Internet of Things based Intelligent Light System for Smart Home

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Abstract-- **In today's world, Internet Of things plays a main part and role in the human's life such as security, safety, and time management. This helps in the automatic *recognition* of everything that is connected through internet. The main concept of this paper is that intelligent voice control lightening device based on Arduino UNO microcontroller. This will save lots of time and bring more convenience to life. While using this device we need to speak "Lights On" and "Lights Off". Using that Arduino will recognize and take control of the switch and work according to the voice. And at the same time, it also has the function on and off automatically after 10seconds. This will mainly reduce the fundamental work required in robotics, framework, human work, time, and reduce mistakes of human. The inheritance in this project is accessible in android market which is used to control gadgets at home.**

Keywords: IoT, Ultra Sonic Sensor, Arduino UNO, Blynk, Node MCU, Relay

I. INTRODUCTION

Voice controlling devices may offer people the pleasant life and a simple routine task. The purpose of this project is to ease the lights off handicapped, blind and paralyzed people by completing their task based on their voice commands. The innovative idea of our project is to convert speech of human into a home automation without any difficulties. The primary goal of project is to build proficiency and reduction. **'*Web of things*'** is the most recent approach in the upcoming IoT model. This is especially essential for innovation to encourage the human interface. This will reduce efficiency and save time of human. Mainly, this type of inventions will be perfectly suited for some of the impassive people who feel tough to work. This also helps the people who have worked hard in their respective office and return home will full of tired. They can just open the app on their mobile and say light "on" if need or else light "off". Even it is useful when they have forgotten to switch off the light they can use this. This provides more usefulness to the people. Voice Controller is proposed to proceed the way in

future that everything should be based on IoT and that the way of future IoT. The main work in this project is to enable and hear the voice "On " and "Off" from the human. This is mainly created because automation in IoT plays a major role in day-to-day life. This is also more secure because without knowing code no one can access this detector. We should further develop the automation for authenticated person to allow when that person speaks. This means if the voice of the recognized person is heard then it will perform the task. "Smart technology makes us Smart!!!"

II. RELATED WORKS

Dennis Brown Germiniasi da, Silveira Marlon José do Carmo are the authors who discussed about the voice recognition-based home automation system using android and Arduino, which is similar our proposed model. This had given us the idea to make the model to be more efficient with some renovative works and some of the modern effects. In this model, we use mobile apps and make ourselves more convenient as we often use our mobile phones for all reasons. Here, we connected the model with our phone[6]. Kumar, S., & Solanki, S are the authors discussed about the main use and importance of the touch and voice control automation. As we all are turning our city and country into smart city and country it is necessary for all of us to change or convert ourselves into smart by creating the awareness of using or promoting our home or house into smart home or house. From this article, we have accessed a thought of changing a voice controllable light automation using our mobile. Where this is similar to Alexa, an amazon product. In that we use an equipment here we use mobile app[9]. Shafeek, Lohith G, Ismail Mubharakh, Prof. Biju Balakrishnan are the authors who have discussed about the home automation system. In this era, there are many articles which are describing about the smart home automation system. Nowadays, many people are attracted by the smart home system where the automatic

switching on and off of the electricals and electronics, sliding furniture and so on. From this article, we have realised about the importance of the light switching system and that helped us to create our prototype model[4]. Mittal, Y., Toshniwal, P., Sharma, S @ all have discussed about the multi-functional system of the voice recogniser in the home. This is a new idea and model, everywhere can be executed with the great feedback. This article makes the technical development through the Internet using the Arduino, raspberry pi and etc. We can also make this as a great momentum change in our world through our ideas of IoT[1].

III. MATERIALS AND METHODS

We have made a creative and better method for the voice recognition system of light control. This is a simple and user-friendly method that can be run on the Android mobile. The entire architecture of this system is given below in Fig. 1.
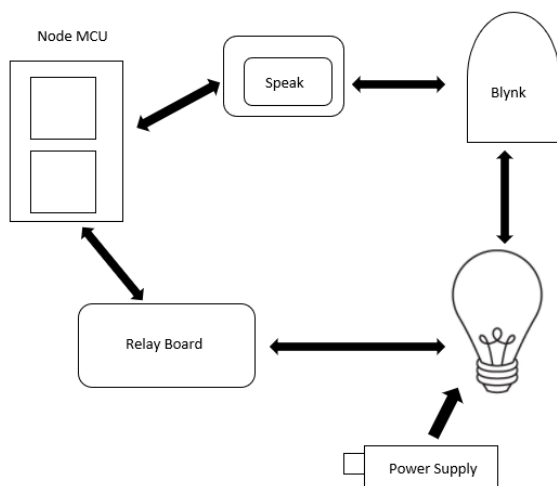

Fig. 1. Architecture of the proposed system

In this project, we have used Node MCU which is used to control the mission using internet, Relay to address or identify the specified voice of the people, MIT-App invertor to recognize voice using relay, Blynk App for internet connecting the code and execution and last these all the software and hardware are connected to the bulb using the wires. If the voice is heard through the MIT-App invertor, the current situation of the light is visible in the Blynk app, such as if the light is on it shows on or else vice-versa. Everything in this world is being dealt with technology and also now we have become sufficient with our available things. This project is based on the recognizer that make the light on and off using the relay, MIT-App and Blynk App. Our main aim in this project is to make the technology more efficient in a particular field and help the needy and poor people.

