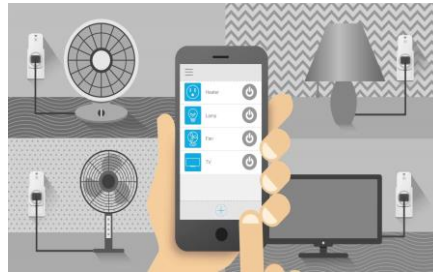


**A
Project Report
On
"Control home appliances with smart devices"**



Prepared by
Kartik Sutariya(17CE122)
Keyur Talati(17CE124)
Vedanshu Trivedi(17CE129)

Under the guidance of
Prof. Amrin Shaikh

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Submitted at



U. & P. U PATEL DEPARTMENT OF COMPUTER ENGINEERING

Faculty of Technology & Engineering, CHARUSAT

Chandubhai S. Patel Institute of Technology

At: Changa, Dist: Anand – 388421

October 2018

CERTIFICATE

This is to certify that the report entitled “**Control home appliances with smart devices**” is a bonafied work carried out by Kartik Sutariya(17CE122),Keyur Talati(17CE124) and Vedanshu Trivedi(17CE129) under the guidance and supervision of **Prof. Amrin Shaikh-Banu** for the subject **Software Group Project (CE244)** of 3rd Semester of Bachelor of Technology in **Computer Engineering** at Faculty of Technology & Engineering (C.S.P.I.T.) – CHARUSAT, Gujarat.

To the best of my knowledge and belief, this work embodies the work of candidate themselves, has duly been completed, and fulfills the requirement of the ordinance relating to the B.Tech. Degree of the University and is up to the standard in respect of content, presentation and language for being referred to the examiner.

Under the supervision of,

Prof. Amrin Shaikh-Banu
Assistant Professor,
U. & P U. Patel Dept. of Computer Engg.
C.S.P.I.T., CHARUSAT-Changa.

Dr. (Prof.) Amit Ganatra
Dean,
Faculty of Technology & Engineering
Head, U. & P U. Patel Department of Computer Engineering
C.S.P.I.T., CHARUSAT- Changa, Gujarat.

Chandubhai S Patel Institute of Technology (C.S.P.I.T.)

Faculty of Technology & Engineering, CHARUSAT

At: Changa, Ta. Petlad, Dist. Anand, PIN: 388 421. Gujarat

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ABSTRACT

Internet of things (IOT) conceptually the idea of remotely connecting and monitoring real world objects threw the internet .when it comes to our house this concept can be aptly in corporate to make it smarter, safer and automated. This IOT project focuses on building a smart wireless home security system that sends alerts to the owner by using internet in case of any trespass and raises and alarm optionally. Besides the same can also be utilizes for home automation by making users the same sat of sensors.

Now days the people want some comfort, safety, convenient and compatibility. To achieve all of these demands first of user have to download an android application from which he can control electric home appliances like fans and lights.

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CHAPTER 1

Introduction

1.1.PROJECT OVERVIEW

Smart home is one of the recent fields in the context of computer science. The paper named as “Remote mobile control of home appliances” by F. Meija, M. Nikolova and P. Voorwinden depicts on the home controlling using WAP protocol. The architecture mentioned by them is much complex but it gives an initial idea about the remote home appliance controlling.

Smart home studies sometimes affected by the concern about the possible harms to the humans’ health. A great research was done by Toril Laberg, Directorate for Health and Social Affairs of the Delta Centre, Norway. He later publish in his paper named “Smart Home Technology: Technology supporting independent living - does it have an impact on health?” that there is no harm on humans’ health by the technical setup required to support smart home technologies.

Recently some projects are organized for building the architecture of controlling home appliance using voice commands. VoiceXML is used for that purpose.

In this instrutable we will be making a simple IOT project . Web page and android application connoled led using NodeMCU

1.2.PURPOSE

This section outlines the criteria that will be considered in the development of the control system.

