SMART HOME USING GOOGLE ASSISTANT (IFTTT)

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Abstract - *This project aims to develop a voice controlled smart home using a WI-FI and IOT, which is being remotely controlled by any Android OS smart phone. The home automation becomes vital, as it gives the user the comfort and a trouble free system for using home devices. Automated home is an IOT system that allows users to control basic home task and features automatically using mobile devices and computers through voice over internet. An automated home is often called as a smart home. With the evolution of Automation technology, life is getting simpler and easier in all slants. In today's world Automatic systems are being preferred over manual system. With the rapid growth in the number of users of internet over the past decade has made Internet a part of life.*

***Key Words*: Wemos D1 R1, IFTTT, Adafruit.io, Google Assistant, IOT.**

1. INTRODUCTION

Home Automation is a building automation for a home, called a smart home or smart house. Home automation system controls lighting, climate, entertainment systems, and appliances on the users command. It might be voice controlled or switch control. It also includes home security such as alarm systems and access control. When connected with the Internet, home devices become key constituents of Internet of Things. In home automation, a device which is to be controlled is connected to central hub or "gateway". The user interface for control of the system uses tablet, wall-mounted terminals or desktop computers, Web interface, or a mobile phone application,, that may also be accessible off-site through the Internet.

1.1 PROPOSED SYSTEM

The proposed Home automation system is a more forward Home automation system using server, cloud, and sensors. Server is used for tracking and controlling different devices and saving the values in the cloud. In this system IO.ADAFRUIT is used as cloud for storing different sensors values. Google Assistant is used for giving feed to IFTTT. IFTTT serves as broker between them.

1.2. RELATED WORK

1. Sirsath N. S, Dhole P. S, Mohire N. P, Naik S. C & RatnaparkhiN.S

This paper proposes a Home Automation system that employs the integration of multi-touch mobile devices, cloud networking, wirelesscommunication, and powerline communication to provide the user with remote control of various lights and appliances within their home. This system uses a consolidation of a mobile phone application, handheld wireless remote, and PCbasedprogram to provide a means of user interface to the consumer [2].

2. Basil Hamed

The main objective of this Paper is to design and implement a control and monitor system for smart house. Smart house system consists of many systems that controlled by LabVIEW software as the main controlling system in this paper. Also, the smart house system was supported by remote control system as a sub controlling system. The system also is connected to the internet to monitor and control the house equipment's from anywhere in the world using Lab VIEW [3].

2. SYSTEM REQUIREMENT

2.1 ARDUINO IDE

The ARDUINO integrated development environment (IDE) is a cross platform application (for Windows, macOS, Linux) that is written in the programming language Java. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development boards. The Arduino IDE also supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub *main()* into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution. The Arduino IDE appoints the program *avrdude* to convert the executable code into a text

file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware.

2.2 IFTTT

IFTTT stands for **If This Then That.** It is a free web-based service for creating chains of simple conditional statements, called as applets. These applets are triggered by changes that occur within other web services such as Gmail, Facebook, Telegram, Instagram, Google Assistant or Pinterest.

For instance, an applet is capable of sending an e-mail message if the user tweets using a hashtag, or copy a photo on Facebook to a user's archive if someone tags a user in a photo. In addition to the web-based application, the service runs on IOS and Android.

2.3 ADAFRUIT.IO

Adafruit.io is a *cloud service* that is managed by the company. We have to connect to it over the Internet. It is primarily used for storing and retrieving data. But it performs a lot more than that. It presents our data in real-time, online, and make our project internet-connected to read sensor data, Control motors and also Connect projects to web services like Twitter, Gmail, Google Assistant, RSS feeds, weather services, etc. It also Connect our project to other internet-enabled appliances. Adafruit.io is meant to handle and visualize multiple feeds of data. Various functions like displaying data from a temperature-humidity sensor alongside data from an air quality sensor and add a button to turn on or off the air-conditioner or bulb or fan in your room.

