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Home Automation System Using Blynk

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Abstract - This paper represents a reliable, rapid, and value-efficient clever domestic automation gadget. In current years, we are acquainted with much domestic automation or home devices which help to ease our paintings and decrease time and value. Over those years, we observed many home automation technologies brought from Zigbee automation to Amazon Echo, Google Home, and Home from Apple. These days, it has emerged as a want of everyone's. Google Home charge is approx. 150$ (USD) with an additional fee of the gadgets to be connected to, the total price of the whole tool reaches over 250$ (USD). Apple Home Kit is greater expensive, close to approximately 100$ (USD) more than the Google Home just for a setup. We can manipulate aver 30,000 smart home gadgets like TVs, far-flung controls, lights, and more the usage of Google Nest or Google Home speaker or display. The GosundA 15A clever WiFi light can be control by the manner of far-flung and additionally work with google assistant, and the fee you much less than 15$ Philips Hue, that is a smart light can be controlled via the Amazon Echo, Google Assistant and Siri, voice assistant with the aid of Apple is priced close to approximately 145$ (USD). So, overall, we are able to see here that to make our domestic smart we need to invest a variety of money, let's say a few 250$ (USD) for simply a simple setup. What if we are capable of automating our house within (charge of the Smartphone is not blanketed as its miles assumed to be owned through every man or woman these days) 10$ (USD) and can manage up to eight appliances the use of Google Assistant? Well, this paper describes all approximately the implementation of such a gadget. The system can control regular family appliances. The user offers voice instructions to the Google Assistant and with the assist of IFTTT utility and the Blynk utility. The instructions given thru the Google Assistant are decoded and then sent to the microcontroller, the microcontroller, in turn, controls the relays associated with it as required, turning the tool associated with the respective relay On or OFF as according to the clients request to the Google Assistant.

1. INTRODUCTION

Home, it's far the location wherein one can relax after a protracted tiring day. People come home exhausted after an extended running day. Some are too tired that they are able to rarely move once they land on their sofa or bed. So, any device/era that might assist them to exchange their lights, fanatics on/off, or play their preferred music, etc., with their voice with the help of their clever telephones could make their domestic greater relaxing.

Moreover, it would be higher if many kinds of stuff consisting of warming bathtub water and maintaining the room temperature had been already done before they attain their domestic just by using giving a voice command. So, when people could arrive home, they would find the room temperature as they want, the bathwater adjusted to their suitable preferences, and that they could loosen up proper away and feel snug and rather, feel more homely.

Human assistants like housekeepers had been a manner too expensive to keep up their homes inside the past. Even now when technology is handy sufficient simplest the well to do people of the society are blessed with these new smart domestic devices, as those devices fees are a piece high. However, not all of us are wealthy sufficient with a view to affording a human assistant or some clever domestic kit. Hence, the need for finding a less expensive and smart assistant for everyday families maintains growing.
This paper proposes a low-cost system. It uses the Google Assistant, the IFTTT application, the Blynk application, and the NodeMCU microcontroller as the major components along with a relay board Comprising of 4/eight relays together with ULN 2803 IC. A natural language voice is used to give instructions to the Google Assistant. All of the additives are connected over the net the usage of Wi-Fi which places this system underneath the IoT.

2. SYSTEM DESIGN ANDIMPLEMENTATION

There are two types of Categories:

• **The hardware:** Hardware has the capability to connect to the router. It could also responsible for turning on/off devices, such as fanatics and lights. So, it is called the 'Control Unit'. And,

• **The Software:** Software consists of the Arduino IDE software, the Blynk application, the IFTTT app and the Google Assistant constitute the software of the design and these applications might be integrated within the Android device.

The Control Unit incorporates of the microcontroller NodeMCU and the Relay board. Relay board makes use of ULN 2803 IC to manipulate the relays. The Blynk app on an Android device communicates with the microcontroller and sends the desired signal thru the internet.

