IOT BASED HOME AUTOMATION USING GOOGLE ASSISTANT AND IFTTT PROTOCOLS

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Abstract -The idea behind Google assistant-controlled Home automation is to control home devices with voice. In this project, the Google assistant requires voice commands. Blynk account which is a cloud based free IoT web server used to create virtual switches, is linking to IFTTT website abbreviated as "If This Than That" which is used to create if else conditional statements. The voice commands for Google assistant have been added through IFTTT website. In this home automation, as the user gives commands to the Google assistant, Home appliances like Light, plug etc., can be controlled accordingly. The commands given through the Google assistant are decoded and then sent to the microcontroller, the microcontroller in turn control the relays connected to it. The device connected to the respective relay can be turned On or OFF as per the users request to the Google Assistant. The microcontroller used is NodeMCU (ESP8266) and the communication between the microcontroller and the application is established via Wi-Fi (Internet).

Key Words:Smart home, Blynk, IFTTT, NodeMCU, Voice Control.

1.INTRODUCTION

"Home automation" refers to the automatic and electronic control of household features, activities, and appliances. The utilities and features of our home can be easily controlled via Internet. There are three main elements of a home automation system: sensors, controllers, and actuators.

The major concept using in the Google assistant-controlled Home automation is the Internet of Things. The Internet of Things (IoT) can be connecting various types of objects like smart phones, personal computer and tablets to the internet, which brings new-fangled type of communication between things and things, and things and people.

Any man-made objects that can be assigned an IP address and it has the ability to transfer data successfully over a network, the interaction through a network is called IoT. The internet helps us to bring immediate solutions for many problems and able to connect from any of the remote places. The Internets of Things technology is used to come in with innovative idea and large development space for smart homes to improve the living standards of life. The growth of the Internet of Things will reform a number of sectors, like healthcare, automation energy, transportation, etc. The cloud computing can be used in such case to implement the IoT infrastructure that augmented with sensors and actuators to monitor and control "things" from anywhere.

2. LITERATURE SURVEY

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). It 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 the voice command. Jawarkar, Ahmed, Ladhake, and Thakare (2008) propose remote monitoring through mobile phone involving the use of spoken commands. The spoken commands are generated and sent in the form of text SMS to the control system and then the microcontroller on the basis of SMS takes a decision of a particular task. Prof. Era Johri in (2001) have

successfully completed the project on "Remote Controlled Home Automation". Withings is a consumer electronics company is the leader in the connected health revolution. The Home camera alerts the user to many motion or noise while out of the House. It also tracks the indoor air quality, notifying the user if dangerous levels of voltaic organic compounds are detected. It has taken security, privacy and home health to the next level through a partnership with IFTTT, a service that allows rule-based actions and triggers between a range of devices and services. Users can enhance their Withings Home, a HD security camera equipped with environmental sensors, by connecting with IFTTT app to make household automation a reality. Withings Home is one of the most comprehensive home monitoring solutions on the market, allowing users to stay connected to their home and family from anywhere. The camera can be used with the IFTTT app to create a number of recipes between connected services and the camera, such as turning it on when user's phone is using geolocation or when the door is locked, or making it turn on the air purifier when bad quality is detected. Parents can take comfort in having superior features such as Baby Monitor Mode, which has continuous monitoring, alerts and interactive push-to-talk One of the topics which is gaining popularity of Home Automation System is because of its innumerous advantages. Home automation refers to the monitoring and controlling of home appliances remotely. with the never-ending growth of the Internet and its applications, there is much potential and scope for remote access and control and monitoring of such network enabled appliances. The effort targeted on the home automation concept of where the controlling and monitoring operations are expediting through smart devices. Wide-ranging home automation systems and technologies considered in review with central controller based (Arduino or Raspberry pi), cloud-based, Bluetooth-based, SMS based, ZigBee based, mobile-based, RF Module based, web based and the Internet with performance. One of the most important Hardware requirements of the project is Node Microcontroller. To understand more about it, one must know about Microprocessors and Microcontrollers and also the differences between them.

3. PROPOSED SYSTEM

The proposed system eliminates the complication of wiring in case of wired automation. Considerable amount of power supply is also possible. Operating range is more than the Bluetooth. The existing system does not allow remote monitoring and controlling of appliances. But where as in the proposed system the system using the Wi-Fi based home automation system it allows to monitor and control the appliances. The home automation of the existing system in 1990's, the people in every home has electronic devices which are controlled manually but in our proposed system we are controlling all electronic appliances through remotely using google assistant and Blynk. The IOT application have become this popular in this 21st century is due to dominant use of the internet, evolution of smart phone technology and raised standard of mobile communication to an upper level.

3.1 Methodology

The methodology of this project design includes implementation of the proposed method. There are some basic steps involving in the Methodology of the product. The first major step is setting up the Blynk. Blynk is a mobile application used to create virtual switches which will be turned ON or OFF depending on the commands given to the Google assistant and the second step is connecting the ESP8266 and the last step is connecting to Google assistant through IFTTT. IFTTT is also a website used to create simple chain of conditional statements for like if else statements. By following these three steps, the implementation of the proposed system is going to be done.

