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Ito Based Amazon Alexa Using Raspberry Pi

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Abstract:
The IoT development has made life cooler in all features. In today's world chosen an automated system over manual mode. These developments have to receive large consideration with the development of communication skill in home automation system. In IoT based smart home application proposed used to the internet to control devices easily and provides home safety applications in Amazon Alexa. These can be able use to control the appliances from anywhere through the internet. Node Microcontroller Unit is used to connect sensor in Wi-Fi module and update their data. In NodeMCU all these devices are connected in the system. The user can operate in home appliances and without wasting time should move from anywhere like office to home from opening the door in these system. In these relay is used to the control home appliances. These appliances can easily control over the internet and these can be supported in home security through in autonomous functioning. The cost is low and consistent automation system that reduces in energy consumption and can provide comfort in these systems.

Keywords: Amazon Alexa, Internet of Things (IoT), Wi-Fi, Relay, NodeMCU.

INTRODUCTION

In recent years, these have been seen in significant investments that made by research community and from the industry in IoT field. Specifically, In Smart Home applications that have been used through prime focus by introducing of devices like as Amazon Echo, Google Home, and Samsung Smart Things etc. The industry that as growth in results by innovative, economic, and advanced solutions etc. In this paper, we manly focus on making non-smart homes applications that have to how to build in robust, cost-effective system that can be widely used in these systems. We give power to the system by using through Amazon Echo, Amazon's cloud services, its speech services etc. In Raspberry Pi B+3 is used in hardware component that provides smart features in non-smart home applications. This describes about the different components of our product that describes about that how the system works effectively to switch on and switch off the applications in our home. From this system, the home appliances such as light, fan, TV etc., are permitted to unique address and that are connected to a shared gateway. These appliances can be controlled from mobile or any smart devices which can reduce energy consumption in this system. These systems provide to interface easily and that allows to setup and controls the devices efficiently. The heart of this proposed smart system based on IoT is the Node MCU (Node Microcontroller Unit) which is used to gather the data and attained by the sensors and that provides to the server. Furthermore, the users over mobile to perform exact responsibilities given in microcontroller that receives commands.

RELATED WORKS

ShradhaSomaniet.al has proposed home security which is used to realize in motion sensors. In any movement these can be detected at the entrance of the house, a notification and image are sent to user email address by using Simple Mail Transfer Protocols. These users can be able to

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use control the fan, lights and AC etc. In smoke sensor was used to detect the smoke and aware the user. Mansour H. Assaf et al has proposed home automation system in which the user can interact with the system through the Internet. In home appliances can be used to control over using web page. In these Smart Home appliances that displays in a web page and that can be controlled over web browser and also monitored in real time applications. Here when the threat is detected, the alarm starts with the help of motion sensors. The user can be notified by text message.

LITERATURE REVIEW

In [1] author that has presented the idea about to build Alexa through Raspberry pi using open source code mode available by Amazon on Github. And the author has highlighted in needs of high quality audio through the input microphones for Alexa that respond precisely. In [2] author has the term voice assistant means conversational agent who does tasks, whether functional or other, that which the person is capable to improve his or her understanding level speaking in background sound. In[3] author has explained in detail in digital forensics in cloud and client-centric artifacts pertaining to IVA Alexa Ecosystem that based on deep learning, and the author has proposed proof-of-concept, the CIFT tool that has to support identification, acquisition and same analysis. In [4] author has explained the corresponding opinion keywords from the reviews using natural language process techniques. In [5] author has proposed home security which is used to realize in motion sensors. In any movement these can be detected at the entrance of the house, a notification and image are sent to user email address by using Simple Mail Transfer Protocols. These users can be able to use control the fan, lights and AC etc. In smoke sensor was used to detect the smoke and aware the user. In [6] author has proposed home automation system in which the user can interact with the system through the Internet. In home appliances can be used to control over using web page. In these Smart Home appliances that displays in a web page and that can be controlled over web browser and also monitored in real time applications. Here when the threat is detected, the alarm starts with the help of motion sensors. The user can be notified by text message.

EXISTING SYSTEM

Raspberry pi B+3 is a mini size computer chip and that has inbuilt Wi-Fi module. Arduino and raspberry pi 2 are not having inbuilt Wi-Fi. If we make this project by using Raspberry pi 2 and Arduino that used in these project to connect through the Wi-Fi module. So here we use the Raspberry pi 3. In existing system the IR sensor is used to give the better results comparing to the PIR sensor.

