IOT Based Smart Home Appliances

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Abstract- To enhance the lifestyle of people through the provision of different services, smart home or automated home comes into picture. The main objective of this project is to operate home devices smartly through an android app using IoT (Internet of Things). IoT is the network of "things" or physical objects which includes electronics, software, sensors, actuators and network connectivity. All these things collect and transfer data between themselves. IoT has increased significantly in the last few years since it has added a new dimension to the world of information and communication technologies. For digitalizing home appliances such as lighting, heating, security, audio, video etc. IoT in home automation is the best commercial solution these days. With the increasing use of personal computing, media players, android mobile phones etc. people have more knowledge about these technologies and are more comfortable with its use. Thus home automation will be easily accepted by the people.

Keywords- Nodemcu, Google Voice Assistance, Relay, Loads.

I. INTRODUCTION

Home, it is the place where one fancies or desires to be after a long tiring day. People come home exhausted after a long hard working day. Some are way too tired that they find it hard to move once they land on their couch, sofa or bed. So any small device/technology that would help them switch theirs lights on or off, or play their favorite music etc. on a go with their voice with the aid of their smart phones would make their home more comfortable. Moreover, it would be better if everything such as warming bath water and adjusting the room temperature were already done before they reach their home just by giving a voice command. So, when people would arrive home, they would find the room temperature, the bath water adjusted to their suitable preferences, and they could relax right away and feel cozier and rather, feel more homely. Human assistants like housekeepers were a way for millionaires to keep up their homes in the past. Even now when technology is handy enough only the well to do people of the society are blessed with these is new smart home devices, as these devices costs are a bit high. However, not everyone is wealthy enough to be able to afford a human assistant, or some smart home kit. Hence, the need for finding an inexpensive and smart assistant for normal families keeps growing.

II. EXISTING SYSTEM

In the existing system, home appliances are controlled through Bluetooth, Zigbee and other devices. But they are limited to certain area. In the proposed system we have designed so as to control home appliances from anywhere in the world.

DTMF can also be used but it won't come for practically and also not reliable.

III. PROPOSED SYSTEM

The idea of the project is to integrate the concept of Google Assistant into Nodemcu and control the appliances in the home that the device is installed. Google released an API for Google Assistant. This system works based on the Google Assistant. The device is first registered in the Cloud console of the users Google account. A sound is played to acknowledge that the Google assistant is up and running.
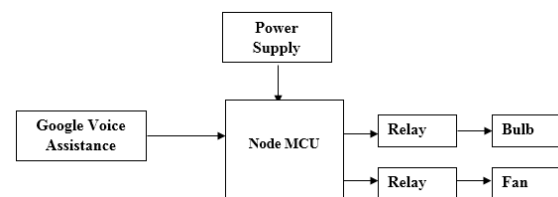
**Block Diagram**

Figure 1: Block Diagram

IV. HARDWARE REQUIREMENTS

NodeMCU:

Introduction to NodeMCU

NodeMCU is an open-source firmware and development kit that plays a vital role in designing your own IoT product using a few Lua script lines.Multiple GPIO

pins on the board allow you to connect the board with other peripherals and are capable of generating PWM, I2C, SPI, and UART serial communications.
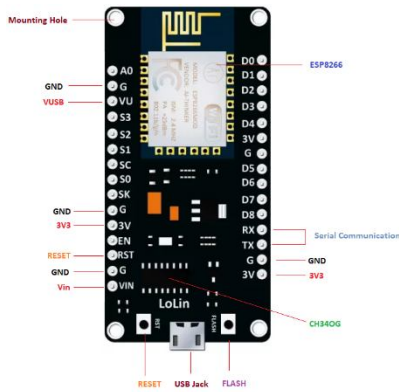

Fig2: Nodemcu

Power supply:

Power supply is converting AC to DC supply.

Components used in power supply:

Transformers:

This device consists of two electrically remote coils and operates on faraday's foremost of mutual induction, at some stage in that accomplice in nursing voltage is evoked a few of the transformers secondary coil through the magnetic flux generated by way of the voltages and currents flowing most of the coil winding.
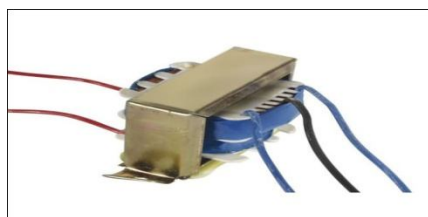
Figure 3: Transformer

Rectifier:

