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Design and Implementation of Real Time Voice Control Home Automation using IOT for Physically Challenged

Saminathan . K[1] , Vijayasarathi.N[2] ,Gopal . R[3], Suresh.T[4]

UG Student[1], Assistant Professor[2], UG Student[3], UG Student[4]
Department of Electrical and Electronics Engineering
Saranathan College of Engineering

***Abstract*—** This is the project for a voice controlled home automation system to control appliances with the user voice and to view whether lights and other electrical appliances are on or off through an Android application. This system is especially beneficial in case of handicapped or aged people who find it difficult to walk and operate the electrical switches to turn on or off the loads. An Arduino mega board is used for controlling the relay through which an appliance is switched on/off the loads. ESP8266 Wi-Fi chip with microcontroller is used to send the status of electronics (on/off) to the mobile through internet. Here 4 loads are used to demonstrate. All these loads can be individually turned ON/OFF or all loads at the same time based on the input received from android application. User can modify the android app to add more functions.

Index Terms— Internet of thing (IoT), Power consumption, Smart devices, Home automation, Security, Android

I.INTRODUCTION

Today people are looking at ways and means to better their life-style using the latest technologies that are available. The more new facilities and appliances are added, it becomes inevitable to have easy and convenient methods and means to control and operate these appliances. Conventional wall switches are located in different parts of a house and thus necessitates manual operations like to switch on or off these switches to control various appliances. It gets virtually impossible to keep track of appliances that are running and also to monitor their performances. Also monitoring and controlling the appliances need some movement and physical contact. Thus, this will be a burden to disable person especially for the disabled and elderly people.

II.IMPLEMENTATION

Our project uses a mobile application to interact with these Wi-Fi signals emitted from these appliances. The application ends out instructions to the Arduino boards and also responds to the feedback from them. When any command is sent from a remote place, the Arduino boards receive them from the Wi-Fi router which they are connected to when they are connected through to the mobile device. The Internet of Things (IoT) has immense potential to change many of our daily activities, routines and behaviors.

The persistent characteristic related toInternet sources means that a large amount of data relating to almost every facet of human activity, both communal and private will be produced, transmitted, collected and stored. Consequently the integrity and confidentiality of the communicated data as well as the authentication of the services offering that particular data is crucial. Hence security is a critical functionality of the IoT. So we provide an authentication process in the mobile application that involves the use of a username ada password.

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Node mcu8266

FIG: 1 NODEMCU8266

The NodeMCU development board is a powerful solution to program microcontrollers and be part of the Internet of Things (IoT). The NodeMCU development board, based on ESP8266EX, is a cute module with a microcontroller, integrated Wi-Fi receiver, and transmitter. NodeMCU supports several programming languages; hence, it is very easy to upload programs from any computer over a micro-USB port. I have been playing with the NodeMCU for quite a while now and, I have to say, it is a lot more fun than the other available IoT modules. When it comes to prototyping — just another perfect, relatively cheap, easy-to-learn, and user-module

III. PROPOSED SYSTEM

Our project aims to provide the most easy and efficient way to interact with home appliances by giving voice commands in human (natural)language. We plan on eliminating the tedious
process of clicking through various application screens with just one voice command. The natural language processing in the project provides a personal connection with our system. Primarily the user is authenticated by entering the specified username and password in the mobile device. The user sends a voice command to the mobile device, which interprets the message and sends the appropriate command to the specific appliance. The voice command given by the user is interpreted by the mobile device using Natural Language processing. The mobile device acts as a central console; it determines what operation must be done by which appliance to fulfill the user's request. The central console can also be either a desktop application, web application or a smart phone application as all of the data transferred can be processed by the cloud. However, for the convenience of the user and increased mobile capabilities we will be using a smart phone in this project. The appliances are connected to the mobile device through an Arduino Board that establishes the concept of Internet of Things. The Arduino Boards are interfaced with the appliances and programmed in such a way that they respond to mobile inputs. Our project automates the operation of every single appliance in the house, which greatly reduces the power consumption due to excess use/wastage of the appliance's services

IV. EXISTING SYSTEM

The existing technologies, in these regard are far outdated than what we have proposed. Most of the smart home automation systems that are existing only automate the basic process of changing the state of the appliances to ON/OFF. There are many smart home mechanization systems in the market that aim to automate the basic operations of these home appliances using various technologies such as GSM (Global System for Mobile), NFC (Near- Field Communication) and the Wi-Fi.
The existing smart home systems that have either been implemented or proposed have an elaborate procedure to interact with the home appliances. Some include pressing a button in a static location while some others include giving commands through a mobile device. Various technology companies have been trying to create amazing products in the department of home automation system since a decade ago. However, the Internet of things has become a briskly growing field only in the recent past. Many viable consumer products are being sold by various technology giants in order to bring the technology to the common man. Most of these gadgets have been released during the course of this year, some of them include: Amazon Echo, Apple Home Kit and Google Home. However none of these systems aim to possess omnipresence or include artificial intelligence to predict the user's commands.