PROPOSED SYSTEM

The system works in range 3.3v and 5v DC supply. In these Components connected to raspberry pi B+3 are LDR sensor, relay driver. The relay driver is connected into two electrical appliances such as light and fan. When the LDR sensor that senses the light, if the room is dark the lights

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will ON or OFF, and the temperature sensor is used to detect the temperature when the temperature that reaches maximum level then fan will on automatically. When the power is used in our system by using Amazon Echo, Amazon's cloud services, and its speech services etc. Smart Personal Assistant device that is presents in the user's home applications. These trigger modes are used through voice commands. Based on the request, it will response to the user and it will returned to the user.

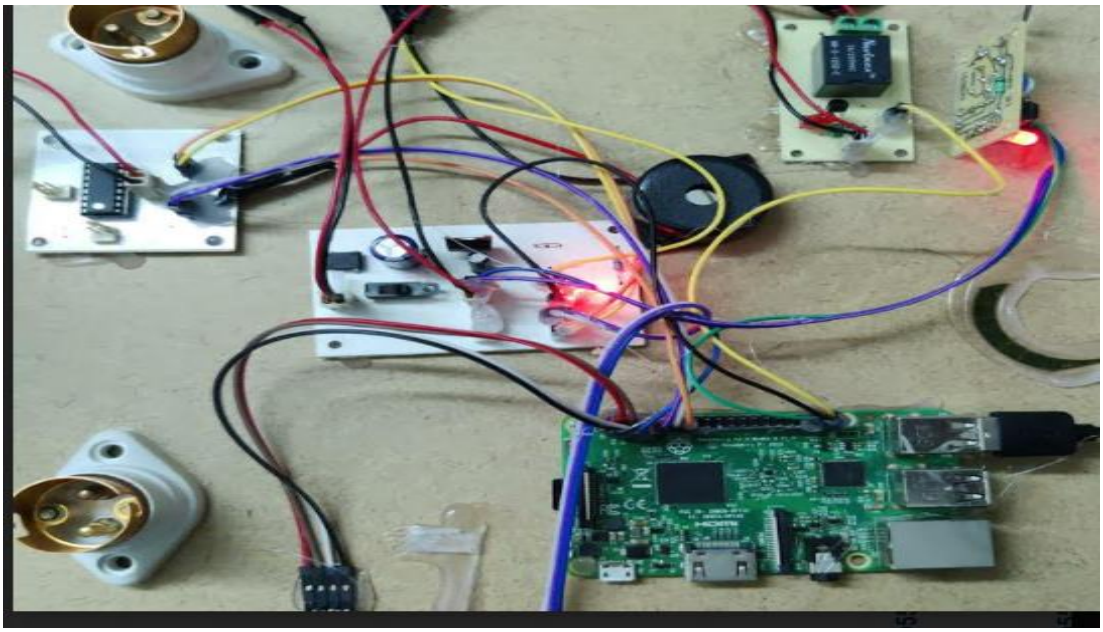

Fig: Proposed system of Amazon alexa

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FLOWCHART:

