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APPLICATION OF HOME AUTOMATION SYSTEM USING GOOGLE ASSISTANT

Ms. Preeti U. Melikatti
Research Scholar, Department of Computer Science and Technology, V.V.P.I.E.T. Solapur, Maharashtra, India.

Mr. Vinayak V. Palmur
In. HOD, Department of Computer Science and Engineering, V.V.P.I.E.T. Solapur, Maharashtra, India

ABSTRACT
The research work presented here is an attempt to exaggerate on use of technology for the betterment of human beings. The research work has been done for using the Google assistant system for driving the home automation. The usefulness of this concept has been tested and analyzed further showing its advantages over other technologies available in the market today.

INTRODUCTION
Today one of the topics which are getting the reputation is the Home Automation because it has many advantages. Home automation refers to monitor and control of the house appliances distantly. We can also be witnessing the never ending growth of the internet and its applications, there is an enormous prospective and extent for distant access control and monitoring of such system enabled electronic appliances. Automation performs an ever more very important role in daily understanding and worldwide economy. Engineers struggle to unite automated devices with arithmetical and managerial tools to generate multifaceted systems for a quickly mounting range of application and individual activities. This notion of dwelling automation has been there since late 1970's. But with the improvement of knowledge and elegant services, people's outlook has altered a lot during the route of time to completely turn the conventional house into elegant home. A home mechanization system means to award the endusers to administer and handle the electric devices. If we look at dissimilar home mechanization systems over the time, they have constantly tried to present efficient, expedient, and secure ways for home population to admittance their home. in spite of of the change in user's trust, mounting technology, or alter of time, the exterior of a home automation structure has remain the identical.

LITERATURE REVIEW
Nikhil Rathod [1] et al, presented the architecture which is low cost and also they proposed flexible home Automation system which is using advanced versions of the Arduino microcontrollers. They concluded that using an Arduino is very easy to recognize with easy coding. They claim that implementing this kind of system we can make sure that the energy management can be completed It will augment the competence of this purpose. We manage the complete home domestic device over the internet. This will augment the reassure ability of humans and it will decrease the Human hard work.

Prasad Mhanta [2] et al, presented a suggestion for home automation by means of voice through Google Assistant Home mechanization. Unblemished controlling of home, monitoring and encoding by the end client have yet to enter the mainstream. This can be promising to build up an self-governing and self-managing system and extensible home coordination that can hold toady's elegant devices and technologies of conflicting characteristic and protocols. They suggest that residence appliances can independently be controlled equally

from inside the home and distantly. This is very obliging to physically challenged citizens. In the projected system they have worked on receiving the announcement on our phone at whatever time anyone clandestinely enters into the room.

Florence S [3] et al, presented an suggestion to apply automation on devices like fans, the lights, the fridge etc., to be controlled over voice. A straightforward home automation can be prepared with the aid of Google Dialogflow, Firebase and NodeMCU. The Hub RED is connected with IOT gadget-Node-MCU. The Node-MCU be supposed to be included with normal home apparatus. The stream printed in the Hub Red will be convey in the DialogFlow that will be synchronized with either the Amazon Alexa or the Google Assistant. At whatsoever point orders are specified it triggers the encoding interface call during the cloud to the synchronized NodeMCU. The information is transformed into sign to roll the home apparatuses ON or OFF The tip of the task to recommend a cost creative voice controlled (Google As- sistant) home mechanization controlling universal apparatuses originate in one's home.

B. Hemalata [4] et al, proposed a system which is implemented by means of normal household appliances, Natural language voice instructions are specified to Google Assistant and with the aid of IFTTT (If This Then That) function and the Blynk application the instructions are decoded and then send to the microcontroller, this microcontroller then control the relays associated to it as requisite, turning on or off the mechanism associated to the respective relay as per the users demand to Google Assistant. The microcontroller utilised is NodeMCU (ESP8266) and the communication connecting the microcontroller and the function is recognized via Wi-Fi (Internet)."

Deepjyoti Choudhury [5] represented the concurrent Home Automation arrangement measuring cost effectiveness using IoT surroundings. The logic at the back this paper is to organize the home appliances like any electronic gadget throughout the Google Assistant which associations with the IFTTT server. If the circumstance satisfies, then the act will be taken to the Adafruit MQTT server to get communication with the home appliances. We have also presented the way to restore the physical system and to keep the electrical energy and human energy in this paper.

Dr. Sanjay Pokle [6] projected a home automation arrangement that is controlled by the voice and applications. In this, they have prepared their own Alexa on the raspberry pi which is used to control a variety of house appliances. After designing each constituent of the system, it is seen that their system works productively. They created a prototype of the Smart Home Mechanization System. This system is easily controlled through voice, and android applications also through manual switches. Contrasting with most high- end home mechanization systems, proposed replica is cost efficient and very suitable to use. They have majorly paying notice on innovating these conventional home automation systems accessible in the market and urbanized a simpler arrangement which is easier to influence thus making human existence simple.