V.TESTING

Did you know? It's very easy to use the Arduino IDE to program your NodeMCU, a great starting point for Arduino lovers to familiarize themselves with the technologies surrounding the IoT. Note that when you use the NodeMCU board with the Arduino IDE, the Lua firmware will be deleted and replaced by the sketch uploaded by you. If you want to use the Lua SDK again, it will become necessary to "flash" the firmware again. The NodeMCU programming can be as easy as in Arduino. The major difference is in the pin assignment of the NodeMCU board. Ready? Then follow these steps:

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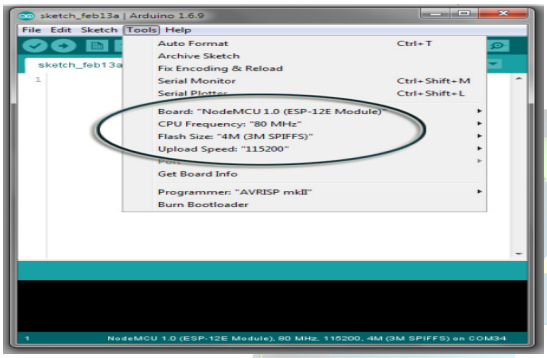
- Run the Arduino IDE
- Open the "Preferences" window and type the indicated address in the "Additional Board Manager URLs:" In the "Tools" menu, configure your board "NodeMCU 1.0 (ESP-12E Module)"
- Now just proceed as the Arduino: Start your sketching!



Shown next is an example code to realize a "breathing LED" on NodeMCU, taken from Arduining.com

Relay driver circuit

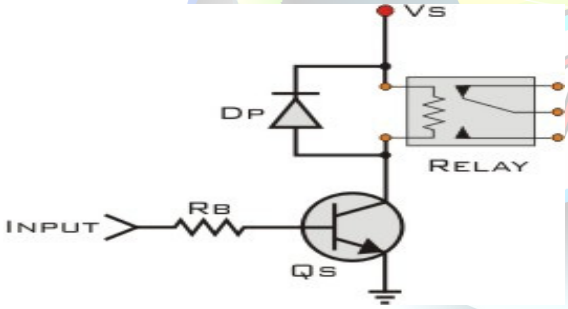


FIG: 1.2 Relay Drives

In order to drive the relay, we use transistor and only less power can be possibly used to get the relay driven. Since, transistor is an amplifier so the base lead receives sufficient current to make more current flow from Emitter of Transistor to Collector. If the base once gets power that is sufficient, then the transistor conduct from Emitter to Collector and power the relay.

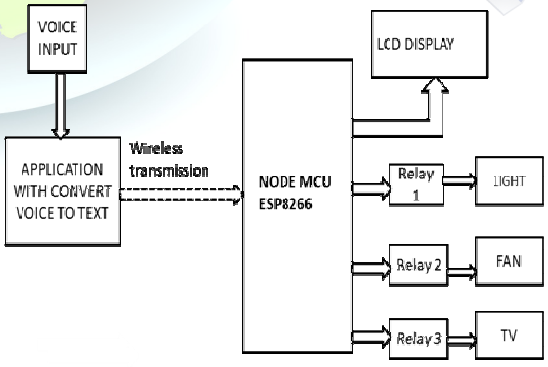
The Transistor's emitter-to-collector channel will be opened even though no input current or voltage is applied to Base lead of Transistor. Therefore, blocking current flows through relay coil.The emitter-to-collector channel will be opened and allows current to flow through relay's coil if enough current or voltage is applied as input to the base lead. AC or DC Current can be used to power the relay and circuit.Relays are electromagnetic devices which allow low-power circuit to switch a high current ON and OFF switching devices with the help of an armature that is moved by an electromagnet.

Driver Circuit is used to boost or amplify signals from micro-controllers to control power switches in semi-conductor devices. Driver circuits take functions that include isolating the control circuit and the power circuit, detecting malfunctions, storing and reporting failures to the control system, serving as a precaution against failure, analyzing sensor signals and creating auxiliary voltages.

