

Home automation using Google assistant

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Abstract – Home automation is a important aspect we will have in future so here we are designing a simple home automation System in low cost so that we can help in changing the old technology of manual switches. This technology costs so badly in today's world around 2000rs to 5000rs so we have made some small adjustments and used it with google assistant which gets a significant reduction in cost of the home automation. we can interact with Google assistant and it can search on internet, schedule events, set alarms, control appliances, etc. This service is available on smart phones with Google Assistant and it is free to use. our project hardly costs 1000rs for 4 manual switches I hope everyone will like it.

Keywords- Home automation, google assistant, artificial intelligence,IoT

I. INTRODUCTION

Google assistant is AI (Artificial Intelligence) based voice command service. Using voice, we can interact with Google assistant and it can search on internet, schedule events, set alarms, control appliances, etc. This service is available on smart phones and Google Home devices. We can control smart home devices including lights, switches, fans and thermostats using our Google Assistant. I build an application which can control home appliances. Here, I control 60 W bulb using Google Assistant service. This application includes Google assistant along with Adafruit server and IFTTT service. Google assistant is AI (Artificial Intelligence) based voice command service powered by Google. Using voice or written commands, we can interact with Google assistant and it can search on internet, schedule events, set alarms, control appliances, etc. This service is available on smart phones with Google Assistant in android and siri in apple and Google Home devices. We can control smart home devices including lights, switches, fans and thermostats using our Google Assistant .I build an application which can control home appliances. Here, I am trying to control 5WLED Bulb using Google Assistant service. This application includes Google assistant along with Ad fruit server and IFTTT service.

II. HARDWARE AND SOFT WERE USED

- Node-MCU – 32-bit ESP8266 development board with Wi-Fi SoC.
- 4 Relay module
- 4 5W LED Bulb
- Power supply
- Resisters and diodes
- Bc547 Transistors

To build home automation application, I used three different platforms

- Google Assistant
- Ad fruit
- IFTTT

III. BLOCK DIAGRAM

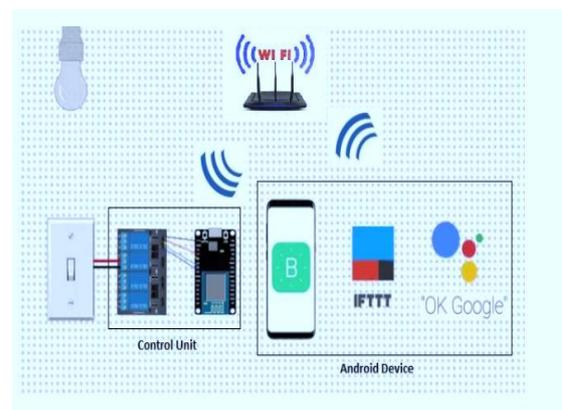


Fig.1 Block diagram.

1. ESP8266- Node-MCU (ESP8266) The Node-MCU (Node Micro-Controller Unit) is an open source software and hardware development environment that is built around a very inexpensive System-on-a-Chip (SoC) called the ESP8266. The ESP8266 is designed and manufactured by Express, contains all crucial elements of the modern computer: CPU, RAM, networking (Wi-Fi), and even a modern operating system and SDK. When purchased at bulk, the ESP8266 chip costs only \$2 USD a piece. That makes it an excellent choice for this system design.

The Node-MCU aims to simplify ESP8266 development. It has two key components. i. An open source ESP8266 firmware that is built on top of the chip manufacturer's proprietary SDK. The firmware provides a simple programming environment based on e-Lua (embedded C), which is a very simple and fast scripting language with an established developer community. And to add on Node-MCU can be programmed with the Android IDE too. ii. A development kit board that incorporates the ESP8266 chip on a standard circuit board. The board has a built-in USB port that is already wired up with the chip, a hardware reset button, Wi-Fi antenna, LED lights, and standard-sized GPIO (General Purpose Input Output) pins that can plug into a bread board. Figure 2 below shows the Node-MCU development board.

