EasyChair Preprint

№ 10170

Customized Power Socket for Non-Alexa Appliances

M S Nandini, Deepti Avadhani, G R Sinchana, A Yashaswi and M Sanjana

May 15, 2023

CUSTOMIZED POWER SOCKETS FOR NON-ALEXA APPLIANCES

Dr Nandini M S
Associate Professor, ISE Dept.
National Institute of Engineering
Mysore, India
nandini@nieit.ac.in

Deepti Avadhani
ISE Dept, NIEIT
National Institute of Engineering
Mysore, India
deepti.avadhani@gmail.com

Sinchana G R
ISE Dept, NIEIT
National Institute of Engineering
Mysore, India
sinchanagr02@gmail.com

Yashaswi A
ISE Dept, NIEIT
National Institute of Engineering
Mysore, India
yashaswiapya1@gmail.com

Sanjana Manjunath
ISE Dept, NIEIT
National Institute of Engineering
Mysore, India
sanjanamanjunath875@gmail.com

Abstract *– The proposed system mainly aims at building custom power sockets for non-Alexa Appliances using IoT and Amazon web service. So far Amazon has aimed to feature only customized Alexa products. Where in our project outcome will be in such a way that voice monitored control can be applied to non-Alexa products as well. This project is to develop custom socket to enable Alexa feature to non-Alexa devices with low cost and easy to setup. First and foremost, Alexa is designed around Amazon's own Echo devices. Alexa is Amazon's cloud-based voice service available on more than 100 million devices from Amazon and third-party device manufacturers. With Alexa, you can build natural voice experiences that offer customers a more intuitive way to interact with the technology they use every day. This consists of 2 main components. The first one is the four-channel relay model that allows the switching of current in the model. The other main component is Wi-Fi module through Wi-Fi module a web server can be added to the module which will help in controlling of devices over Internet.*

Keywords*- Alexa, NodeMCU 8266, Relay board, Socket, Voice-based, AWS, Cloud services.*

I. INTRODUCTION

The Amazon Echo is one of a range of hands-free speakers and devices from Amazon that can be controlled with your voice. The voice-controlled "personal assistant" on these devices is called Alexa, which will perform various tasks for you and control various systems. As well as being available on Echo devices from Amazon directly, Alexa [1,2,4,5,11] is available on a lot of third-party devices like speakers or TVs as well as through the Alexa app on phones. Alexa is also available in some cars and in some wearables. Devices designed by various companies to provide Alexa feature is too costly to buy, which is almost 300% to 500% times more than non-Alexa devices. The Amazon Echo range includes the Echo and Echo Dot, which are all speakers, and then the Echo Show models which also feature a display, so can give you visual feedback, like weather widgets, videos or song lyrics. There are several Amazon Alexa gadgets too, like the Echo Wall Clock and Echo Flex plug for example. All these devices feature far-field microphones that can pick out your voice through background noise and are waiting to take your command when they hear the Alexa wake word. Once you say this, Alexa will swing into action and respond to your commands.

II. EXISTING SYSTEM

In recent years, smart electronics have seen a rapid rise in the field of home automation and wireless digital technology, for example, Alexa services. But the high costs of these devices restrict many people to use the features of these technologies. Devices designed by various companies to provide the Alexa feature are too costly to buy, which is almost 300% to 500% times more than non-Alexa devices.

III. PROPOSED SYSTEM

The proposed concept involves the creation and integration of a customized IoT model with AWS services. The basic outline of the process includes creating an Amazon web service developer account, generating an Amazon API key, setting up access keys for both API and IoT [3,5,6,7,9,10] services, mapping IoT services/devices with the API key, and developing an IoT model. The next steps involve creating embedded 'c' code to access AWS services, setting up call-back services to access voice commands, verifying device IDs and commands, and finally controlling devices based on the received command.

IV. METHODOLOGY

The proposed system makes use of Alexa integrated with a Wi-Fi network which is configured in an ESP8266 Wi-Fi module.

The load (device) name which is to be addressed in the voice command is registered in the ALEXA Server. This eliminates the need to frequent reconfiguring of Wi-Fi using the ALEXA app. This is done by registering a Wi-Fi name in the ESP node and the Alexa cloud server so that it automatically connects itself to the Wi-Fi. The working of the block diagram is shown in figure. The 230 V supply is rectified, filtered and made it to operate the relay [6,7] . The Echo dot is always ON waiting for the wake word. The voice command gets processed through Alexa cloud server. Alexa cloud server has an inbuilt Voice recognition system known as Alexa Voice Service. The commands from the cloud are received by the ESP8266 [6,7] which processes the command and activates the relay. Every device is given a name inside the Node MCU[1,8] through programming. Every time the command is passed, the data is recognized from the registered server through the internet and the proper relay is activated.

