Alexa Powered Smart Hardware Unit Using Aws Cloud

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Abstract- *Amazon Alexa, known as Alexa is a virtual assistant developed by Amazon. In this paper we demonstrate Alexa as an home automaton device to control/operate few household devices through voice commands. As a whole Internet of Things (IoT) was highlighted because the device which we control through Alexa are Internet connected by some cloud services called IFTTT, Adafruit and AWS cloud. We can control devices remotely from anywhere through internet connected cloud services*

Problem Statement and Proposed solution: *Power consumption is being the biggest problem now a days due to more and more usage of electrical/electronic devices, also lack of efficient resources making people to move towards energy efficient technologies. Therefore an voice automated system powered by cloud services could not only allow the user to control the devices through internet from anywhere but also in the end reducing power consumption.*

Keywords- Alexa, home automation, Cloud services, Voice control, IoT (Internet of Things)

I. INTRODUCTION

In modern days we see many smart enabled devices like automatic doors and automated fans through sensor responses. But our objective is to convert conventional or regular devices like fans, lights etc., into smart devices by connecting them to a specialized hardware unit called NodeMCU, which is an open source device having an in- built Wi-Fi module (ESP8266). NodeMCU creates a connection and acts as an interface between device and user through internet.

An interface device (IDF) is a hardware component or system of components that allows a human being to interact with a computer, a telephone system, or other electronic information system.

FIG 1 : NodeMCU Board

Here we are using NodeMCU as an IDF. **NodeMCU** is an open source IoT platform. It includes firmware which runs on the ESP8266 Wi-Fi SOC from Express if Systems and hardware which is based on the ESP-12E module.

II. HARDWARE IMPLEMENTATION.

In implementation of this project we have used an 8-channel relay module for switching each devices connected to the NodeMCU through internet, which can be observed in the below block diagram.

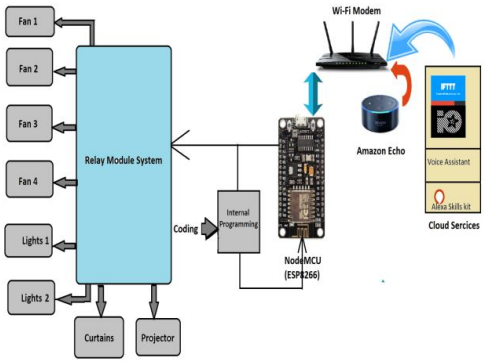


FIG 2: Block Diagram of the Project

When a voice command is triggered by Alexa then it sends response to the NodeMCU, having internal code

dumped in it. Then NodeMCU switches corresponding relay and in result switching on the device we wanted.

III. CLOUD SERVICES

MQTT PROTOCOL: MQTT (Message Queuing Telemetry Transport) is a lightweight messaging protocol that provides resource-constrained network clients with a simple way to distribute information. The protocol, which uses a publish/subscribe communication pattern, is used for machine-to-machine (M2M) communication and plays an important role in the internet of things (IoT).

IFTTT PROTOCOL: If This Then That, also known as IFTTT, is a free web-based service to create chains of simple conditional statements, called applets.

Both the cloud services MQTT Protocol and IFTTT are used to establish communication between devices and the end user. You can create an Applet for personal use on IFTTT.com using the Applet creation tool or on the mobile Apps.

With hundreds of partners building on the platform, there's no shortage of creative and useful Applets on IFTTT. You can connect services, browse them, and turn on any Applet that interests you with a simple switch

ADAFRUIT.IO : Adafruit.io is a cloud service -You can connect to it over the Internet. It's meant primarily for storing and then retrieving data but it can do a lot more than just that!

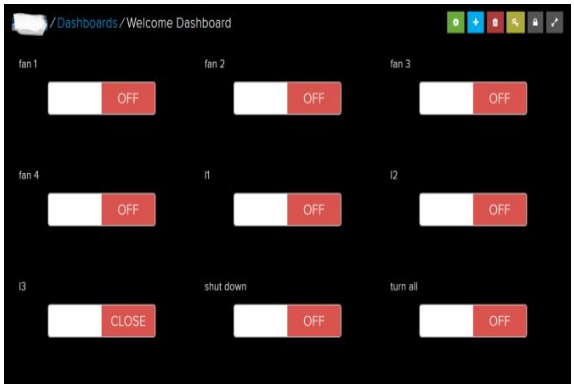
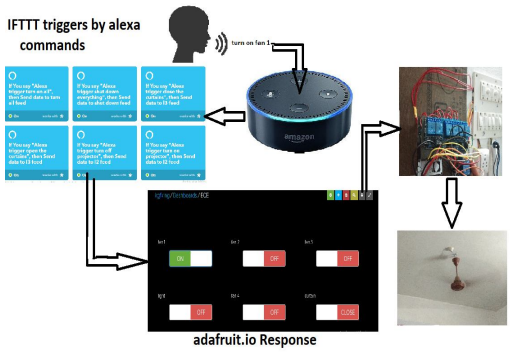


FIG 3 : Adafruit Dashboard

Display your data in real-time, online, Connect projects to web services like Twitter, RSS feeds, weather services, etc.,.The best part? All of the above is do-able for free with Adafruit IO.

IV. RESULTS



V. FUTURE SCOPE

Internet of Things (IoT) is a growing technology and could change the digital world to great possibilities. Therefore there is a hope that in future may be we can all see a complete IoT controlled rooms, schools, hospitals etc., which will be a energy efficient and also future changing Technology for the next generation to come.

VI. CONCLUSION

By this we can conclude that we successfully demonstrated controlling household devices like fans, lights, projector etc., using our voice commands through Alexa, a virtual voice assistant device. Also in real time we can actually operate them through Cloud with the help of adafruit.io helps us to operate our devices anywhere through Internet thereby reducing the chance of power consumption and also man power too.

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