IV. PROCEDURE

A. Node MCU Connection

Node MCU is actually used to control the wi-fi settings remotely without using any physical content. It has 10 digital pins and one analog pin where it is being grounded and Vcc is connected between the Node MCU and relay board.

B. Relay Board Connection

Relay board has the secondary connection which is connected to the D2 pin in the bulb and it is grounded with the Node MCU. These connections are made using the jumper wires.

C. MIT-APP Invertor Connection

This app has some inbuild connections, where we have to scan the QR code for the specified connection of the system code. When this is being done properly the mobile version of the particular app is opened for the conversation between the app and the microphone.

D. Blynk App:

This app act as the cloud network for the system. Here, the code of the particular project is coded and executed. Then it is connected with the MIT-App invertor for the recognition of the voice using the relay code.

V. BLOCK DIAGRAM

Node MCU esp8266 is the most important equipment in this project that is connected to the relay for the concept of accepting the recognition of the voice with the help of the internet. The other components of this model are relay, jumper wires and battery. The apps we have used in this model is Blynk and MIT-App inventor 2. Here, the Node MCU, Relay, MIT-App invertor are connected to their respective pins. Then these are connected via code to the Blynk app and MIT-App inventor and it is executed. The block diagram of this project is given below in Fig.2.
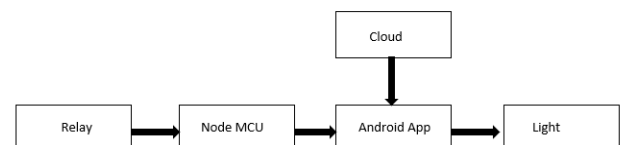

Fig.2. Functional Block Diagram of Proposed System

This System makes us to realize the efficiency of using the mobile phones in a useful way. Nowadays, children use mobile phones for playing, chatting and so on. Now, the mobile phones are also can be used in the efficient manner for using technical works. This makes the children to learn more about technology instead of wasting their time in playing online games.

VI. WORKING

After setting up the setup, i.e., Connecting the wires to the voice enabled light controller, now it is very important to check the connections are right or wrong by executing it. Second step is to make the requirements get ready for the project by connecting all the required apps to it. Third step is to make code to be executed in the Blynk app. Now, using the MIT-App invertor, we can speak the lights on or off and the specified instruction is visible in the Blynk App with a highlight.

VII.   IMPLEMENTATION

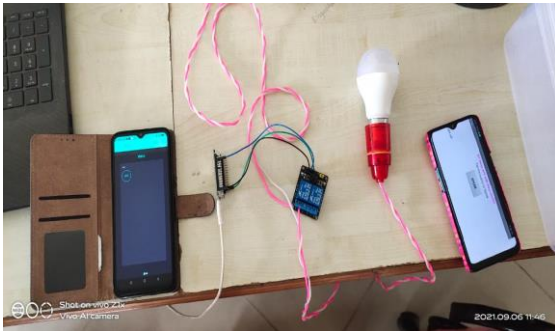The implemented part of the Voice enabled light controller is shown below:
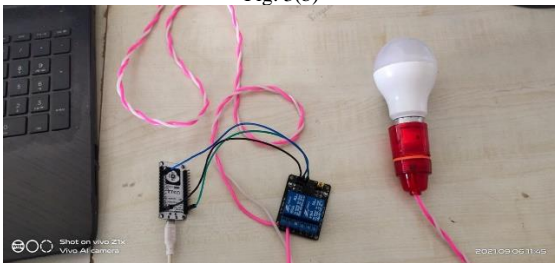

Fig. 3(a)

Fig. 3(b)

Fig. 3(c)

Fig. 3(a) represents the actual model of the voice enabled light controlled and this is the model kept before the execution. Fig. 3(b) represents the lights on. When the voice is recognized by the app through microphone the execution takes place according to the code and the voice spoken is also displayed there. Fig. 3(c) represents the light off. The same procedure for the above figure is taken place here.

VIII.   DISCUSSION

In this model, we have discussed only about the voice recognized light controller. This is just the beginning era for the technology. In this era, itself it has reached the peak of its' level and also further being developed. Later on, we just like to enhance this project by adding some specific features such as not only the on and off of the light but also locking of the door, switching on and off of the fan, ac, and so on. We would like to work on this so that it may helpful for us to learn more about the Internet of Things.

CONCLUSION

This system is prepared for future task and probably the key element for this is to design a voice detector for light controller in anywhere. The size of this proposed model is very low and the speed of this device is extremely high. The resulting ask is particularly robust in the use case with all purpose for home automation. This design principle make it possible in small devices with high efficiency. In this model, we use Arduino sound detector switch, etc., This project is only for making human work easy and especially for aged person because some cannot walk a distance and on the lights, so they can on while sitting. This make very useful for them In future, for automation will surely bring a great change and thus there comes future environment.

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