RELATED WORKS

The industry and the Academicians have worked together in perfect harmony to make great advancesin the field of Home Automation Systems. Manytechnology giants including Apple, Amazon andGoogle have been keen on making viable consumerproducts for the common man. Most of thesegadgets have been released during the course of
this year, some of them include: Amazon Echo,Apple HomeKit and Google Home. However noneof these systems aim to possess omnipresence orinclude artificial intelligence to predict the user's comments.

VI. BLOCK DIAGRAM



FIG; 1.3 Block diagram

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EXPLANATION

The home automation gives access to control devices in your homes then voice input on micro phone .The term may be used for isolated programmable devices lights, appliance ,electrical outlets, heating and cooling systems Store the programme on node mcu8266 and contain the cloud Systems and towards the load used.

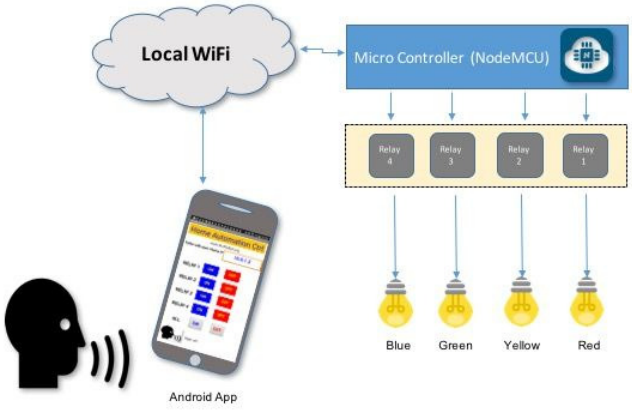
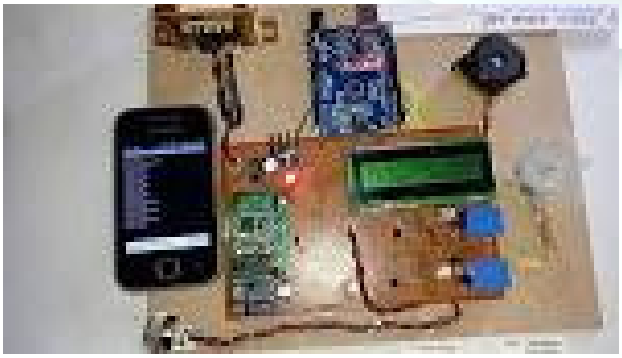
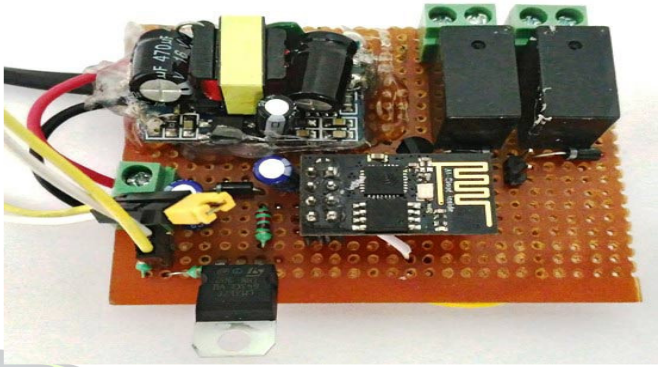


FIG:1.4

Other home automation systems insist on usingArduino boards as the only solution. Most of thesesystems can also be replaced by either ZigBee,Raspberry Pi or any other programmable board astheir functionalities are not altered. These systemsalso have a heavy duty reliance towards using mobiledevice as their central console alone, giving veryless flexibility of changing this sources

VII .OUTPUT





VII. CONCLUSION

We can improve this basic system functionality by providing additional modules and services such as smart entry control subsystem, human behavior patterns learning and monitoring, remote access system control, configuring and controlling system configuration over Smartphone or tablet etc. In future, we need to upgrade this system with a real server and some security related algorithms. This system can be expanded to include various other options which could include home security feature like integrating camera module and capturing the photo of a person moving around the house.Thus home technology across the globe are transforming rapidly and on a track of continuous development in order to provide the end users with ease and convenience to their lives. These automation solutions are constantly evolving at present in terms of efficiency, ability, and overall performance. . In this project, the proposed architecture and components were well chosen both in terms of achieving the low cost of the overall solution and satisfactory system performance. Thus this system can provide great assistant to the physically challenged people without any third person's assistances.

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