CONTROLLING HOME APPLIANCES USING GOOGLE ASSISTANT

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ABSTRACT

The purpose of this research paper is to present how we can control our Home Appliances using Google Assistant present in our Smartphone. There are other Devices such as Google Home which cost around (Rs.9399/-) and Google Mini, Alexa etc. which can be used for home automation, but it cost way too more for people like us where we can't afford to spend that much amount of money for this purpose. This Research paper will help to know which are the existing methodology present which is easy and affordable to implement. The mainreason for this research paper is to identify the existing technologies present, how they have been implemented and what are the future enhancement should be implemented are highlighted. Also, these technologies will make life easier by automating the home appliances.

KEYWORDS : *Google Assistant, Voice Recognition, Node MCU, Raspberry Pi, Arduino, Home Automation.*

1. INTRODUCTION

Nowadays the use of IOT has been increased everywhere. With the help of IOT, we are able to work with many devices integrate them and automate the entire process. As traditionally we did not have an automated home and to have it also it used to be expensive for people like us to have the facility at our place. This paper proposes such an inexpensive system which will allow us to have control over the devices remotely with their voice with the aid of their smartphones would make their home more comfortable. In this control and automation of lighting, heating, air-condition as well as home appliances. Remote monitoring is usually done with the help of Wi-Fi.

Home devices, when remotely monitored and controlled through the Internet is a part of IOT. As the demand is increasing for electricity and to save that we can use the technology by turning off the devices remotely. Implementation of IOT has been increased in almost every field and now-a-days the use of IOT has changed the way of living. The objective of the paper is to understand the implementation of IOT in building smart home at very cheaper rate. The devices available in market cannot be used by everyone due to its cost. So with this paper we will be able to explore the ways through which we can implement the IOT in our home to make it smart and with the minimum cost to implement it.

2. LITERATURE SURVEY

The idea of this is to integrate the concept of Google Assistant with other devices and control the appliances in the home that the device is installed. The analysis is done after referring to various previous papers which have already given implementation for this purpose. The idea behind this paper is to analyze various methodologies and choose the optimum form them. The following previous papers reference:

2.1 Google Assistant Controlled Home Automation by Manish Prakash Gupta[1], has used hardware such as NodeMCU (ESP8266), Relay Board, ULN 2803 IC and software such as Blynk Application, IFTTT Application in this project. The hardware also called as Control Unit consists of NodeMCU microcontroller and the Relay board. NodeMCU digital output pins are connected to relay pins of the Relay board. And each one of the Relay is connected straight to the appliance.

Blynk is an application supports both iOS and Android devices to control Arduino, Raspberry Pi, NodeMCU and several other boards over the Internet. With the help of Blynk App, we can control the hardware remotely which is used in the project. It is used to display, store, and visualize data. In this, we first create the project and select the microcontroller once we have downloaded and registered on the Blynk App. After this, we will create toggle buttons for the relay.

IFTTT Application stands for If This Then That helps to bridge the gap between the Google Assistant commands and the Blynk App. In this, we create an applet for a different purpose and

accordingly the commands are written to which the Google assistant will respond and will complete the action.