Ashutosh [7] et al, proposed a authoritative voice-controlled (Google Assistant) Home "Robotization" leading general equipment to excel the reassure of one's home. The method examined contained by the paper is tremendously beneficial as GACHA's (Google Assistant Controlled Home Automation) arrangement was successfully actualized and completed into trial product that can be outstandingly employ. This plan is exceptionally solid and creative for everybody, be it a normal adult or a multifariously abled person on a wheel chair who can't get to the switch for turning the machination ON/OFF and are eager about others.

Ann Maria Jaison [8] et al presented an elegant metering scheme via Google assistant and scheming devices. It's easier to compare with website or some mobile applications. since every phone have incorporated with Google assistant/Siri so there is no need to construct any website or application. Elegant metering systems are thus an essential part of the developing technology for a elegant home. Its function in various field and has a lot of payback. However, its design should convene some pre-laid principles.

Aayush Agarwal [9] et al, proposed, a original architecture for short cost and bendable home Automation structure using Arduino microcontroller and implemented. in general Arduino is simple to appreciate & its coding is trouble-free. By implementing this kind of structure we can make sure that the energy maintenance can be ended. By aid of this structure we can augment the competence of the appliances .we can have the whole control above the home appliances from a long remoteness. This will augment the comfort ability of human life form and it will decrease the Human labors.

Neha Malik [10]et al, Surveyed diverse home automation system showed that there are a variety of kinds of technology used to apply this type of arrangement. All the planned systems have been offered and compared in this paper which reveal some qualities and demerits of the systems. This assessment explained diverse home automation system e.g. Web based, Arduino microcontroller based , mobile-based, SMS based, Bluetooth-based, ZigBee-based, Android app based, cloud-based & IOT based. Due to its act, ease, low cost and dependability home automation structure is making its place in global market.

Sandeep Chintha [11]et al , presented a study on IoT Technology which is flattering more resourceful these days because of marvelous increase in home mechanization applications and as well all could be controlled from wherever sitting at a place. The running of these IoT devices is mechanical and there is no want for man-made intervention. It provides better advantages which decrease power by civilizing home security. On the other hand, house automation scheme is elastic to lodge new appliances because one can function the appliances even although if the user is far away from the house. With the aid of such IoT devices, the everyday lives or the job of the user is made easier and accurate.

Discussions:

Review of diverse home automation system showed that there are a variety of technologies used to put into practice this type of structure. All the planned systems have been obtainable and compared in this paper which reveal some qualities and demerits of the system. This assessment explained diverse home automation system e.g. Bluetooth-based, Web based, mobile-based, ZigBee-based, SMS based, Arduino microcontroller based, Android app based, IOT based and cloud-based. Due to its recital, ease, low cost and dependability home automation system is making its place in global market.

WORKING PRINCIPLE OF GOOGLE ASSISTANT

Google assistant is an artificial intelligence-power virtual assistant developed by Google that is primarily available on mobile and smart home devices. Google assistants can engage in two-way conversations. Actions on Google allow 3rd party developers to build apps for google assistant.

Google assistant is AI (Artificial Intelligence) based voice command service. Using voice, we can interact with google assistant and it can search on the internet, schedule events, set alarms, control appliances, etc.We can control smart home devices including lights, switches, fans and thermostats using our Google Assistant.We will build an application that can control home appliances. Here, we will control a bulb & fan using Google Assistant service.

This application includes Google assistant along with Adafruit server and IFTTT service.

There are some main components of a home automation system: Mobile phone with google assistant,Adafruit ,controllers,breadboard and devices to be operated.

Google Assistant helps to give commands to control devices. Home automation systems can then adjust those settings to our preferences. IFTTT (If This Then That).

If This Then That, also known as IFTTT is a free web-based service to create chains of simple conditional statements, called applets. An applet is triggered by changes that occur within other web services such as Gmail, Facebook.

PROPOSED SYSTEM

The architecture diagram of Home Automation system consists of Node MCU and smartphone. The wireless communication between the smartphone and the Node MCU is done over the Internet. Android OS has a built-in voice recognizing feature named Google assistant which is used to develop a smartphone application which has ability to control the home appliances from user voice command. This application converts the user voice command into text, then it transmit that text message to Adafruit libraries which is connected with Node MCU through IFTTT website which is abbreviated as IF THIS THAN THAT and is a website used to create a simple chain of conditional statements called applets.

