



“VOICE ACTIVATED HOME AUTOMATION SYSTEM USING NODEMCU 8266”

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ABSTRACT

The rise of automation technologies has made life easier in every way. In the modern world, automatic systems are favoured over manual once. IOT is the newest and most cutting-edge internet technology. The exponential growth in internet users over the past ten years has made the internet a necessary component of daily life. The internet of things is an expanding network of commonplace items, including consumer goods and industrial machinery, that can exchange information and carry out tasks while you are occupied with over thinks. An automated home is frequently to as referred a smart home. A wireless (HIS) employing the (IOT) enables computers or mobile devices to control basic home features and operations automatically from anywhere in the globe. It is intended to conserve both human and electric energy. The feature that sets the home automation system apart from other systems is that it controlled online from any location in the world. This article describes a home automation system (HAS) that use the MIT app Community and integrates cloud networking, wireless communication, and data storage to give users remote control of different light, fan, and appliance in their homes. Based on the information provided by the sensors, the system will adjust itself. This system's inexpensive cost and expendability make it possible to control a range of devices.

Keywords: Home Automation, Node MCU, Esp8266 Wi-Fi Module, Relay, IFTTT Smart Phone, Google Assistant.

PROBLEM STATEMENT

People today are looking for ways to improve their lifestyle by utilizing the most recent technologies. Customers will purchase any new home appliance feature that promises to improve their quality of life. It becomes inevitable to have simple and practical technique and means to control and operate these appliances when more of these facilities and appliances are added. Traditional wall switches must be manually turned on or off in order to operate multiple appliances due to the fact that they are spread out across the house. Monitoring the performance of running appliances and keeping track of them becomes nearly difficult. Another goal is create a system that makes it easier to operate home appliances, such as using speech recognition or mobile devices.

INTRODUCTION

We can operate hardware through the internet thanks to a new technology called IOT, or the internet of things. Here we suggest using IOT to automate modern homes by using the internet to control household equipment. This technique employs four loads to show how to control home appliances. A user can simply control these household appliances. Via the internet anywhere in the world thanks to our user-friendly interface. We utilise Node MCU (Node Micro-controller Unit) for this system. To receive user commands through the internet, this micro-controller is connected to a relay module. To switch loads, relays are employed. A Micro-type 5V Adapter/Charger powers the entire system.

Node MCU interprets user commands received over the internet control the loads in accordance with these instructions and present the systems status on a smart phone display. As a result, this method enables effective home automation over the internet.

We used the MIT Community Applications in this to remotely operate home appliances everywhere. Swiping the figures on a smartphone or using Google Assistant's voice control are the methods used for control. Next, we employed the most recent method, the IFTTT platform & Web Hooks, to trigger our circuits. As soon as the Google Assistance receives a command, it will start the circuit.

EXISTING SYSTEM

Systems for automating the home that use Bluetooth, an Arduino board, and a smartphone serves are safe and affordable. A computer or smartphone serves as the receiver device in the Bluetooth system. It can function as a real-time system because of its fast transmission rate, excellent security, and inexpensive cost.

One of the primary drawbacks of Bluetooth-based home automation systems is their limited range of 10 meters. which prevents smartphones from controlling appliances if they are outside of range.