2. Relay Board-A relay is an electromagnetic switch. It is activated when a small current of some microampere is applied to it. Normally a relay is used in a circuit as a type of switch, an automatic switch. There are different types of relays and they operate at different voltages. When a circuit is built the voltage that will trigger it has to be considered. In this system the relay circuit is used to turn the appliances ON/OFF. The high/low signal is supplied from the Node-MCU microcontroller. When a low voltage is given to the relay of an appliance it is turned off and when a high voltage is given it is turned on. The relay circuit to drive four appliances in the Home automation system is shown below in figure 3. The number of appliances can be modified according to the user's requirements.



Fig.2 Esp-8266.

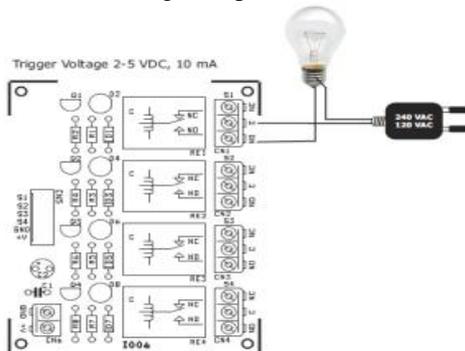


Fig.3 Relay board.

3. IFTTT Application- IFTTT [1] derives its name from the programming conditional statement "if this,

then that." IFTTT is both a website and a mobile app that launched in 2010 and has the slogan "Put the Internet to work for you". The idea is that you use IFTTT to automate everything from your favorite apps and websites to app-enabled accessories and smart devices. What the company provides is 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 Ad fruit app. Setting up the IFTTT application first requires logging in after which we need to create an apple and then "This", i.e. the trigger, here we select Google Assistant and then we will type in the commands to which the Google Assistant should respond and to this command it should control the appliance/relay associated with it.

The response command from the Goggle Assistant can also be typed in as desired. After configuring the trigger, i.e. "This" of the application we need to configure the "That". What should be done once the Google Assistant hears the command which we just configured? This is decided by setting "That" of the app. We click "That" and then select web hooks [7] and click connects. Web hooks will allow us to send commands to the Ad fruit Server. Now, in the URL we type the IP address of the Ad fruit server followed by the Authentication token sent by the Ad fruit and then the pin number of the microcontroller to which the device to be controlled is connected.

Then in the method we select 'PUT' and the content type is 'Application/JSON' [8] and in the body we write ["1"] to turn ON and ["0"] to turn OFF. This creates the action for the trigger i.e. the Google Assistant command. The action taken by it is simply sending a message to the Adafruit to either turn ON or OFF the concerned connected device.

4. Adafruit -Want to make your project talk to the Internet? Connect your existing project to the Internet to log, stream, and interact with the data it produces? What about all this Internet-of-Things (IoT) stuff? Ad fruit IO is a platform designed (by us!) to display, respond, and *interact* with your project's data. We also keep your data **private** (data feeds are private by default) and *secure* (we will never sell or give this data away to another company) for you. It's the internet of things - for everyone!

IV.CONCLUSION AND FUTURE WORK

The aim of this paper was to propose a cost effective voice controlled (Google Assistant) home automation controlling general appliances found in one's home. The approach discussed in the paper is a nice approach to

improve switching and hence Home Automation Using Google Assistant design was successfully implemented. This system is highly reliable and efficient for the aged people and differently abled person on a wheel chair who cannot reach the switch for the switching ON/OFF the device and are dependent on others. The future scope for HAUGA can be huge. There are many factors to improve on to make HAUGA 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. To make the system respond more faster own private ad fruit server can be made. Well, no system is ever perfect. It always has a scope for improvement. One just needs to put on a thinking cap and try and make the system better.

Result

The result was positive and the system responded well.

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