2.4 GOOGLE ASSISTANT

Google Assistant is an artificial intelligence powered virtual assistant developed by Google which is basically available on mobile and smart home devices. Google Assistant can engage in two-way conversations living behind company's foregoing virtual assistant. Moreover it is available in different languages providing comfort to customer.

2.5 MQTT

MQTT is an extremely simple and lightweight messaging protocol. It stands for **Message Queuing Telemetry Transport**. Its publish/subscribe architecture is designed to be open and easy to implement, with up to thousands of remote clients capable of being supported by a single server. MQTT reduces device resource requirements and network bandwidth while attempting to ensure reliability and delivery [4].

3. HARDWARE REQUIREMENT

3.1 WEMOS D1 R1

The **WeMos D1 R1** is the microcontroller with an inbuilt ESP8266EX Wi-Fi board which uses similar layout as the Arduino. It operates at a voltage of 3.3V. It is a development board which is compatible with the Arduino IDE. Many existing Arduino shields can be plugged directly into the board as it includes standard Arduino headers. It has 11 digital input/output pins with one analog input pin. It has 4Megabytes of flash memory along with a clock speed of 80MHz-160MHz.

3.2 RELAY

A **relay** is a switch which is operated electrically. Most of the relays use an electromagnet to mechanically operate a switch, including other operating principles also, such as solid state relays. Relays are used in applications where only one signal is necessary to control a circuit or several circuits must be controlled by one signal.

3.3 JUMPER WIRES

Jumper wires are simply wires that have connector pins at each end, allowing them to be used to connect two points to each other without soldering. Jumper wires are generally used with prototyping tools and with breadboards in order to make prototyping easy to change a circuit as required.

3.4 DHT11 SENSOR

A **humidity sensor** senses, measures and regularly updates the relative humidity present in the air. It measures both air temperature and moisture. Relative humidity is expressed as a percent. It is the ratio of actual moisture present in the air to the highest amount of moisture air at that temperature can hold. The warmer the air, the more moisture it can hold, so relative humidity changes with variations in temperature.
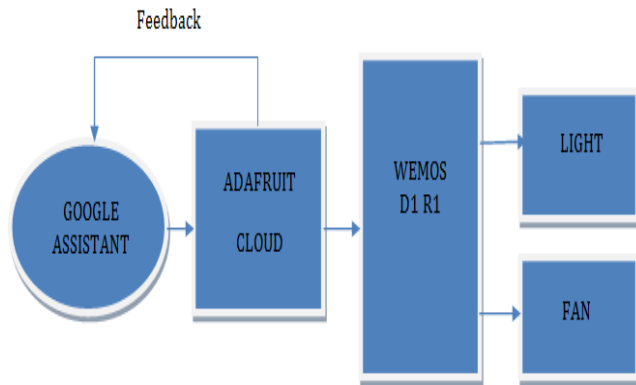
4. SYSTEM DESIGN