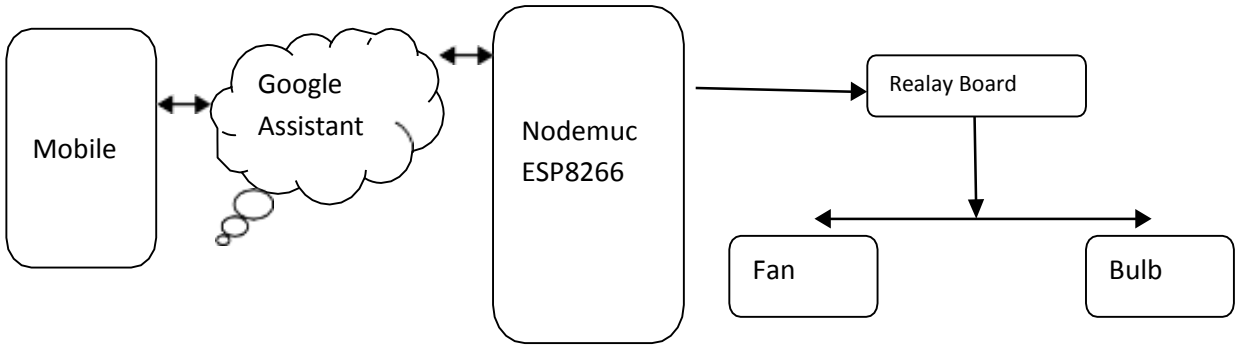


Fig 1: Block Diagram

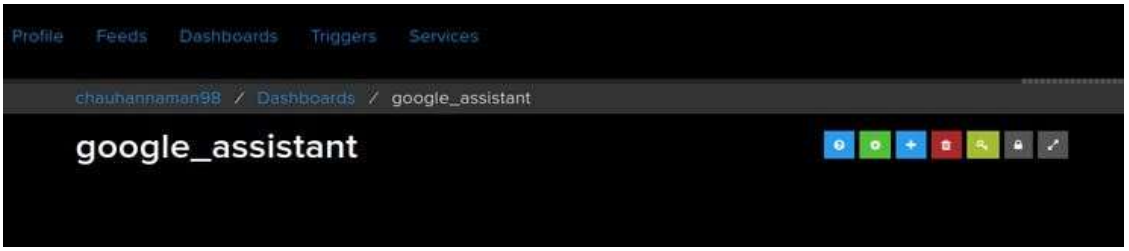
METHODOLOGY

Creating an online service account

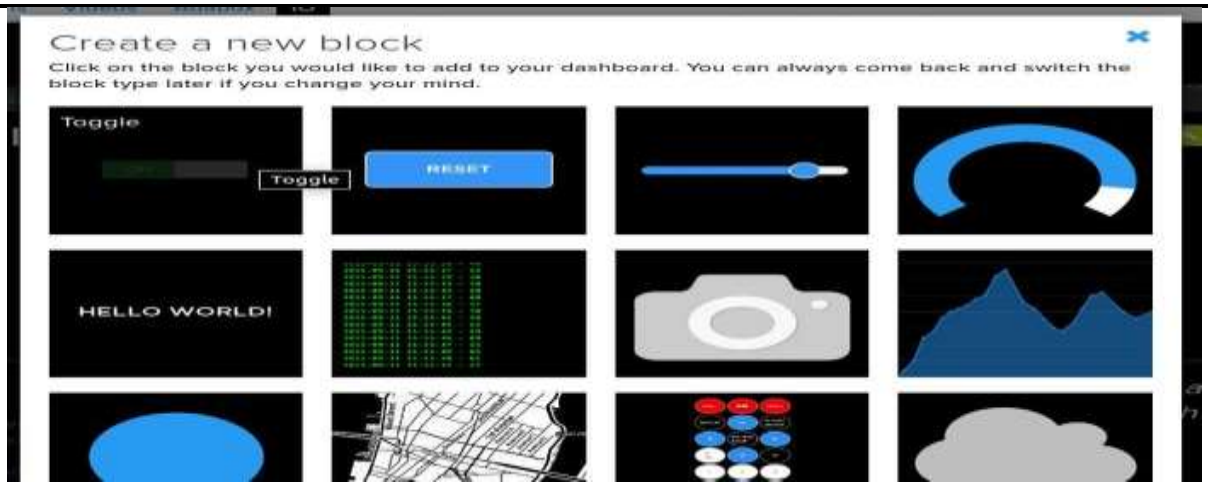
Step 1: First, created an account at www.Adafruit.io

Step 2: Now, create a dashboard. This dashboard is a user interface to control things remotely.

