A Survey on Home Automation by Using Voice Command Based on IOT

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Abstract- *This paper presents a home automation controlled by using Google Assistant system. Now present day most advancement of Automation technologies that makes humans life is simpler and easier in all aspects. In present world the automatically devices are used over manually by iot. The wireless technology can operate anywhere in the world by using the iot, an automated home is called a smart based home. It saves the electricity and manpower. In this work the paper shows designs diagram and prototype of the automatic Home controlled system. The main device is Node MCU has inbuilt Wi-Fi module, that's why it will help to control devices over the internet. Iot is main objective to control all over the internet. The automation means the control devices or system automatic with less human helps or efforts.Today the wireless technology is growing fast day by day. Now a day, wireless technology plays most important role in automation technology. It means the automation makes the technology free from human interruption. Home automation is one of the technologies emerging these days. This work can use in home appliances like lights, fan, TV, college, school, and labs. It also provides better security and good surveillance by using this technology.*

Keywords- IFTTT (If This Than That) Application, BLYNK Application, Internet of Things, Google Assistant, Voice Control, Smartphone, NodeMCU (ESP8266, relay.

I. INTRODUCTION

The full form of iot is the internet of thing. In home the iot is very useful to use. The iot described the inter connection an objects like smart mobiles, PDAs, smart TVs, and sensors to the Internet where the devices are linked to get communicate with people and between themselves. Home automation is also named as domestics or Smart home. It involves the control and automation of lighting, air conditioning and security, as well as home appliances. Wi-Fi is used for to control the home appliances by using the remote monitoring. When it is completely remotely monitored and controlled via Internet is a part of Internet of things. Every day modern people expect a new device and new technology to simplify their day to day life easy and better. That's why the developers and researchers are always trying to find new things to provide comfort to the people. so any small device/technology that will help there switches to turn the lights on or off, or play their favourite music and TVs etc. by using the smartphone to make their home comfortable through given voice command. It uses the Google Assistant, the IFTTT application, the Blynk application and the Node MCU along with ULN 2803 IC. Natural language voice is used to give commands to the Google Assistant. After that voice command all devices and technology can be worked automatically. All of the components are connected over the internet using Wi-Fi which puts this system under the IoT.

II. LITERATURE SURVEY

In the present situation the people always think about home automation to control all devices or system automatically. By using this application it will control by one remote to all domestic appliances. In the household appliances like refrigerator, air conditioner, water heater, television, and fan etc. that all devices can controlled by automatically by using this application. That makes home automation to smart home automation. It will make the easy life. N. Sriskanthan explained the model for home automation using Bluetooth via PC. But unfortunately the system lacks to support mobile technology [5].Tan, Lee and Soh (2002) proposed the development of an Internet-based system to allow monitoring of important process variables from a distributed control system (DCS) [1]. This paper proposes hardware and software design considerations which enable the user to access the process variables on the DCS, remotely and effectively rent designations. Potamitis, Georgila, Fakotakis, and Kokkinoss, G. (2003) suggested the use of speech to interact remotely with the home appliances to perform a particular action on behalf of the user. The approach is inclined for people with disability to perform real-life operations at home by directing appliances through speech. Voice separation strategy is selected to take appropriate decision by speech recognition. In the year 2006, S. M. Anamul Haque,S. M. Kamruzzaman and Md. Ashraful Islam proposed a system entitled "A System for Smart-Home Control of Appliances Based on Time and Speech Interaction" that controls the home appliances using

the personal computer. This system is developed by using the Visual Basic 6.0 as programming language and Microsoft voice engine tools for speech recognition purpose. Appliances can be either controlled by timer or by voice command.

III. SYSTEM DIAGRAM AND IMPLEMENTATION

Fig.1. shows the block diagram of Google assistance based home automation. It contain controlling device which is connected with the Wi-Fi module. It contains android devices with some applications and control unit which has node MCU and relay driver. This module will be connected with the microcontroller .The operator and controller will give the required command to the relay board. The relay board acts as switch between the circuits. The external devices are connected to the relay board. And these devices can be controlled over the internet of thing.

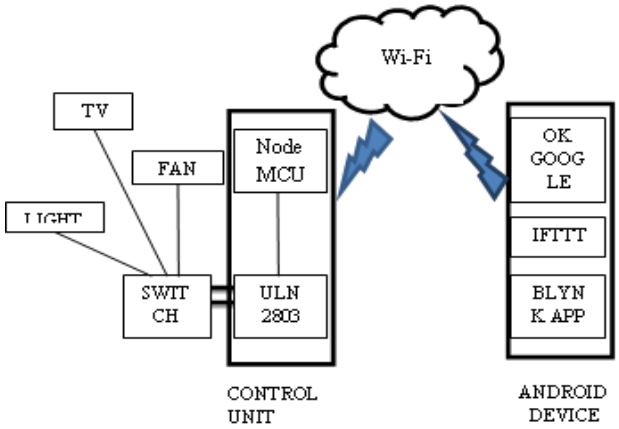

Figure 1:Block diagram of Google assistance controlled Home Automation

3.1NodeMCU (ESP8266)

The node MCU is a low cost Wi-Fi chip with full TCP/IP protocol stack and microcontroller unit. It is a small module which is easy to handle and easy to construct. This module allows microcontroller to connect to a Wi-Fi network and make simple TCP/IP connection using Hayes style commands, The ESP8266 with 1MiB of built in flash, allowing for single chip device capable of connecting to Wi-Fi. Fig.2 shows the device of node MCU. The Node MCU (Node Microcontroller Unit) is open source software and hardware development environment that is built around a very inexpensive System-on-a-Chip (SoC) called the ESP8266. The node MCU (ESP8266) is designed and manufactured by Express contains all conclusive elements of the modern computer: CPU, RAM, networking (Wi-Fi), and even a modern operating system and SDK.