1.2.1 FUNCTIONAL REQUIREMENTS

- The following is a list of functional requirements of the control unit/module.
- The Cellular Unit will have the ability to connect to the cellular network automatically

1.2.2 CONSTRAINT CONSIDERATIONS

The following is a list of constraint considerations:-

- The controlled appliances will need an electrical control interface.
- This simple system is only capable of controlling electrical devices.

1.2.3 TECHNICAL APPROACH

Assuming that the control unit is powered and operating properly, the process of controlling a home device will proceed through the following steps:-

- The remote user makes a call to the GSM cellular unit and commands to the receiver.

- GSM receiver receives call automatically from user cell phone by auto answering mode.
- After receiving call by GSM cellular unit user press the keys on his cell phone.
- GSM receiver receives the appropriate DTMF tone.
- The DTMF decoder IC connected to GSM receiver detects the pressed DTMF tone & converts it to the 4 bit BCD O/P.
- DTMF decoder IC sends the BCD O/P to the microcontroller.
- Microcontroller issues commands to the appliances via relays connected to its O/P ports.

1.3. SCOPE

This Project is of area of interest is remote control of home appliances using the internet. This project will focus on the remote control of a fan, a light and a television set (TV). With a fan and a light, switching on and off will be considered. And for a TV, in addition to switching on and off, changing of channels will be considered.

1.4. OBJECTIVE

To design an internet based home automation system for controlling home appliances.

- To analyze and identify the weaknesses of existing home automation systems
- To design a flexible internet based wireless home automation system
- To simulate and test the designed system

1.5. TECHNOLOGY AND LITERATURE REVIEW

Home automation

Home automation is the residential extension of building automation. It is the automation of the home, housework or household activity.

Internet

The Internet, sometimes called simply "the Net," is a worldwide system of computer networks - a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers). The Internet is now widely used as a connectivity tool for educational, commercial, and personal applications. The Internet is an exciting portal that makes it possible for users to access virtually an infinite supply of information.

Remote control

Remote control is the control of an activity, process, or machine from a distance, as by radioed instructions or coded signals.

CHAPTER 2

SYSTEM ANALYSIS

2.1 USER CHARACTERISTICS

- Increase your independence and give you greater control of your home environment.
- Make it easier to communicate with your home appliances
- Save you time and effort.
- Improve your personal safety.
- Alert you audibly and visually to emergency situations.

2.2 TOOLS & TECHNOLOGY

Software:-

- Arduino IDE



Figure 2.1 – Arduino IDE

- Mobile Application.

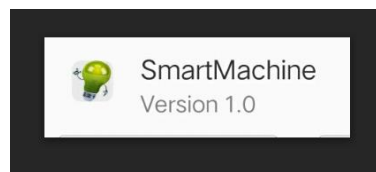


Figure 2.2 – Mobile Application

We have make our personal android application for this project .

This application made in Mit Inventer and with the help of PHP

-Hardware:

➤ NodeMCU

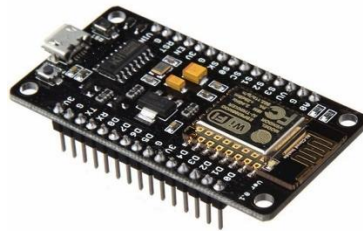


Figure 2.3 - NodeMCU

➤ USB cable



Figure 2.4 – USB cable

➤ Jumper Cables

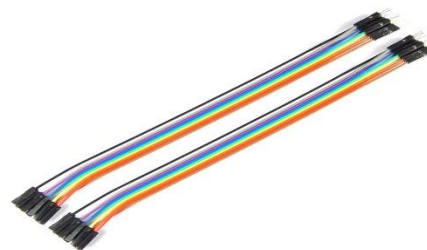


Figure 2.5 -Jumper Cables

- Regular Size Bread Board



Figure 2.6 – Bread Board

- Relay module.