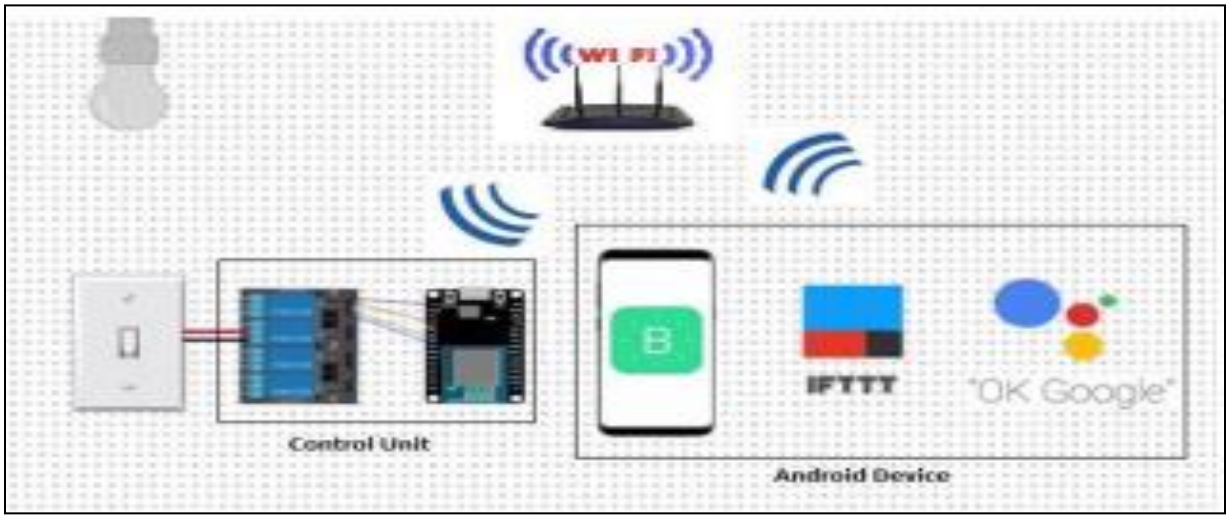


Fig. 1: Connectivity of devices using IFTTT and Blink Application.

2.2 Interactive Home Automation System with Google Assistant by Mummaka Sai Srinath, Manepalli Nanda Kishore, M.D. AntoPraveena [2], has used components

Such as Raspberry Pi 3, USB Microphone, Google Assistant SDK, LED lights.

USB Microphone: The USB microphone allows listening to the voice command to the device. This is an external one as the raspberry pi does not have the microphone.

Google Assistant SDK: The Google Assistant API has to be enabled in the cloud console of the user's Google account. Once the Google assistant is active the commands received by it is being processed in Google cloud providing the desired outcome.

LED lights: The LED lights will help to understand the working as it will on/off according to the command given.

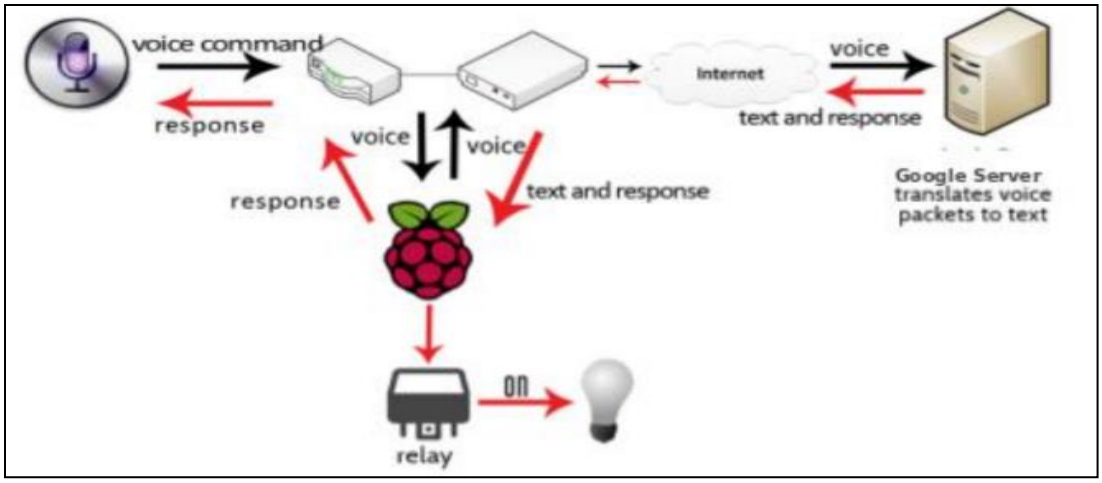
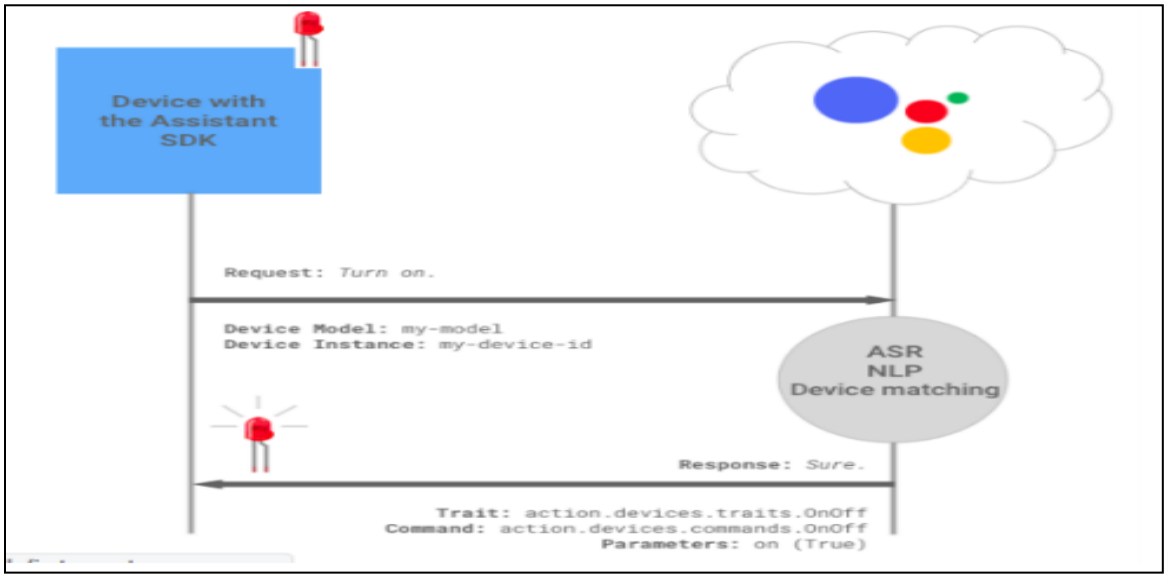