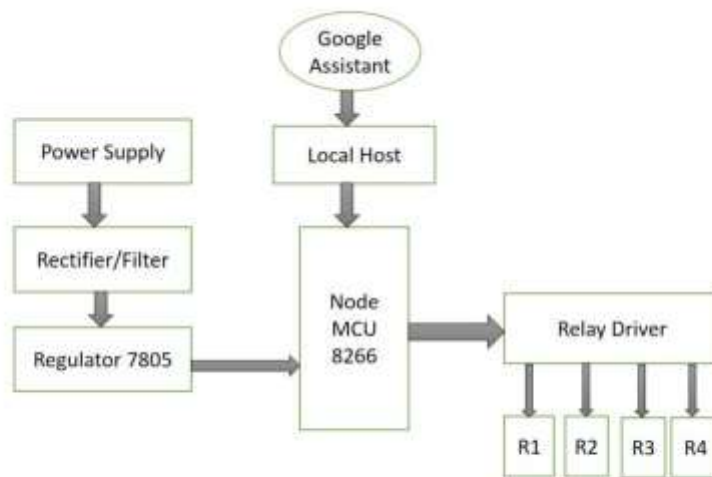
MOTIVATION

This lesson focuses on voice-activated IOT based HIS Node MCU an Android. Similar IOT based HIS projects that used a Node MCU web server to control relays have been build by us in the past. In order to control household appliances from a web browser, we used A sync web server. However, using MIT App Inventor today, we will create our Android app for home automation.

Install it on Android phones so we may use voice controls in addition to buttons to operate our home appliances.

Using this as a foundation Internet of Things-based voice-controlled home automation project, you can connect a 2/4/8 channel relay to a Node MCU ESP8266 and control various appliances, including lights, fans, air conditioners, pumps, and more. We'll utilise an Andoid application with multiple ON/OFF buttons and a voice-activated mechanism to communicate with Node MCU and control the relay output. We will give the Node MCU an IP address. Because access control requires that our Android phone and Node MCU be linked to the same network. As a result, to project is likewise LAN-based.

SYSTEM ARCHITECTURE



ESP 8266

Built around a very affordable System-on-a-chip, the Node MCU (Node Microcontroller Unit) hardware development environment. Dubbed the ESP8266 (SOC). The ESP8266, created and produced by Express, includes all essential components of a contemporary computer, including a CPU, RAM, networking (Wi-Fi), and even a contemporary operating system and SDK. The ESP8266 chip costs only \$2 USD per unit when purchased in bulk. It is therefore a fantastic option for this system design. The Node MCU seeks to make ESP8266 development simpler. It has two essential parts.

- 1) An open source ESP8266 firmware development on top of the exclusive SDK of the chip maker. The Firmware offers a straightforward programming environment built on Lua (embedded Lua), a relatively straightforward and quick scripting language with a thriving development community. The Lua scripting language is simple to learn for newcomers. Additionally, Node MCU can also be developed using the Android IDE.
- 2) A development kit board with an ESP8266 chip mounted on a regular circuit board. The board contains a hardware reset button, a Wi-Fi antenna, LED lights, and standard-sized GPIO pins that can be plugged into a bread board in addition to an integrated USB port that is already connected up with the chip. The development board for Node MCU is depicted in Figure.



RELAY BOARD

An electromagnetic switch is a relay. When a little current of a few micro-amperes is supplied to it, it activates. In a circuit, a relay is typically employed as a form of switch, an automated switch. Relays come in a variety of varieties, and they run at various voltages. When designing a circuit, the voltage that will activate it must be taken into account. The relay circuit is utilized in this system to turn the applications ON and OFF. The Node MCU micro-controller provides the high/low signal. An appliances relay is switched between being both on and off when a high voltage is applied to it.

The figure below displays the circuit used to power four appliances in the home automation system. Depending on the needs of the user, the quantity of appliances can be changed.



WORKING OF PROPOSED SYSTEM

Node MCU is used to implement the suggested system, which eliminates all of the shortcomings of earlier techniques. All in this project's sensor are linked to the Node MCU board, and the results are shown on a smart phone.

This low-cost system handles both home automation and security with the bare minimum of requirement. More beneficial for elderly and disabled persons.