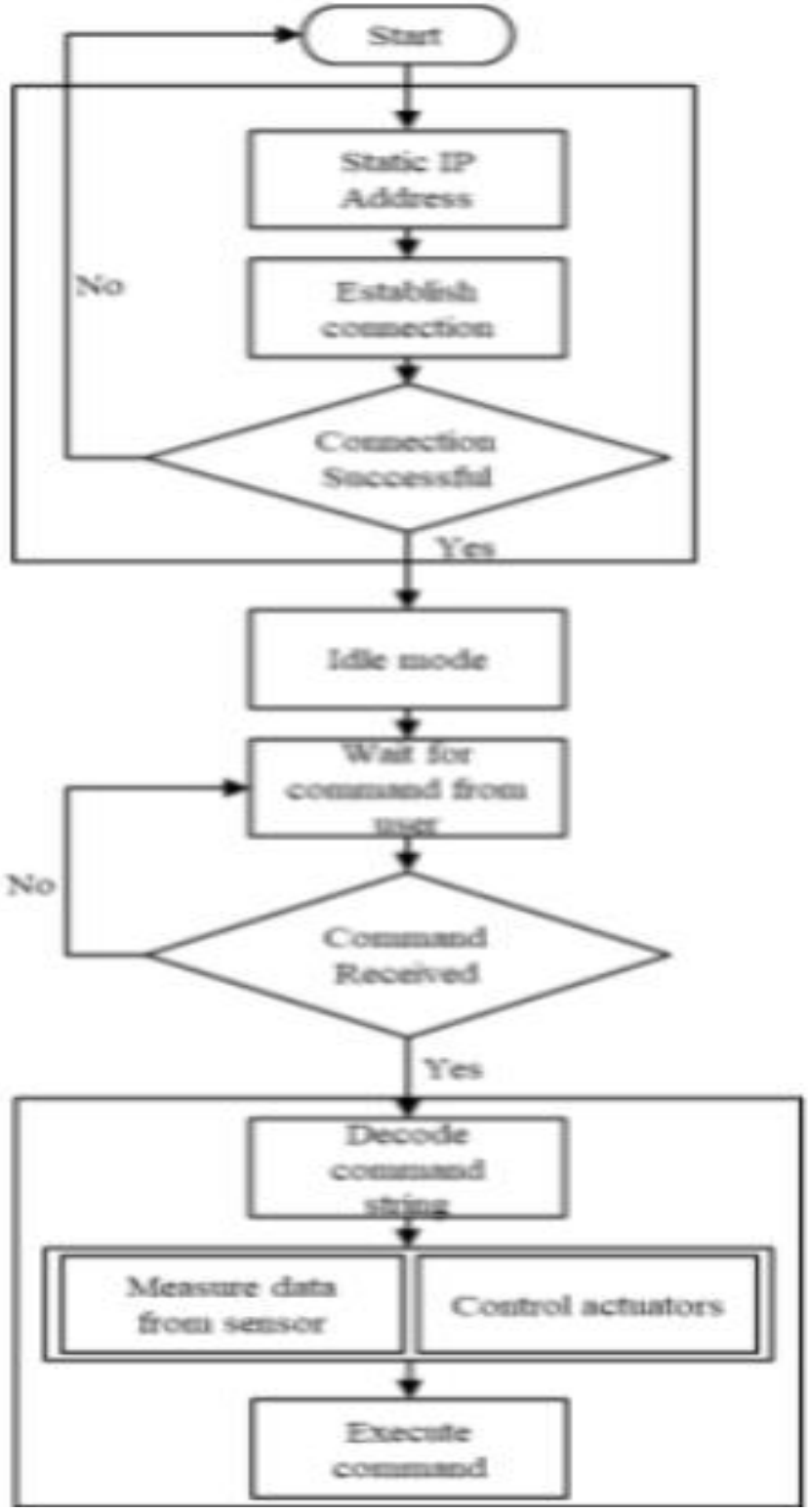

Fig: Flow chart of Home Automation in Alexa

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In fig flow chart shows that the process has involved by initialization from devices as well as that the steps involved in execution through command. The system that power up to establish after the connections needed by the webserver. Then the user will login with their accounts. During the initial setup, and the user will have to pair with Raspberry Pi to their account. The Raspberry Pi will access to the particular user's database, where the sensor is readings and switch the values are stored in the data and after they will update the new version with the current values of the environment. These systems will go into idle mode then. It will wait for the command through the user; we can get it from a local network or through the internet. Once the command is received, then the sensor will stored the data and that measures for any clash with pre-set user through the parameters, if there is no clash then the command is executed, else the user is notified or not, the error is caused due to clashing of protocols. Then the sensors values are updated through the webserver in regular intervals. If the set values are out of the range by the user then the user is alerted through the connection. So, that the appropriate action will be taken to bring to control the situation. The PIR sensor is used to detect the type of motion; this is useful by tracking in any unauthorized access by user. When the user is not at home, thus improves the safety of the house by this processor. The monitoring of movement that helps as certain through if a particular room has no occupants but if appliances are active or not, then the user is notified about the same. The user that can access the system via through the web application, mobile application or via the touch console, which is an optional that if extra is used. On the first use of the applications, the user has to register themselves. On login in they have to pair their account through the device. Once the paired applications that can log into their account from anywhere they make changes to their system.