Fig. 2: Complete Process of controlling home appliances usng voice command.

In a nutshell, here the Author has downloaded Google Assistant SDK in the raspberry pie so there is no external device such as Google home, Alexa or android, IOS device to enable voice command, the Raspberry Pie itself consists of Google Assistant which uses the external microphone installed on it. In order to wake up, the user has to use the hot word such as "Hey Google" or "Ok Google" once the device detected the keyword it will wake up and ready to listen to the command, by which user can order the Google Assistant to switch off or switch off the device



[2]

Fig.3: Connectivity using Google Assistant SDK.

2.3 Design of an Intelligent Voice Controlled Home Automation System by Sonali Sen, ShamikChakrabarty, RaghavToshniwal,AnkitaBhaumik[3] has used components such as

- Android-based phone,
- Bluetooth module,
- Arduino Uno,
- Relay boards.

The author has developed a custom application for controlling the appliances using the internal voice recognizer which is an inbuilt feature of Android phones.

An **Android-based phone** is used through which the user will interact by giving the voice command and according to the command will be processed and the desired output will be given. As the android has the inbuilt voice recognizer feature through which the commands can be given.

The Author has used the **Bluetooth module HC-05** module for connecting the Android device to the Arduino through Bluetooth. It is a Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Serial port has a data rate of 3 Mbps and Modulation of the 2.4GHz radio transceiver and baseband.

Arduino is an open-source electronic tool used for building electronics projects. Arduino consists of both the physical programmable circuit board and software IDE that runs on a computer used to write instructions and upload it into the Arduino board to do the desired job.

The below image describes how the process is implemented by the author in reference [3]

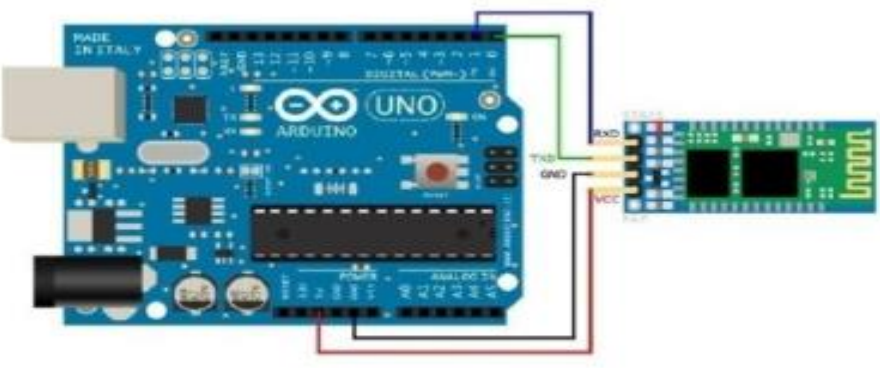


Figure 3: HC-05 connectivity with Atmega328p

A **Relay** is an electromagnetic switch. In this project, the author has used the relay circuit to switch on/off the appliances. The corresponding high or low signal is supplied through the Arduino Uno microcontroller. When a low voltage is a pass to the relay of an appliance then the appliance it is turned off and when a high voltage is given then the appliance it is turned on.