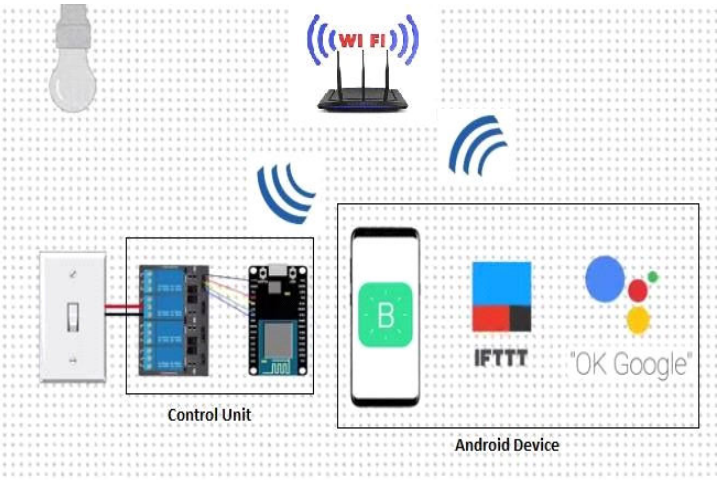


Fig -1: Basic System Architecture

- **NodeMCU(ESP8266)**

The Node Microcontroller Unit in speedy NodeMCU is an open-source software program and hardware development platform built around all the low-cost System-on-a-Chip (SoC) program called as the ESP8266. The ESP8266 is designed and developed by Express, consisted entirely of many key elements of modern computing, along with CPU, RAM, Wi-Fi, or even the current operating system and SDK. The intention of the NodeMCU is to simplify ESP8266 development. When purchased at bulk, the ESP8266 chip costs only $2 USD apiece. So, it a superb preference for this system design.

The NodeMCU has key components:

• he open-source ESP8266 firmware is built on the top of the proprietary SDK of the chip manufacturer. The firmware provided a new development platform mainly based on eLua (embedded Lua), which is a completely easy and speedy scripting language with an established developer community. For newcomers, the Lua scripting language is straightforward to learn. And to add on NodeMCU may be programmed with the Android IDE too.
• An improvement package board that includes the ESP8266 chip on a modern-day circuit board. The board has an included USB port this is already confused out up with the chip, a hardware reset button, Wi-Fi antenna, LED lights, and preferred-sized GPIO (General Purpose Input-output).

- **RELAY BOARD**

A relay is an electromagnetic switch. It consists of five pins. They are 2 coil pins, 1 connection pin, 1 no connection pin, and 1 commonplace pin. Normally a relay is used in a circuit as an automatic switch. There are different varieties of relays and they function at distinctive voltages. In this gadget, the relay circuit is used to show ON/OFF the appliances. The high/low sign is supplied from the NodeMCU microcontroller. When a low voltage is given to the relay that is related to an appliance its miles turned off and while a high voltage sign is given it becomes on. The relay circuit to drive four appliances inside the Home automation machine. The variety of gadgets can be modified according to the user's requirements.

Fig -2: NodeMCU (ESP8266) Development Board

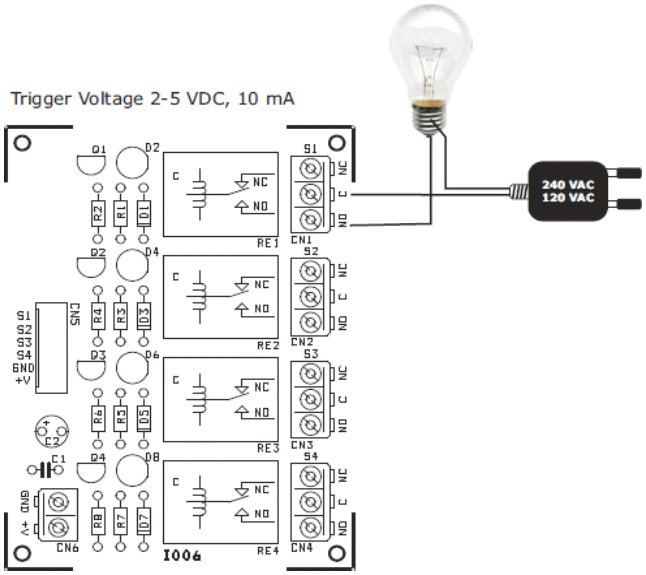
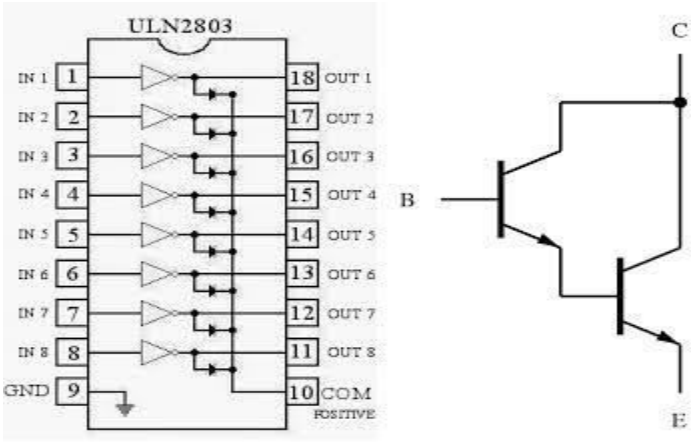