ADVANTAGES

1. Adding Convenience to our Daily Life.
2. Customize.
3. Security.
4. Easy to use.
5. Save Money and Good Environment.

DISADVANTAGES

6. There are plenty of pros and cons that has to be consider whether to decide convert or not in our home applications in smart home.
7. Smart homes appliances are not in everyone. So, that has to helps to bring down in our electricity bills, simplify our daily tasks, that helps to give us a feels security in our home.
8. Some people smart home product that has simply to turn into an economic burden. It's ultimate up to they have fall to should decide which category.

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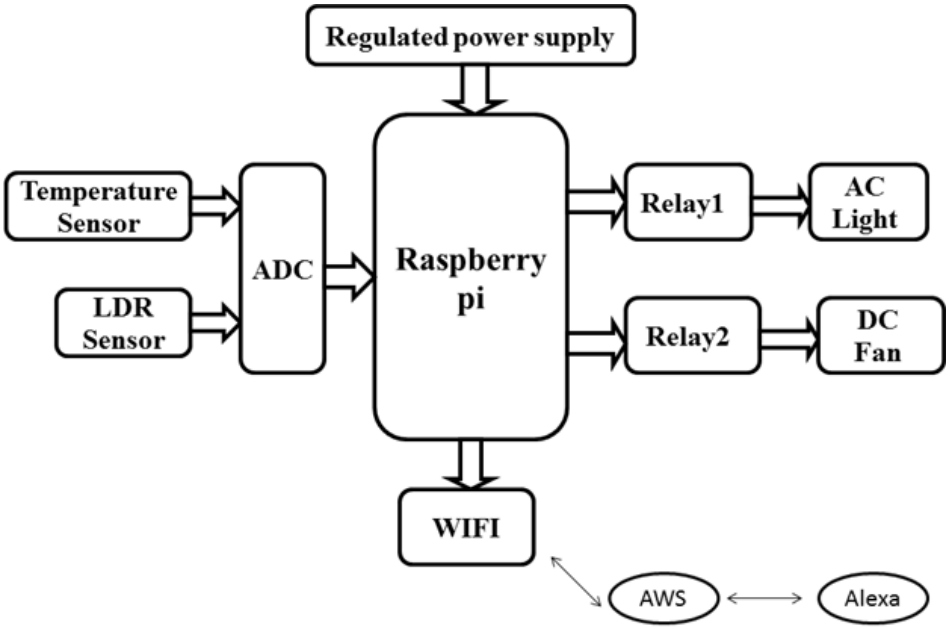

Fig.1: Block diagram

HARD WARE REQUIREMENTS:

1. Regulated power supply (RPS)
2. Microcontroller(Raspberry pi)
3. Temperature sensor.
4. LDR sensor.
5. DC fan.
6. AC bulb.
7. Relay 1
8. Relay 2
9. Wi-Fi.

IMPLEMENTATION:

SMART HOME SYSTEM USING ALEXA

In Smart home systems that contains in actuators, sensors and controllers that used to improve safety, comfort from the people. In today's world, smart devices such as smartphones, washing machines, sensors, TV applications and refrigerators are involved in people day-to-day life. These smart home devices are used to capable of interacting and communicating to discover a smart environment. In various machineries, music players, air conditioners and fans these applications has been used to prepare home appliances to control the system. The proposed system the smart home applications are used in Amazon echo dot and it easy to access. The Amazon echo dot is also known as Alexa these established by Amazon. In home automation the current skill is used to transforms home to different level that can performs the different set of tasks repeatedly. This system is used to reduce electricity power. In Figure 1 shows the proposed smart security system in home using Alexa. In voice input is given to Alexa device which is

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connected to AWS (Alexa Web Service). AWS is connected to NodeMCU. That which connected to Wi-Fi module and it is used to communicate with home appliances. The appliances like door, light, fan and TV is connected to NodeMCU. And the User says Alexa, can you please open the door? The command is received by NodeMCU, then it sends the corresponding command to the appliances. Suppose if voice input cannot be used at that time Alexa app is used. Sinric is used to interface between NodeMCU and Amazon Alexa.