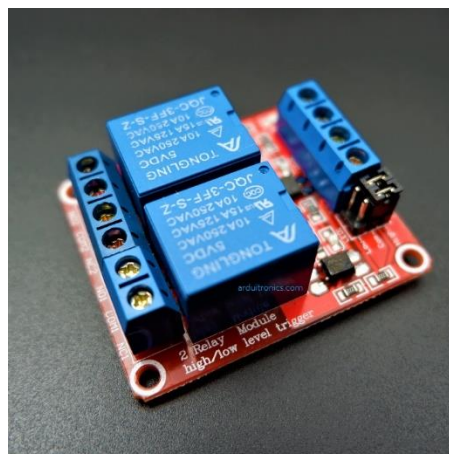


Figure 2.7 – Relay Module

CHAPTER 3

SYSTEM DESIGN

3.1 FLOW OF SYSTEM

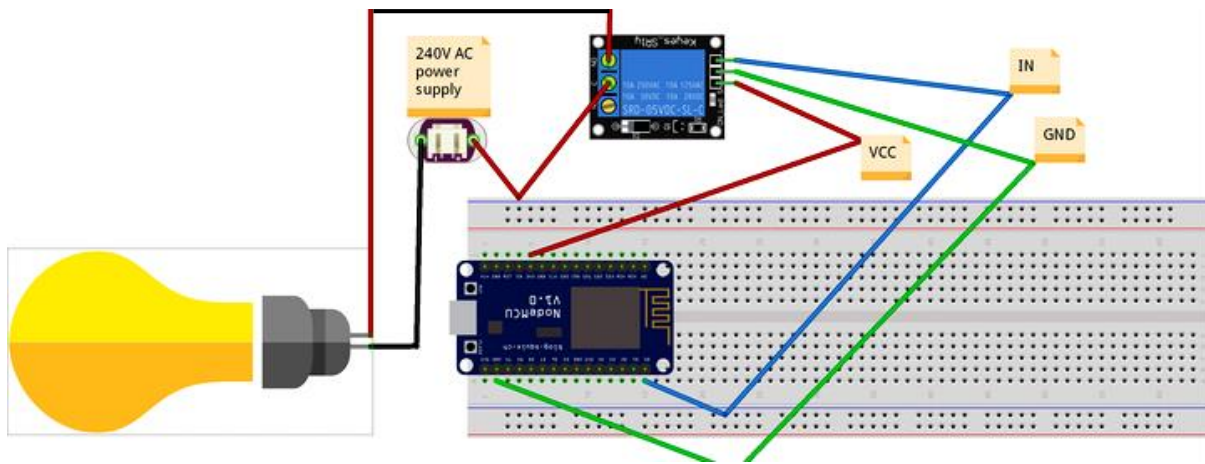


Figure 3.1 – Circuit Diagram

3.2 MAJOR FUNCTIONALITY

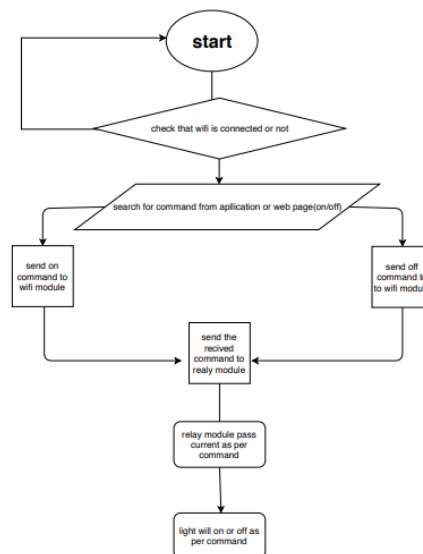


Figure 3.2 – Flow Chart

CHAPTER 4

IMPLEMENTATION

4.1 IMPLEMENTATION ENVIRONMENT

This project is single user as well as multiuser nonGUI as command can be sent to one or more owners.