Fig -3: Relay Board Wiring Diagram

- **ULN 2803IC**

ULN 2803 IC is used as a relay driver which consists of octal excessive voltage. It is an immoderate voltage, immoderate present-day Transistor Array IC used with Microcontrollers wherein we need to drive immoderate energy loads. This IC is broadly applied in Lamps, relays, cars to drive immoderate loads.
Most of the Chips operates with low degree signals. The ULN2803 IC consists of 8 NPN Darlington pairs which provide the right advanced-day amplitude through loads. A Darlington pair provide an excessive present day-day-day advantage with the assist of a two-transistor that acts as a single transistor. In this pair the contemporary amplified by way of the primary transistor is in addition amplified by using the following transistor gives high contemporary to the output terminal.



a. b.

Fig -4: ULN 2803 and Darlington Pair

- **BLYNKAPPLICATION**

Blynk application is particularly designed for the internet of things. It is a Platform with iOS and Android apps to govern Arduino, Raspberry Pi, NodeMCU, and several other boards over the Internet. It can manage hardware remotely, it is able to show sensor data, keep data, visualize it, and do many different things.
Blynk Application setup is necessary; we should set it up as in keeping with the requirement. We initiate by using growing a task and then deciding on the microcontroller we are using. After that, we create the toggle buttons for every relay blended with the digital pins of the microcontroller. When that is done, the Blynk app sends an authentication token to the registered email identification for this specific assignment. This token should be referred to and saved for its use. Because at the same time as programming the NodeMCU and putting in place the IFTTT application this token is useful.

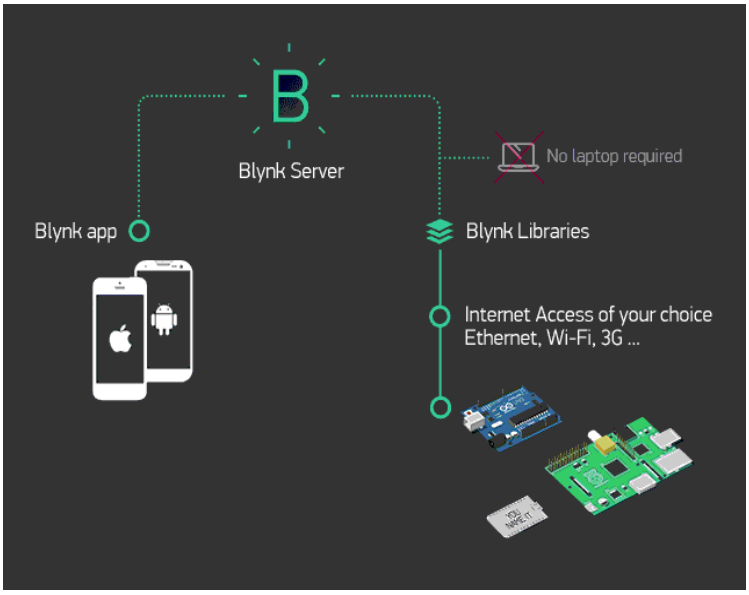


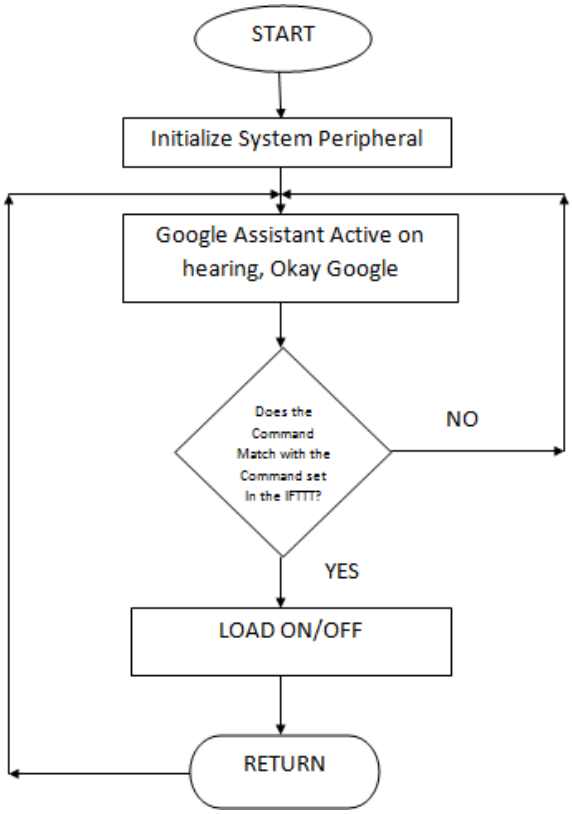
Fig -5: Functioning of the Blynk Application