Figure2.NodeMCU (ESP8266)

3.2ULN 2803 IC (Relay Driver)

Relay is electromagnetic switch. It is electrically operated switch. Different types of relay use an electromagnetic to mechanically operate as a switch. It is used where it is needed to controlling the circuit by a separate low power signal, or where several circuits must be controlled by one signal. It is used to turn the system on and off.In this system, the relay is used to turn ON/OFF the appliances. The signal is supplied from the Node MCU microcontroller may be high/low. Relay calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power system these functions are performed by digital instruments still called “protective relay”.

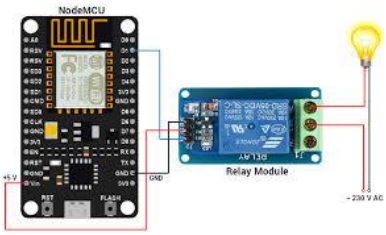

Figure3.Relay Board

Fig.3 shows circuit diagram of relay board. Most of the Chips operates with low level signals such as TTL, CMOS, PMOS, and NMOS which operates at the range of (0-5) V and are incapable to drive high power inductive loads.

IV. SOFTWARE

It contains the Blynk Application and the IFTTT application.

4.1 Blynk Application

Blynk is Android apps to control Arduino, Raspberry Pi, NodeMCU and several other boards all over the Internet. Fig.4 shows the Functioning of the Blynk Application. It was designed for the Internet of Things. It can control hardware remotely, it can display sensor data, and it can store data, visualize it and do many other cool things. Its setup is required

as per the requirement. After which we create the toggle buttons for each relay associated with the digital pins of the microcontroller. Once this is done, it sends an authentication token to the registered email id for this particular project. This token should be noted and saved for its use while programming the NodeMCU and setting up the IFTTT application.We can use the Blynk Cloud or run private Blynk server. Its open-source, could easily handle thousands of devices. Now imagine every time we press a Button in the Blynk app, the message travels to the Blynk Cloud, where it will find its way to our hardware.

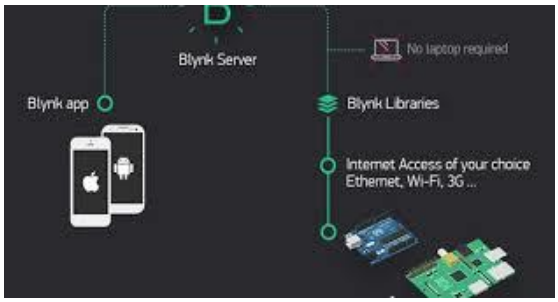

Figure 4. Functioning of the Blynk Application

4.2 IFTTT Application

IFTTT stands form "if this, then that". IFTTT is both a website and a mobile app. The IFTTT can be used to automotive everything from your favourite apps and websites to app-enabled accessories and smart devices. Fig.5shows the Screenshot of the IFTTT Application after Creating Several Applets. The company provides a software platform that connects apps, devices and services from different developers in order to trigger one or more automations involving those apps, devices and services. Here, IFTTT application is used to bridge the gap between the Google Assistant commands and the Blynk app. The response command from the Goggle Assistant can also be typed in as desired. This is decided by setting "That" of the app. We click "That" and then select web hooksand click connects. Web hooks will allow us to send commands to the Blynk Server.

Figure5. Screenshot of the IFTTT Application after Creating Several Applets

4.3 Google Assistant

The Google Assistant is software which allows the users to control the all apps in their device by using voice commanding mode. It allows the users to control and command most of the apps in their devices using voice commands. This provides more convenience to the people as they only have to command the Google assistant thorough voice command.

V. CONCLUSION AND FUTURE WORK

A. Conclusions**:**

In this paper, the architecture are low cost and flexible home Automation system using advanced version of Arduino microcontroller is proposed and implemented. Overall Arduino is easy to understand & its coding is easy. By implementing this type of system we can ensure that the energy conservation can be done. It will increase the efficiency of this application. We control the entire home appliance over the internet. This will Increase the comfort ability of human being and it will reduce the Human efforts.

B. Future work:

The future scope for Google assistance based home automation can be big and so many. In many factors that improve to make Google assistance based home automation more powerful, intelligent, scalable, and to become better overall for home automation. For example, controlling the speed of the fan, more number of devices can be integrated, like a coffee machine, air conditioner etc.

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