4.2 MODULE SPECIFICATION

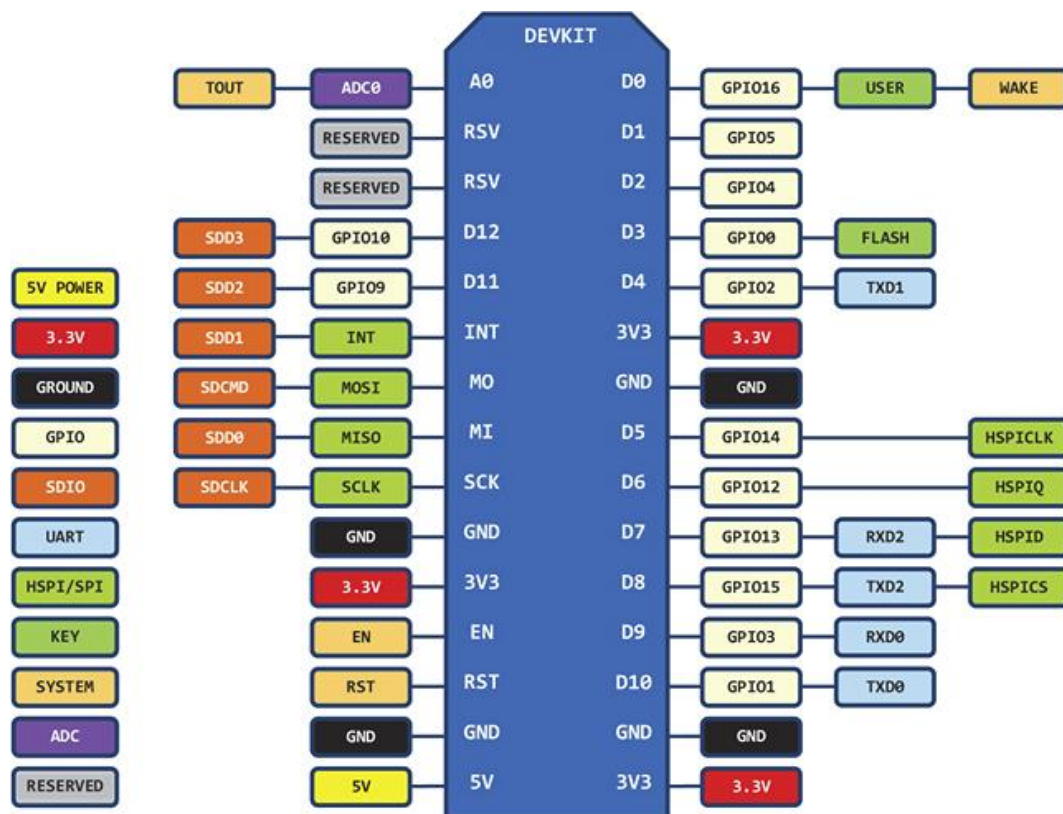


Figure 4.1– NodeMCU Configuration

IO index	ESP8266 pin	IO index	ESP8266 pin
0 [*]	GPIO16	7	GPIO13
1	GPIO5	8	GPIO15
2	GPIO4	9	GPIO3
3	GPIO0	10	GPIO1
4	GPIO2	11	GPIO9
5	GPIO14	12	GPIO10
6	GPIO12		

