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SMART VOICE CONTROLLED AUTOMATION USING ESP8266 AND ALEXA

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ABSTRACT: *The smart voice-based automation plays an indispensable part in the future. Home automation combined with Wi-Fi technology gives best results. We can control household devices autonomously. It reduces the cost and power. In this project smart voice-controlled automation is discussed, devices are controlled by Alexa combined with sinric technology. Solid state relay is used for controlling devices. Here diverse components are used. Our project works effectively to turn on/off our devices. This work very much useful for physically disabled People (who cannot move their hands and legs but can speak and listen) through various voice commands based on concerned parameters which is also ecofriendly.*

Keywords*: Automation, Wi-Fi technology, Sinric, Node MCU, Alexa, Solid state relay, Aws cloud*

I. INTRODUCTION

The smart home automation system is used to control electronic devices. This is done by using speech requests .This method uses voice recognition technology and user interface device. We take Alexa to develop the skill that will connect with microcontroller to operate our appliances. Whenever we must on/off the devices we use echo to switch the appliances on or off. This system reduces the need of human involvement. The progression of smart areas desires automate totally. Hence this ideology could helpful to make the smart cities. Home automation develop through internet of things affords finer flexibility, security protection etc., in a huge manner. This work will assure the connection of a greater number of automation homes in wider area. Smart home can control by your voice. People wish to better their lifestyle and finding different ways to make things easy simple they wish to upgrade to latest technology. Customer are attracted more by the latest or new upgrading technologies that make their lifestyle easier and simple. Automation requirements plays a vital role in the society in daily life. This merit can be largely used in Television remote controls, burglar alarm circuits, water repository management systems and in protection systems. There is no frequent payment to use echo home automation it's completely free after installment. It helps us to automate a bulk of electronic devices at home. A microcontroller receives signal from speech recognition device passes signal to solid state relay for put on/off devices attached with system such as tube lights, thermostats, monitor, refrigerators etc. This project runs with the power supply of 12V, rectifiers are used for converting alternating current into direct current and bug converter is used to convert dc into dc. The Alexa is used as the user interface device which connected with Node MCU to execute commands.

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II. LITERATURE SURVEY

T.S.Karthick, K.Malini [11] proposed the work on voice based home automation using amazon dot. This project consists of raspberry pi and all devices are interacted with it through the respective relay. One important problem which is recognized to disclose in this methodology is that of smart less. Aqee Ur Rahman [13] proposed voice-controlled home automation for disabled people.In this system an intelligent home navigation system is proposed. This system has limitation of producing error due to environmental noise. Sitaram Pal [12] proposed the project on voice using automation of home. This is used with the help of speech command. This technique uses module of Bluetooth for controlling Works and transmitting data of loads. Limitation is less communication. Abdul Azz Md [8] did cost effective method of home automation. This system made with Arduino with Bluetooth module. M. Narendar [6] did a work Automation System using Raspberry pi via Email. The demerits in this project is using of Raspberry Pi 2 design B so that little number of devices are attached with it further more than single instruction given by the e-mail disturbs the other instructions. D. Pavithra et al. [9] proposed a project on automation using monitoring method of IOT and it uses the compact loads for the system user links. They could connect with gateway of internet, with the help of using ZigBee, Wi-Fi, etc. It cannot provide protection to their method and minimum components are used in this project.

III. TECHNOLOGY SERIES

This strategy uses several technical requirements and entrenched a good performance among them. Technological series is given as follows:

Physical layer: This is the touchable layer of the components with which system user interactive fiction happens

1) Node MCU -Empowered with Wi-Fi technology

2) Alexa -Alexa is AWS cloud-based platform. It is used with voice commands

Application layer: Here the following components are presents,

1) Alexa skill set - It is a kind of software developmental set for creating skills for Alexa

2) Amazon web server-Functionality which writes program when called slightly than fronting programs on side of server

Program layer - Arduino IDE is used here as coding language

IV. SYSTEM PROTOTYPE

a). System outline

The system given in figure 1 has, Node MCU, Solid state relay and Alexa. Now we will describe about every component.

b). Alexa voice service

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Alexa supports brilliant speech control service. The voice provokes the echo device. It operates with the help of natural language formulation technology provided by developer. After calls the Alexa, it processing the script in turns writes subroutine in Node MCU to switch on/off the appliances. After process is over, it gives the conformation back to Alexa.

c). ESP8266

Node MCU is cut price nonproprietary IOT strategy. It is the name of microcontroller developed by espressif system. Self-contained Wi-Fi offering as bridge between microcontrollers to Wi-Fi. This node consists of USB connector and assortments of pins.to interface MCU and Alexa we will use sinric. First you need to create an account, sinric is a website which is used to link our esp8266 with Alexa. After account is created login into it.

d). Solid state relay

It consists of sensors which provides responds to input. It has no moving parts. Hence no pit falls and carbon buildup while switch on/off the device.it is compact and life time is more. Once the node MCU gets connected with Wi-Fi, depends on the voice input it switches on and off the electronic appliances.

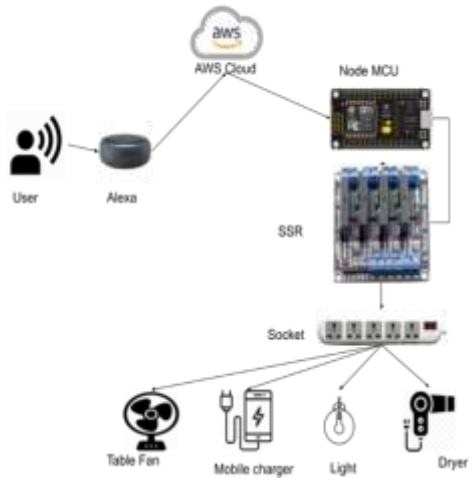

Figure 1. System design

V. WORKING

The voice information is given through Alexa. Echo voices result from discourse unit choice innovation. It can understand what the client is stating utilizing NLP calculations incorporated with the Echo's content to-discourse unit. The Echo equipment supplement incorporates a DM3725 ARM processor unit. It interfaces with the web through Wi-Fi. Configure Alexa and Node MCU using Alexa and sinric app. The Node MCU is connected to the same internet which relates to Alexa. Alexa writes scripts on the Alexa web server cloud, which is again makes

subroutine on Node MCU. After the node MCU is connected to the Alexa, connection with the relay is proceeding. Here solid-state relay is used. The solid-state relay has no movable parts. Hence pitfalls and carbon build ups are reduced. The Node MCU has set of input terminals which is connected to the input ports of solid-state relay. The output of relay relates to extension box, where we connect our appliances. Triggered the Alexa using a wake word called "Alexa", which in turns on/off the devices according to our commands.

VI. APPLICATION

Numerous smart devices are existing in market. Single smart socket in market costs more. Our product reduced the cost and provides four smart sockets in half of the cost of single socket available in market.

VII. CONCLUSION

Handling each of our appliances in home from one location is proposed through our project. This method embraces an interrelation between wireless communication and Node MCU. Elegant homes are a vast technique which contains multifarious mechanisms and application can be used to furnish security and control. Arduino IDE and ESP8266 is used to couple the method to the home.

VIII. OUTPUT

Figure 2. Experimental setup

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