In short, when the user passes a voice command using the custom application the android phone converts the voice into the text form then the text data is transferred over the Bluetooth to the Bluetooth module HC-05 module which is connected to the Arduino then the Arduino perform the corresponding operation of user desire.

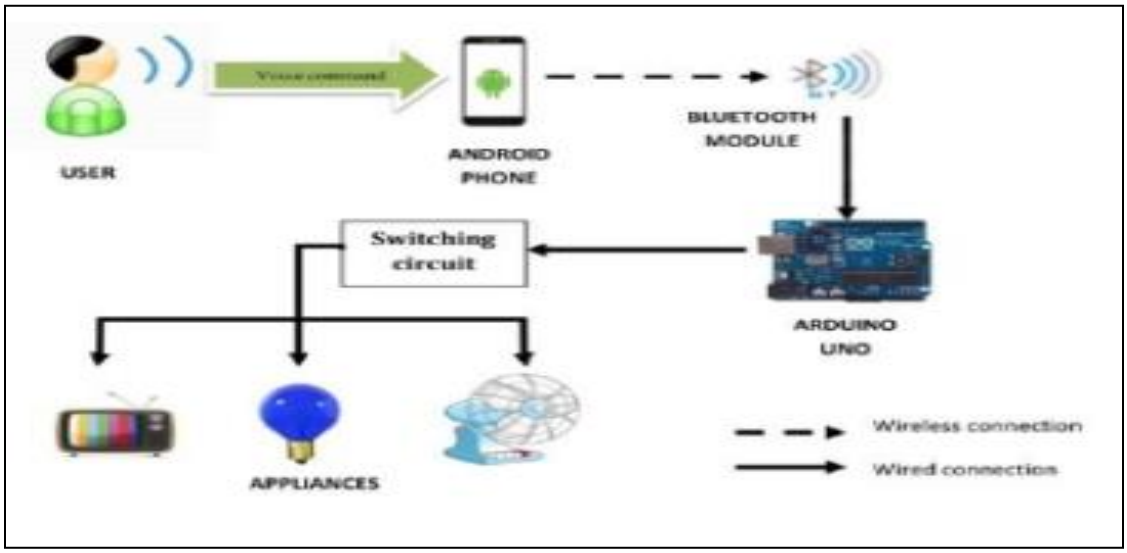


Fig. 4: Connectivity with Atmega328p.

3. CONCLUSION

The above various ways of implementing the idea are different from each other as it uses different devices which have advantages and limitations as well. The above methods help to have the devices automated at a very cheap price and are easy to implement but as of now the implementation done in all the papers require basic knowledge about the hardware and software which is used to implement the system. This can be replaced further with some more modification with the product which can be simply plugged in and can be used. The product can be purchased from the store and can be used without having knowledge about the devices and

need not to assemble the hardware and software together. The product can be used without support from professionals. This will make life much easier without having to dirty hands with the devices, connections and doing programming into it.

4. FUTURE ENHANCEMENTS

In Future Enhancement, we can also attach smart motion sensor attach to the Arduino or Raspberry Pie through which the Google assistant get to know whether there is someone in the room or not and based on that all the appliances such as fan, lights, Air condition, Heater etc will be shut down automatically. although this kind of technology already present but here the Google assistant plays an important role for the appliances by using the data gathered from the smart sensors, where else other technologies don't use the Google Assistant.

Next Future enhancement we can do is, instead of a limited area network (Wi-Fi) this service can be hosted over the internet where the user can control the Home Appliances from any place whether he's in an office or out of the town, but the question here is why the user needs to control his home appliances from another place, there are certain circumstances or condition where user may need to control his home appliances, some of the reasons are listed below,

1) The user may forget to switch the fan, light, Air Conditioner, heater etc while in hurry going out.

2)The user may want to switch on his Geyser while going back home after so much of work so that he can take bath without waiting after reaching home same with Air Conditioner, Room Heater.

5. REFERENCES

[1] Google Assistant Controlled Home Automation Manish Prakash Gupta M.Tech. Student, International Research Journal of Engineering and Technology (IRJET).

[2] Interactive Home Automation System With Google Assistant, Mummaka Sai Srinath, Manepalli Nanda Kishore, M.D. Anto Praveena.

[3] Design of an Intelligent Voice Controlled Home Automation System Sonali Sen, Shamik Chakrabarty, Raghav Toshniwal, Ankita Bhaumik.