Rectifier is a component which is utilized to alter over AC voltage to DC voltage .There is two types. Half of wave and whole wave rectifiers.
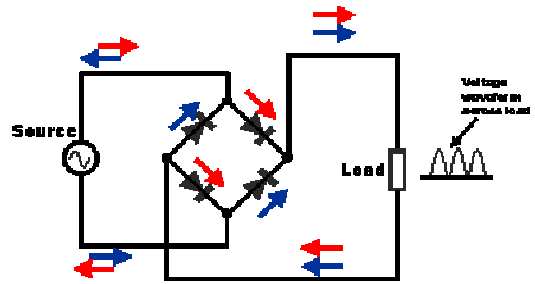


Figure 4: Rectifier circuit

Capacitors:

Capacitors are passive elements which stores energy in the form of electrical form and allow only AC components in circuit.

Figure 5: Capacitor

Voltage regulators:

Voltage regulators are used to maintain constant voltage in the circuit or stabilize the voltage. There are 78xx&79xx series are presented. In this 78 indicates positive and xx indicates output voltage.
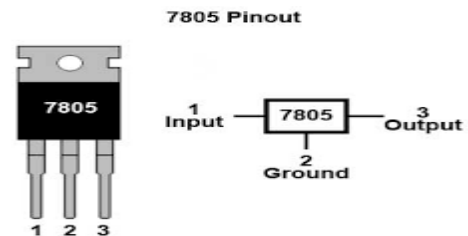
Figure 6: Regulator

Relay:

Relay is electromagnetic switch that open or close the switches electrically or electro mechanically. Relay is mostly used to switch smaller circuits.

Fig7: Relay

Google Assistant:

The "OK Google" or "Hey, Google" side covers voice commands, voice searching, and voice-activated device control, letting you do things like send messages, check appointments and so on on your Android device, just like Apple's Siri on an iPhone or iPad, but reaching far beyond that, with a bot-centric AI experience, designed to give you conversational interactions.

Fig8: Google Assistance Logo

V. SOFTWARE REQUIREMENTS

Arduino IDE:

The Arduino integrated development environment (IDE) is a cross-arrange application (for Windows, MACOS, and Linux) that is written in the programming language Java. The Arduino IDE supplies a programming library from the Wiring adventure, which gives various customary input and output.

Embedded C:

Implanted C utilizes KEIL IDE programming. The framework program written In Implanted C will be put away in microcontroller. The accompanying is a portion of the real explanations behind composing programs In C rather than get together. It is less demanding and less tedious to write in C then gathering. C is less demanding to change and refresh. You can utilize code accessible in capacity libraries. C code is compact to different microcontrollers with next to zero alteration. Genuine, Installed C programming need nonstandard expansions to the C driver so as to bolster fascinating components, for example, settled point number catching, numerous unmistakable memory banks, and fundamental I/O operations.

VI. WORKING OF THE PROJECT

The whole system is broken down into two main categories are as follows

1. The hardware-

It has the capability to connect to the router. It would also be able to turn on/off specified devices, such as lights and fans. It is called the "Control Unit". And the sensors and,

2. The Software-

The IFTTT app and the Google Assistant constitute the software of the design and these applications would be integrated in the Android device. When the user sends command through Google assistant it first goes to the IFTTT there we given set statements that states he IF THIS THEN THAT you can understand this when you see the architecture of the our system. From there it goes to the adafruit is cloud service it is like MQTT broker which interacts with the Node MCU. The Control Unit comprises of the microcontroller-Nodemcu and the Relay board. Android device communicates with the microcontroller and sends the desired signal via the internet.

So, when I use Google Assistant on my mobile and give voice command as "Ok Google, Turn LIGHT ON", applet created in IFTTT receive this command and will send data '1' to the Adafruit feed. This will trigger the event on Adafruit dashboard which is continuously monitored by the microcontroller (here Nodemcu). This microcontroller will take action as per the data change on the Adafruit dashboard.