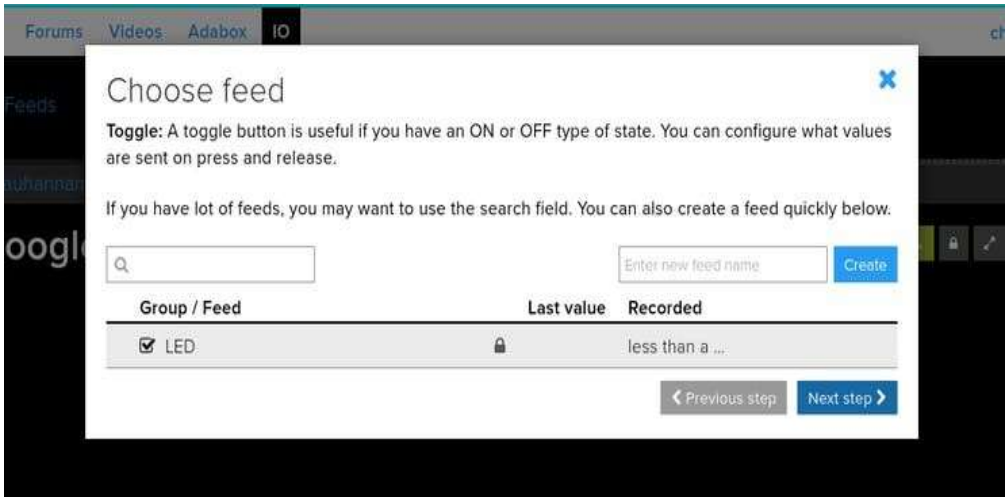
Step 3: After following the above steps, provide a name to the dashboard and save it.



Step 4: Now, create feed (user interface) to control light On-Off. To create it, just click on the '+' symbol and select the toggle feed shown below.



Step 5: After selecting toggle feed, a pop-up window appears as shown below.



Step 6: Enter the name of our feed (shown in a red box) and create it. After creation, select the created feed (here mine is light) and then click on the Next step. In the next step configure the feed which is shown below.

Step 7: Here, I used 0(OFF) and 1(ON) text for button and then click on create. This will create a toggle button on your dashboard which can be used to control things remotely.

RESULT

Here, after successfully implementation of AI based Home automation system using Raspberry Pi. We developed & successfully tested our prototype from hardware as well as software perspective. Two separate micro-controllers are used to process the user request and one common GUI is designed to show the result.

Fig 16-: AI based Home Automation Working Prototype

We Designed one interactive & user friendly GUI using Python and Flask framework. With the help of that GUI user and get the clear visionary surveillance of home and can easily operate the appliances.

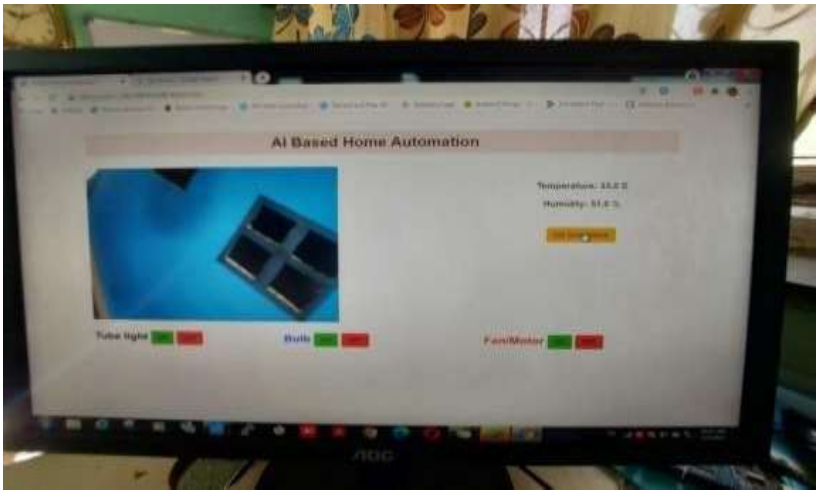


Fig 17-: Interactive GUI

CONCLUSION

The Home automation using Internet of Things has been experimentally proven to work satisfactorily by connecting simple appliances to it and the appliances were successfully controlled remotely through internet. The designed system not only monitors the sensor data like temperature, gas, light, motion sensor but also actuates a process according to the requirement. For example, the switch gets dark. It also stores the sensor parameters in the cloud (Gmail) in a timely manner. This will help the user to analyse the condition of various parameters in the home anytime anywhere. The home automation using Internet of Things has been experimentally proven to work satisfactorily by connecting simple appliances to it and the appliances were successfully controlled remotely through Internet. Home automation is undeniably a resource which can make a home environment automated. People can control their electrical devices via these home automation devices and set up controlling actions through mobile. In future this product may have high potential for marketing. Further it can be demonstrated from computer instead of mobile phones for controlling appliances of any large places like industries, hospitals, institutions etc., centrally.

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