4.1 BLOCK DIAGRAM

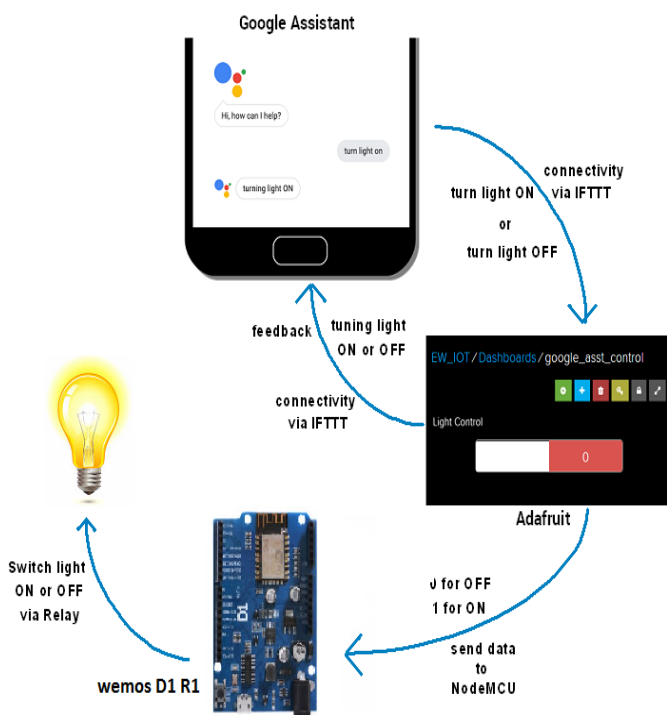Fig1: Block Diagram

4. FLOW DIAGRAM

Fig2:Flow Diagram

5. IMPLEMENTATION

5.1 ON IFTTT

1. Create an account on the IFTTT platform.
2. Post an IFTTT service for your project.
3. Move an IFTTT skill in your project.
4. Make an applet.
5. Test whether the applet works or not.

5.2 ON IO.ADAFRUIT

1. Create an account on the Adafruit.io platform.
2. Select the Welcome Dashboard which is already loaded.
3. Start the dashboard creation process by selecting the ACTIONS menu which is on the upper left hand side.
4. Next, select **Create a New Dashboard** from the menu.
5. Enter the description and name of the newly created dashboard, and select the **Create** button when you are done.
6. Select your new dashboard, once it has been created.
7. You should be able to see your new blank dashboard.
8. Next step is to create and add blocks.
8.1 There are various blocks available some of which can be used as outputs, and some can be used as inputs. Go to **+** (plus) button to add a new block which is on the upper right corner of the dashboard.
9. Here we are using a Toggle Button, Gauge.
10. The toggle button will allow you to switch between any two text or numeric values.
11. Until you click the button again to toggle to the second value, the values will be same.
12. You can instantly view the current value of a numeric feed on the gauge block.
13. The values are graphically displayed using percentage scale; one can set a minimum and maximum threshold value for the gauge.
14. The values in the gauge will be updated automatically whenever a new value is published to the feed.
15. Login to Google Assistant using same account which was used for IFTTT and IO.ADAFRUIT.
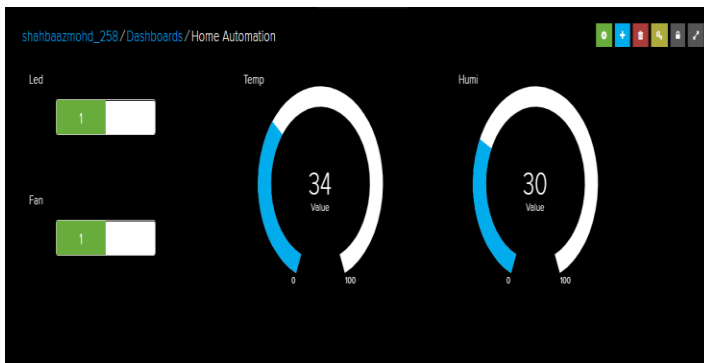
6. RESULTS

Fig 3: Hardware

Fig 4: Adafruit Dashboard

After the successful connection to the server, the data of sensor are stored in the cloud for monitoring. The above figure allows us to monitor and control the system. From this Dashboard Toggle Buttons are used to control the home appliances.

In general, voice command is give to Google Assistant which connects through IFTTT to IO.ADAFRUIT.This IO.ADAFRUIT is responsible for sending data to appliances through microcontroller. In case if the device is not been setup, ADAFRUIT gives feedback through IFTTT to Google Assistant.

7. ADVANTAGES & APPLICATIONs

7.1 ADVANTAGES

1. Controlling your appliances from any place.
2. Voice control of home devices.

7.2 APPLICATIONS
1. Switching light and fan automatically.
2. Observing different sensors data.

8. CONCLUSION
The automated devices using Internet of Things has been practically proven to work by managing simple appliances, and the appliances were successfully controlled through voice commands. This system Monitors the sensor data, like temperature and humidity but also switches on or off the light whenever required by the user. It saves the sensor data in the cloud. It helps the user to analyze and control the conditions of various parameters in the home anytime from anywhere.

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