SYSTEM IMPLEMENTATION PLAN

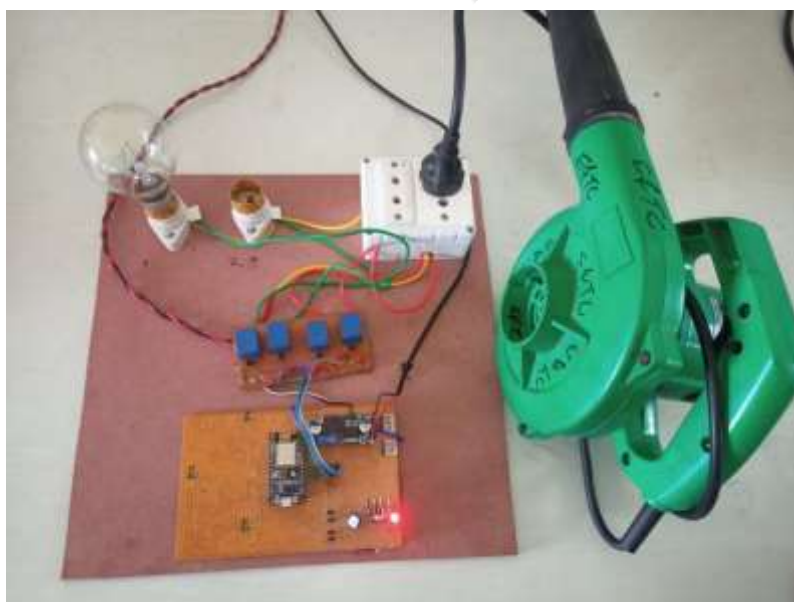
The device is capable for establishing a connection with the router, additionally, it would be able to turn on and off particular device, such lights and fans. The 'control unit' is what it is known as, additionally, the local host server, MIT app and google assistant make up the design's software, and these application would be integrated into android device.

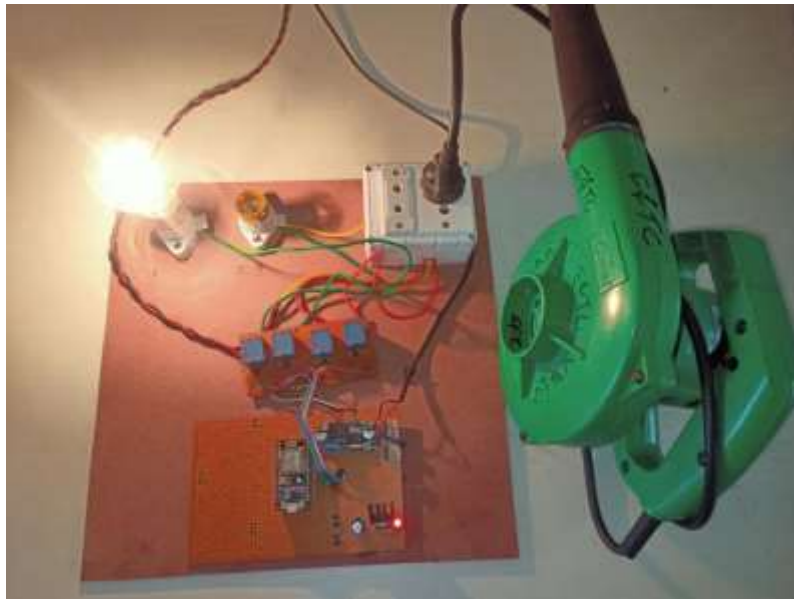
The microcontroller Node MCU and 4/8 channel relay board make up the control unit. The relays are controlled by IC on the relay board. An android device's android app connects to the micro-controller and uses the internet to transmit the appropriate signal, below the fundamental system design architecture.

RESULT

The outcomes as favourable, and the system performed effectively. The suggested system's full prototype implementation as depicted in the diagram below.

OFF CONDITION:



ON CONDITION:

NOTE: 5V/1A Output, Mobile, Chargers where used to power the Node MCU and the relay board.

CONCLUSION

We have learned a lot about the many module employed in this venture while putting effort into it. We are happy to have been able to built this project and establish new musings as apart of this attempt. We think the task is over.

Data controlled during this time will be used in our feature company life as needed. We should also mention that home computerization will determine how the feature world's locations turns out. A resources that can automate the home environment is home automation. Electrical device can be controlled by through, smart phone This home automation technology is configured with mobile controls. These products may have a significant marketing potential in the future.

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