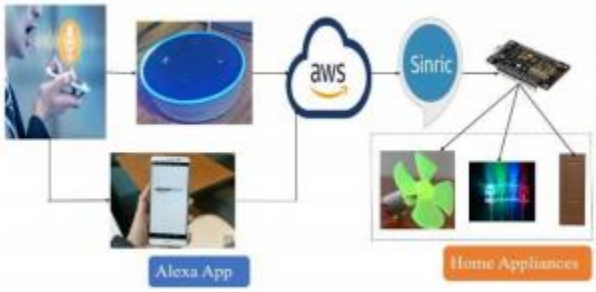

Fig.2: Proposed smart security system using Alexa

Alexa Voice Service

Voice controlled smart home is in modern trend after the introduction of Google Home and Amazon Echo. These benefits of using voice in smart home are to decrease the struggle of using smartphone. Mainly the users can be used to save the time by using voice instead of text command. People with incapacities of using these applications also can be able to access this system. Voice commands are captured by using Alexa which is qualified by the creators and the user requests “Alexa, open the door” the door gets open. Alexa is the keyword that describes shows in fig 3

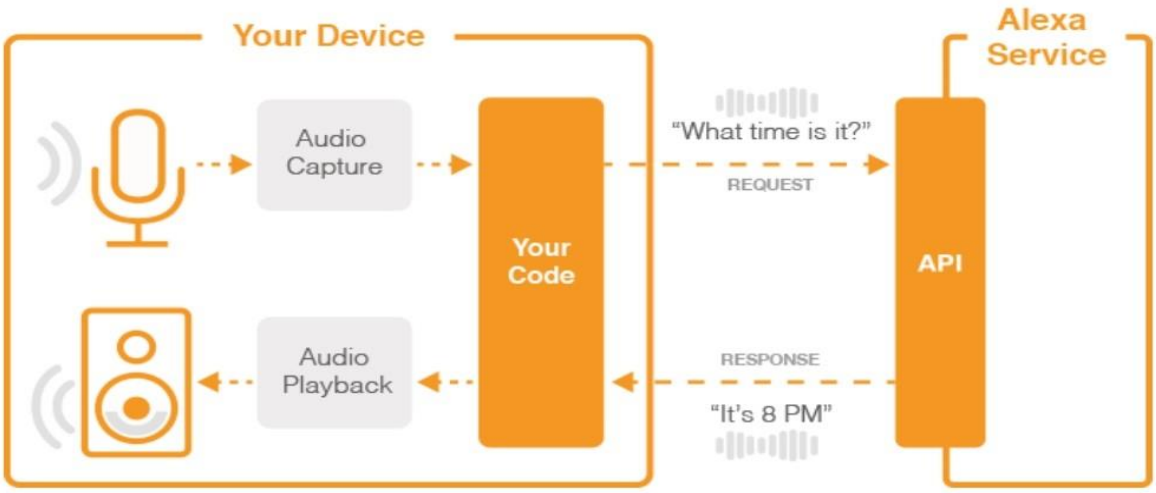

Fig 3: Audio signals through Alexa voice service

Amazon Echo dot

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Echo devices connected to the separate associate service that which responses to the team Alexa or Echo. In these the users may change this stir word to “Amazon”. The user can be anywhere in the room, once user woken up their Echo, he/she can ask any question such as time, weather, news, traffic, sports scores, restaurant etc. The user just has to learn and use the accepted commands in this system. The User’s Echo should send text the information in the Alexa app in their mobile or tablet. The Amazon Echo Dot looks more like a hockey buck than the echo of the original cylinder, which is 3 inches in diameter and nearly 1.5 inches tall that shows in fig 4. It has a few buttons above it and that controls the volume, display the speaker, and raise the device to ask a question or command. **Creating Amazon Account**

Before begin using Echo Dot link it to a Wi-Fi network and register into an Alexa app. For new user, first create an account in amazon Alexa app and signup with name and mobile number. After providing mobile number through Amazon Alexa sends the OTP message. For existing user can sign in with user name and password on iPhone or Android device.