- **IFTTT APPLICATION**

IFTTT is mean “if this then that.” IFTTT is each an internet site and a cellular app that released in 2010 and has the slogan "Put the Internet to work for you". We can automate the whole thing from the application with the assist of IFTTT. the employer gives a software platform that connects apps, gadgets, and offerings from different developers with a purpose to get right of entry to one or more automation concerning one's apps, devices, and offerings. Here, IFTTT utility is used as a mediator among the Google Assistant instructions and the Blynk app.

Setting up the IFTTT software first requires logging in and then we need to create an applet and then “This”, i.e. The trigger, right here we pick out Google Assistant, and then we are able to type inside the instructions to which the Google Assistant has to reply and to this command, it needs to manipulate the appliance. The response command from the Goggle Assistant also can be typed in as want.

- **FLOWCHART**



- **RESULT**

The result was good, and the system was reacting well. The following diagram shows the full implementation program bymodel.

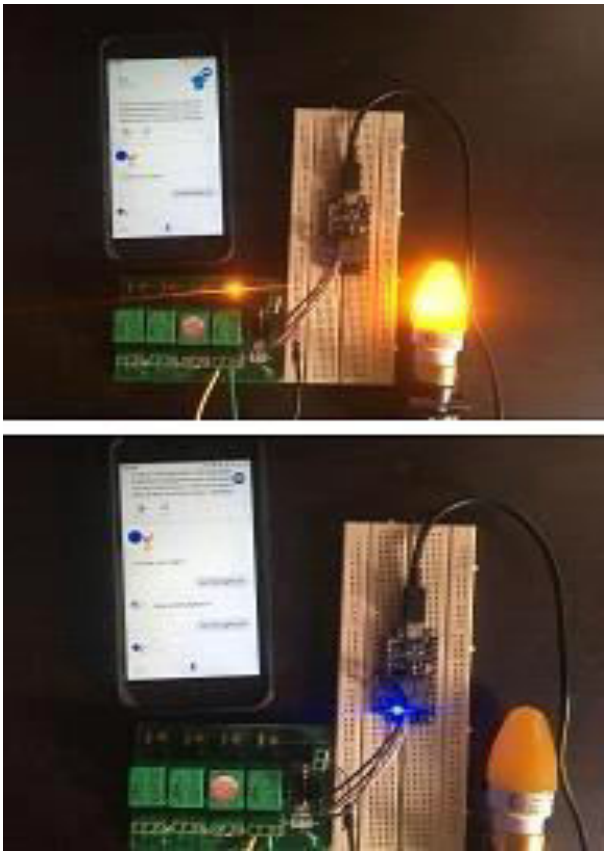


Fig -6: Light Turned ON and then OFF

3. CONCLUSION AND FUTUREWORK

The cause of this paper become to endorse a cost-powerful voice-controlled (Google Assistant) home automation. There has incredible growth inside the home automation gadget sector and lots of well-reputed businesses utilizing their possibility of paintings with IFTTT to deliver an elegant manner to connect families to their homes. This gadget is exceedingly reliable and efficient for the aged human beings and it's also very helpful to the otherwise abled character in a wheelchair who cannot reach the transfer for the switching ON/OFF the devices.

The future use for this project can be huge. There are many factors to improve on to make GACHA greater powerful, intelligent, scalable. For example, controlling the rate of lovers and lights. One can implement lots of their mission simply an unmarried command of voice instruction. We could make the gadget respond greater faster through our own non-public Blynk server. Well, no device is ever perfect. It always has some mistakes for improvement. One just needs to position on a thinking cap and try to make the system extra better.

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