,[15] which can be incorporated into the structure robotization framework to set off programmed reactions for energy productivity and building solace applications.

4.   Appliance control and coordination;

With the shrewd lattice and a savvy meter, making use, for example, of high sunlight powered charger yield around mid-afternoon to run clothes washers.

5.   Home robots and security:

A   household security framework coordinated with a home robotization framework can offer extra types of assistance like distant observation of surveillance cameras over the Internet, or access control and focal locking of all border entryways and windows.

6.   Leak discovery.

smoke and CO locators.

7.   Home robotization for the older and incapacitated.

8.   Smart Kitchen and Connected Cooking.

Utilizing Voice control gadgets like Amazon Alexa or Google Home to kitchen apparatuses.
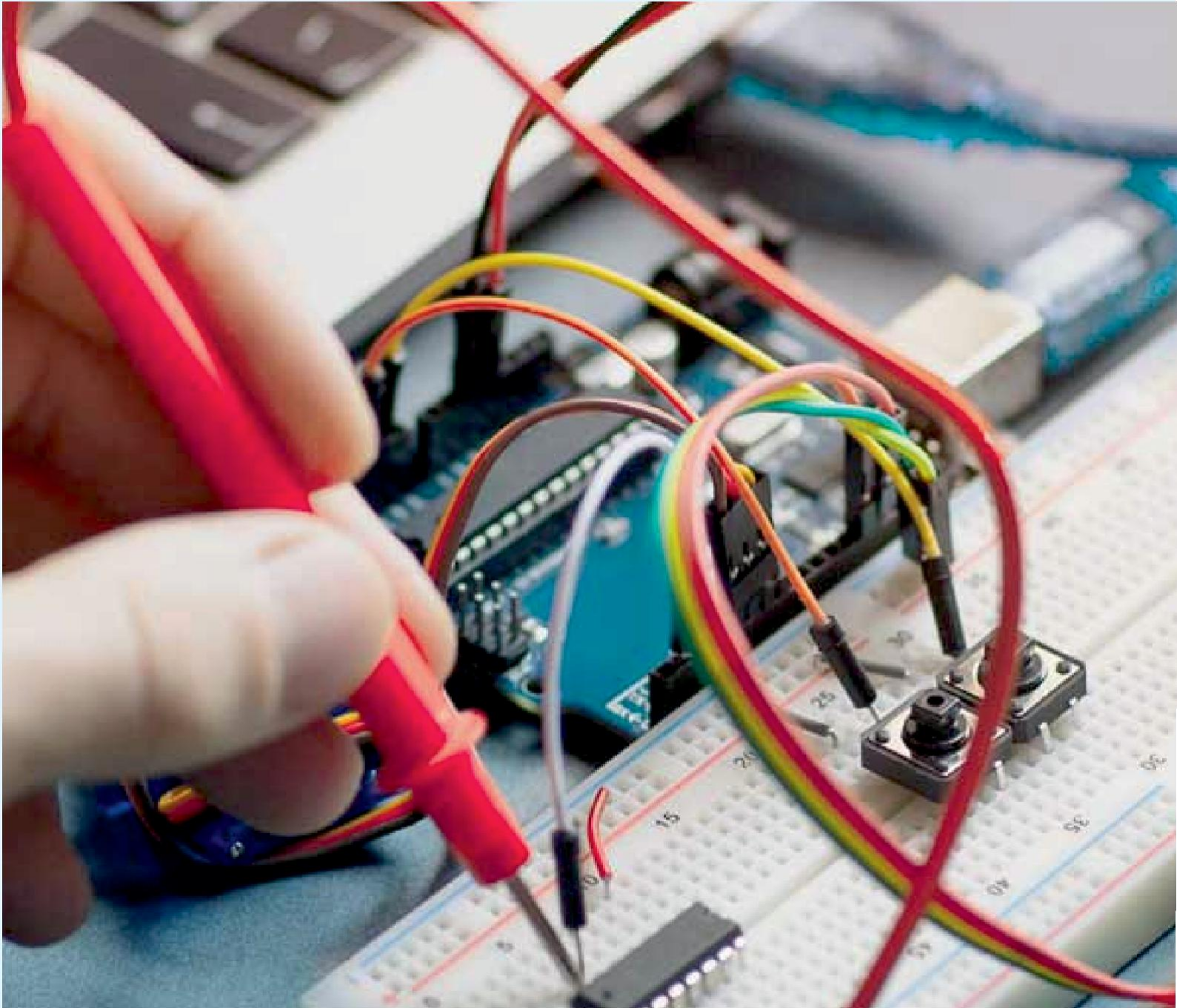
V.CONCLUSION

While wearing out this attempt we have gotten a great deal of learning about different modules being utilized in this task. We are happy we can Built this Project as a section in this undertaking and set up new thoughts. We accept the task finishes depending on the situation and the information got amidst this period will be utilized in our future corporate life. Also, we should incorporate that home computerization is the destiny of spots of new world.

Home robotization is an asset which can make home climate Automated. Individuals have some control over their electrical gadgets by means of. Cell phone These home robotization gadgets and set-up controlling activity through portable. In future these items might have high potential for promoting.

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