Fig 4: Speaker of Amazon Echo Dot

SOFTWARE REQUIREMENT:

1. Python.
2. Raspbian OS

APPLICATIONS

1. Homes
2. Hotels
3. Office

CONCLUSION

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Smart home applications are used because human are forget to turn OFF the devices. The purpose is to control the key in smart home appliances devices by through voice. In home automation system is an important step towards to increase in advance technology in these equipment industries, and then another way to avoid human error and to reduce energy consumption. By using Alexa is also useful to controlling home appliances. It controls all the home appliances and that provides in healthy and comfortable lifestyle to the users, but also helpful to the sick or disabled and living alone for elder people so that they can easily handle these types of tasks. This system is more flexible and friendly to the user.

Fig 5: The Proposed system using Amazon Alexa or Echo Dot

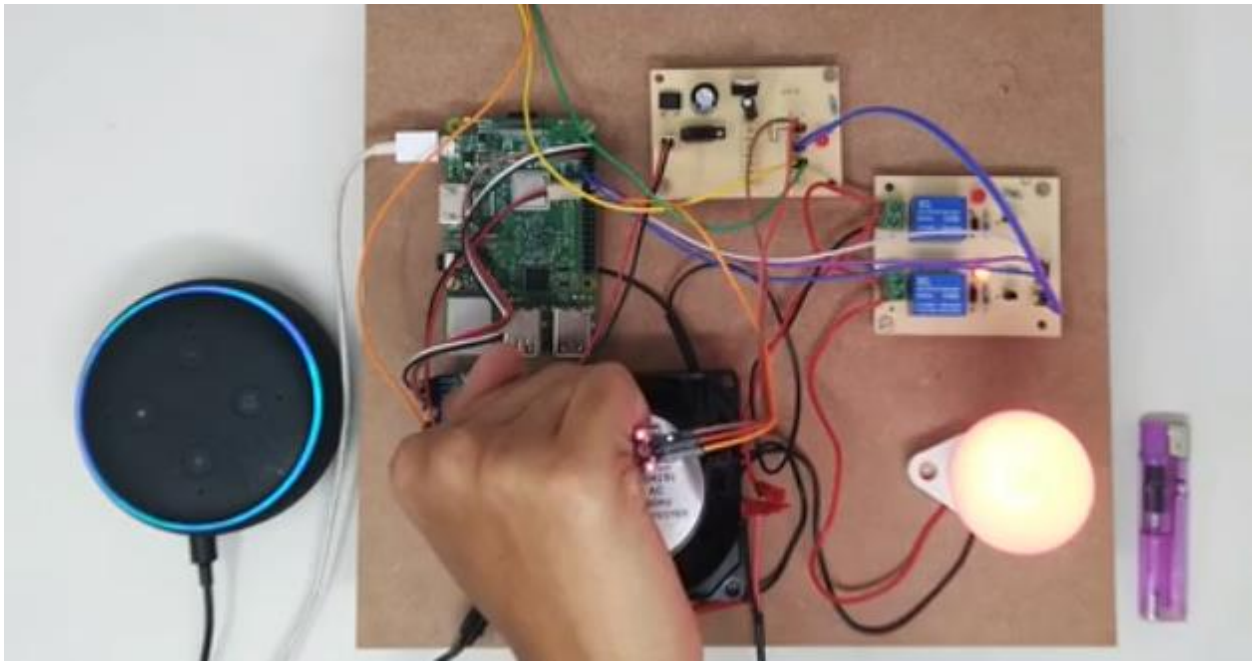

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Fig 6: The Proposed system shows “trigger ON” light