Figure 4.2 – NodeMCU Pin Configuration

4.3 CODING SPECIFICATION

```

1 #include <ESP8266WiFi.h>
2 #include <ESP8266HTTPClient.h>
3 #include <ArduinoJson.h>
4 #define led D4
5
6 const char* ssid      = "vivo 1606";
7 const char* password  = "12345678";
8 const char* State;
9
10 //const char* host      = "http://jsonplaceholder.typicode.com/users/1"; // Your domain
11 const char* host      = "http://vedanshu.000webhostapp.com/nodeMCU.json";
12 String payload ;
13
14 void setup()
15 {
16     pinMode(led, OUTPUT);
17     pinMode(D6, OUTPUT);
18     Serial.begin(115200);
19     delay(3000);
20     Serial.println("ESP As a Station Point Mode");
21     WiFi.mode(WIFI_STA);
22     WiFi.disconnect();
23     delay(100);
24     Serial.print("Connecting to ");
25     Serial.println(ssid);
26     WiFi.begin(ssid, password);
27     while (WiFi.status() != WL_CONNECTED) {
28
29         delay(500);
30         Serial.print(".");
31     }
32     Serial.println("");
33     Serial.println("WiFi connected");
34     Serial.println("IP address: ");
35     Serial.println(WiFi.localIP());
36 }
37 void loop() {
38     delay(500); // wait for server to respond
39
40
41 // read response
42 HTTPClient http; //Declare an object of class HTTPClient
43
44 http.begin(host); //Specify request destination
45 int httpCode = http.GET(); //Send the request
46
47 if (httpCode > 0) {
48     const size_t bufferSize = JSON_OBJECT_SIZE(1);
49     DynamicJsonBuffer jsonBuffer(bufferSize);
50     JsonObject root = jsonBuffer.parseObject(http.getString());
51     State=root["State"];
52     Serial.println(State);
53     if(strcmp(State,"on")==0)
54     {
55         digitalWrite(D4,LOW);
56         digitalWrite(D6,HIGH);
57         Serial.println("led is on");
58     }
59     else
60     {
61         digitalWrite(D4,HIGH);
62         digitalWrite(D6,LOW);
63         Serial.println("led is off");
64     }
65 }
66
67 }

```

4.4 SNAPSHOTS OF PROJECT

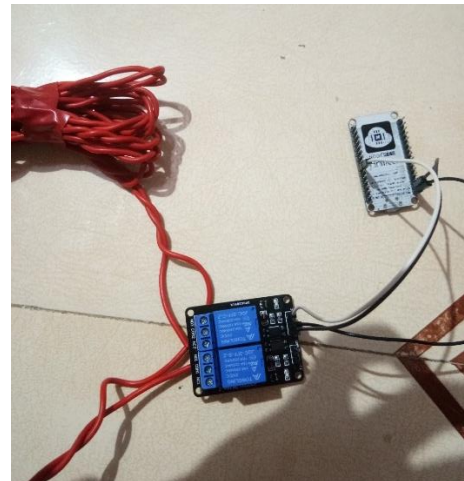
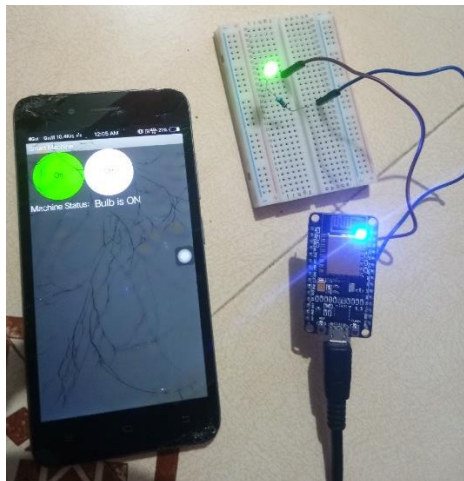
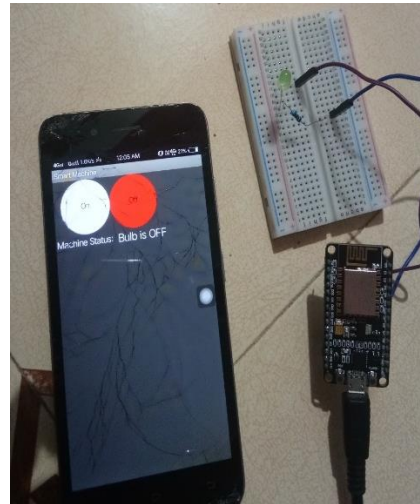
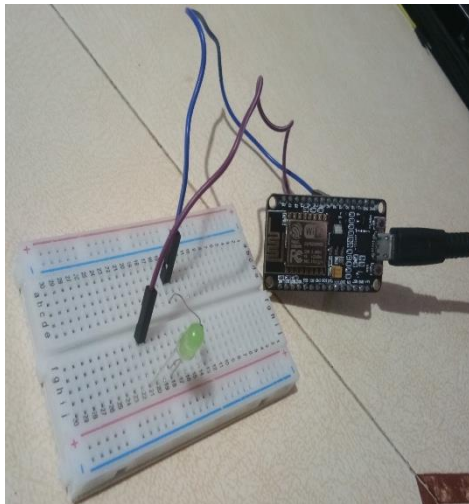