V. SYSTEM DESIGN

DATA FLOW DIAGRAM

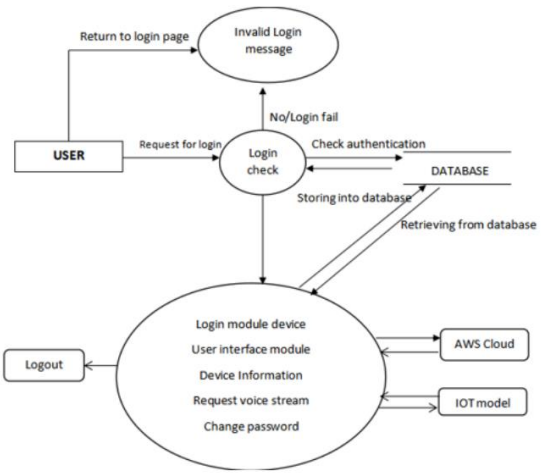

Fig 1. Data flow diagram

CIRCUIT DIAGRAM

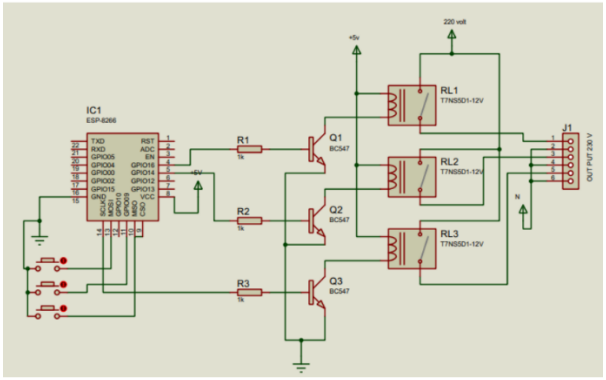

Fig 2. Circuit diagram

VI. SYSTEM WORKING

The device name which has to be controlled is pre-programmed and registered in the ALEXA server. So every time, we call upon the device name to be turned on and off, ALEXA gets its information from its Server through the internet connection. When we give the Wake word “ALEXA”, the device (Echo dot) gets ready to accept the command which is indicated by the blue circular light. When we give the command such as “Alexa, turn on the light” or in some similar manner which is recognized by its advanced AI system, the command gets processed through the Server and the processed signal is transferred to the ESP8266. The ESP8266 is registered with the APP KEY to enable connecting to the phone and the Wi-Fi and to help in auto connection to the Wi-Fi, a SSID name and its password is registered in the ESP module. Each ESP is distinguished from one another by its APPKEY. The command gets received by the ESP8266 and the command gets interfaced with the programming of the ESP module. Based on this, the relay gets turned ON. The Command signal irrespective of the load device activates the load. They operate irrespective of the voice of the user and it is greatly useful in Automation system in offices. By simply connecting to a Wi-Fi network whose name can be configured in the ALEXA cloud server, automation of appliance becomes easier.

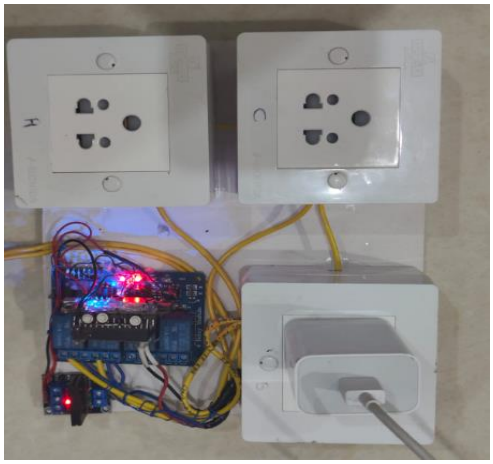

Fig 3. Project outlook

Fig 4. Working Model

VII. CONCLUCION

The paper suggested a method to make Alexa compatible with smart homes and to facilitate the integration of the Service Platform Oriented and Device Cloud Oriented architectures using IoT [3,5,6,7,9,10] . Using Sinric Pro, users can use voice commands to switch on and off their household appliances. This system can be effortlessly expanded to remotely operate household appliances via smart devices such as iPhone, iPad, and other mobile phones. This allows users to remotely monitor the status of their appliances and turn them on or off as desired. While the current proposal caters to three household appliances, it can be effortlessly scaled up to include additional appliances.

REFERENCE

[1] K. Loga Priya1, Mrs. S. Saranya2 presented a paper on "Voice-Activated Home Automation using NodeMCU" 2020.

[2] Chan Zhen Yue, Shum Ping presented a paper on "Voice Activated Smart Home Design and Implementation " 2019.

[3] Amrutha, Aravind, Ansu Mathew, Swathy Sugathan, Rajasree R , Priyalakshmi S presented a paper on "Voice Controlled Smart Home" 2019

[4] Archiev Kumar presented a paper on "AlexaPi3- An economical Smart Speaker" 2018.

[5] Jaishree H. Achegave, Associate Prof Sharda. S. Killarikar presented a paper on "Iot Based Raspberry Pi Home Automation System Using Amazon Dot " 2018.

[6] Aayush Agarwal, Anshul Sharma, Asim Saket Samad, S Babeetha presented a paper on "UJALA- Home Automation System Using Google Assistant " 2018.

[7]Komal Nikure, Prof. Ashish Manusmare presented a paper on " Dynamic Digital Assistant using RasberriPi " 2021.

[8] Saurabh Singh, Harjeet Matharu And Dr. Sangeeta Mishra presented a paper on " IoT based home automation system" 2018.

[9] G S MD Waseem Akram, Dr. Prahalada Rao presented a paper on "A smart switch to connect and disconnect electrical devices at home by using internet" 2019.

[10] Dr. Sanjay Pokle, Saurabh Srivastava, Shobhit Shrivastava, Spandan Shrivastava presented a paper on " Voice Controlled Home Automation System - A Smarter Approach " 2021.

[11]Cu PHAM, Yuto LIM and Yasuo TAN presented a paper on " A Platform for Integrating Alexa Voice Service Into ECHONET-based Smart Homes " 2018.