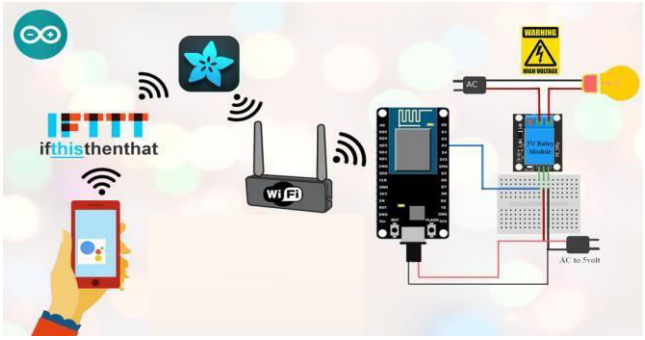

Figure 1: Block diagram of Google assistant-controlled Home automation

We start from programming the NodeMCU, we write a code that connect the Wi-Fi module with the nearby Wi-Fi and provide a verification token that we get from the Blynk application. Now we can login into the Blynk and from the widget we can create buttons that we are going to automate using the google assistant.

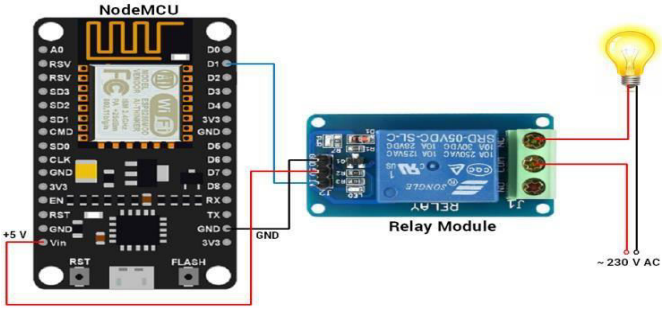

Figure 2: Interfacing Diagram of NodeMCU (ESP8266) with Relay module

After configuring the buttons we now have to set the triggers in the IFTTT to embed the Blynk and the google assistant so that if we say that particular phrase the following trigger executes.

3.2 Problems resolved using Home automation devices

Firstly, Home Automation will save time in daily recursive activities like turning of lights, geysers and other home appliances. Users don't need to think about whether the lights are turned off or did geyser or AC turn off or not while they are in office. Users can sit anywhere in the globe access our home away from home.

Secondly, security, users can secure their home while they are away from home. There are devices which keep monitoring the home and notify them when any incident occurs. The notification can be a simple SMS or a voice call which can alert and take necessary action. These devices can also run on Batteries. So need not worry about even when electricity is turned off.

Thirdly, Convenience, users don't need to manually go-to each and every room to see if any light or fan is switched on and turn off, instead they can on/ off all lights in a room or entire home. Users will have the convenience of controlling devices through smart phone or tablet.

The next one is Safety, in every home, situation arise when parents have to leave outstation and kids stay alone at home. In this scenario, Automation helps in securing kids' safety. One can install surveillance cameras and keep monitoring through mobile from anywhere in the globe. Also, there are devices which won't allow to unlock the main door from outside once it is locked from inside. Also, Sensors can be placed outside which can turn on light automatically in the night if someone try to intrude into home. These are the main problems resolve using the Home automation devices. There are many more benefits from Home Automation

3. CONCLUSIONS

There has been tremendous growth in the home automation sector, and many reputed companies utilizing their opportunity to work with IFTTT to deliver an elegant way to connect families to their homes. Consumers are looking to secure their home environment in today's unpredictable world, and the new Home automation service gives them the peace of mind that they need to protect their family's well-being.

This project is about wireless home automation using Android mobile helps us to implement such a fantastic system in our home at a very reasonable price using cost-effective devices. Thus, it overcomes many problems like costs, inflexibility, security etc. In addition, will provide greater advantages like it decrease our energy costs, it improves home security. In addition, it is very convenient to use and will improve the comfort of our home. The project has proposed the idea of smart homes that can support a lot of home automation systems.

REFERENCES

1. Tan, Lee and Soh – "Internet based Monitoring of Distributed Control Systems", - Energy and power Engineering. Publisher: IEEE Transactions on Education, Place: New Jersey, Country: USA, Year: 2002, Vol: 45, Iss. No. 2., pp. 128-134.

2. Potamitis, I., Georgila, K. Fakotakis, N., & Kokkinakis, G – 'An Integrated system for smart home control of appliances based on remote speech interaction',- 8th European conference on speech and communication technology, Publisher: World Journal control science and Engineering, Place: Geneva, Country: Switzerland, Year: 2003, Vol. No: 2, Iss. No.1, pp. 2197-2200.

3. S. M. Anamul Haque, S. M. Kamruzzaman and Md. Ashraful Islam – 'A System for Smart Home Control of Appliances Based on Time and Speech Interaction', - Proceedings of 4th International Conference on Electrical Engineering, Place: Bhubaneshwar, Country: India, Year:2006., pp.128 to 131.

4. N. P Jawarkar, V. Ahmed, S.A. Ladhake, and R. D Thakare – 'Microcontroller based Remote monitoring using mobile phone through spoken commands', - Journal of networks, Publisher: World Journal control science and engineering, Place: Lagos, Country: Nigeria, Year:2008, Vol.
No.:3, Iss. No.2, pp.58 to 83.

BIOGRAPHIES

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