Figure 4.3 – Snapshots Of Project

CHAPTER 5

Constraints and Future Enhancement

1. AUTOMATIC LIGHT ON AND OFF FOR A ROOM {USING SENSOR}

We are trying to add a new flavour in our project that is we try to implement an sensor which is nothing but a PIR sensor. The PIR sensor detect the objects in a room and according to that it will send data to the nod MCU .if there Is no one in the room means there is no person are there in room than it will automatically switched off the lights and fans to save electricity.

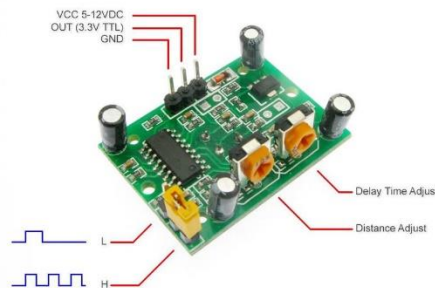


Figure 5.1 – PIR Sensor

2. CHANGE THE COLOR OF ROOM LIGHTS WITH SMART DEVICES

In this project we will try to insert a new function with light changing capacity with an mobile application. In this method we can use the RGB light and we can control them as a user wants .so that user can set the light as per requiremnts.



Figure 5.2 – RGB LED

3. CHANGE FAN SPEED WITH SMART DEVICES

We can also implement an another method which can be helpful to control the speed of fan. We can connect regulator with nod MCU and with the help of that we can adjust the speed of fan as per requirement

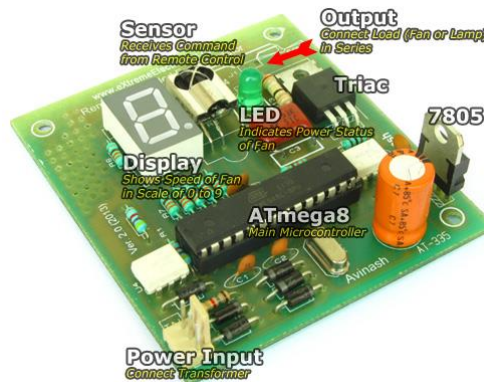


Figure 5.3 – Fan Regulator

4. AUTOMATIC ON / OFF LIGHTS

With the help of light sensor, we can turn on or turn off the electric light. At the time of evening if there is no sunlight the sensor send the command to nod MCU to turn on the light and same as in morning as the sensor detect the sun light the light will automatically off

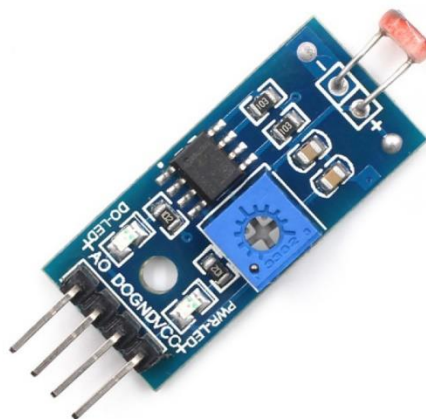


Figure 5.4- Light Sensor

CHAPTER 6

CONCLUSION

Home Automation is undeniably a resource which can make a home environment automated. People can control their electrical devices via these Home Automation devices and set up the controlling actions in the Smart Devices. We think this product have high potential for marketing in the future. At the moment the components are a bit to high to be able to produce these devices for a interesting price.

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