VII. APPLICATIONS

- Used in homes, offices, industrial areas etc.,
- Control home electrical system using phone.
- Switch Module's outputs to directly drive loads like bulbs, Lamps, Sockets, Television, and Fans etc.
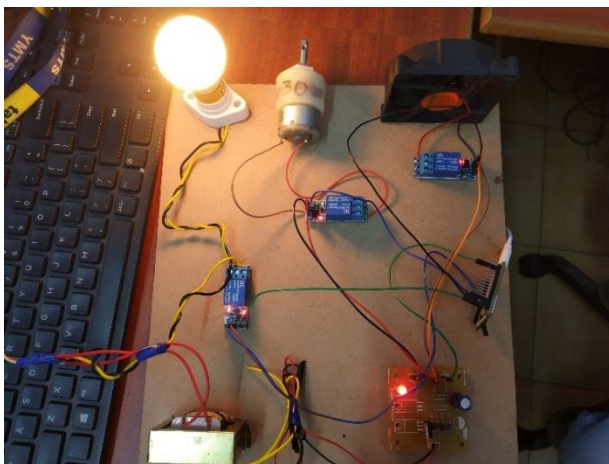
VIII. ADVANTAGES

- Smart and secure.
- Controlling home appliances from anywhere in the world.
- There is no need for extra training of that person who is using it.
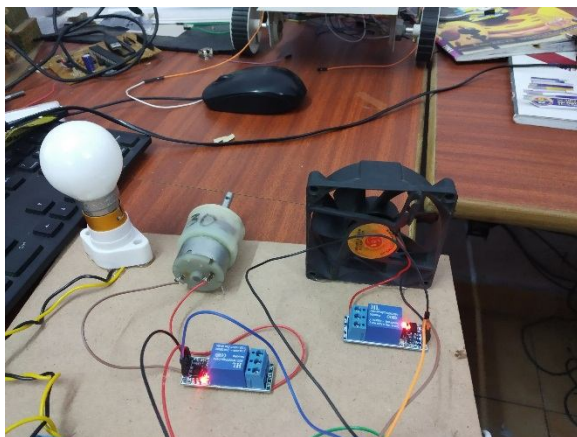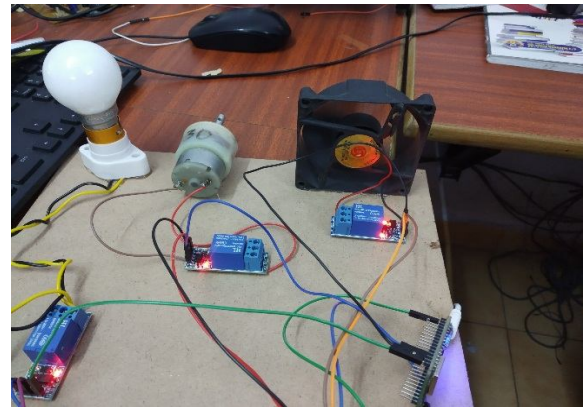- It is a robust and easy to use system.

IX. RESULTS
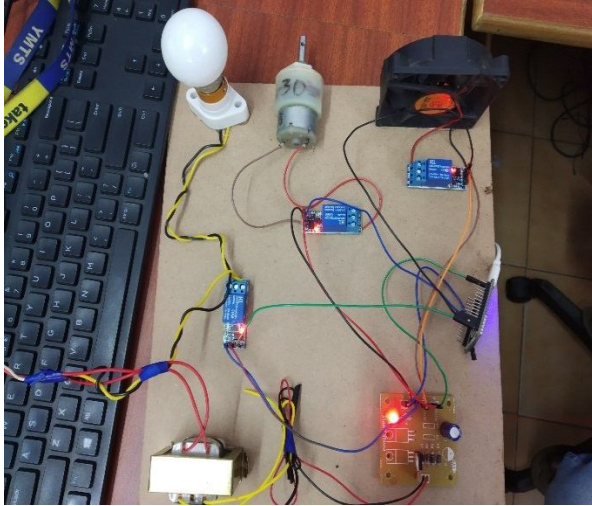
Fig9: When Light is OFF

Fig10:When Light is ON

Fig11: When Fan is OFF

Fig12: When Fan is ON

X. CONCLUSION

It is evident from this project work that an individual control home automation system can be cheaply made from low-cost locally available components and can be used to control multifarious home appliances ranging from the security lamps, the television to the air conditioning system and even the entire house lighting system. And better still, the components required are so small and few that they can be packaged into a small inconspicuous container. The designed home automation system was tested a number of times and certified to control different home appliances used in the lighting system, air conditioning system, home entertainment system and many more . Hence, this system is scalable and flexible.

XI. FUTURE SCOPE

Android app will also develop for easily use. In Android app there will be direct buttons for ON or OFF the system or to receive the OTP. For more security purpose camera module can also be implemented on the system. If any person attempt to enter in home with more than three time wrong password then at that time camera module will be activate. And camera module will capture the image of person who trying to attack on system. It can use antivirus so that hacking of the system can be difficult.

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