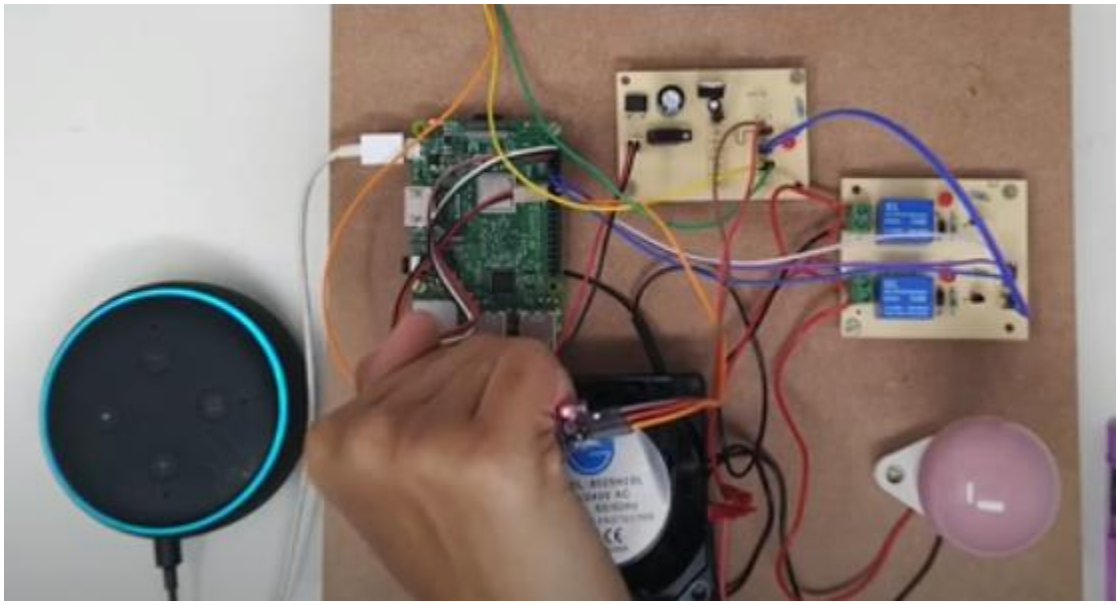

Fig 7: The Proposed system shows “trigger OFF” light

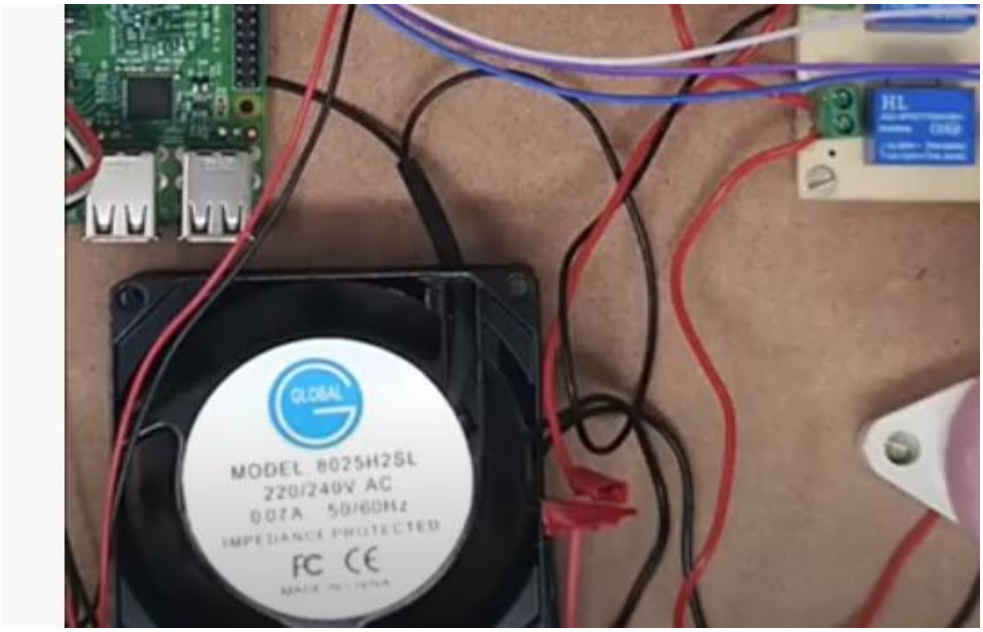

Fig 8: The Proposed system shows “trigger ON” fan

FUTURE SCOPE

These Alexa is used entire commercial experience furthermore, we need to open up the reference design is used to support the same far-field speech recognisation that found on echo to hardware manufacturers, that allows them to integrate in array of gadgets but the real magic of AI is used to analyze huge amounts of data by learning highly sophisticated algorithm and that actually works for key “features” in these content like (images, sound waves or text) and so far.

This process is used in results no in time based relevant results and in other highly sophisticated algorithm that works on actual objectives, making decisions in highly sophisticated algorithm

pumping out results. Updating the Alexa kit and corresponding Lamba that gives another name to updated version alexa that makes actually get to their sooner or later.

In case study, there is a feature mining and sentimental mining, that personal pronoun that refer the data in the device rather than Alexa. In the trigger mode person notification that analyze the emotions

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