HOME AUTOMATION SYSTEM

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering.

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APPROVAL

This Project/internship titled **"Home Automation"**, submitted by Khalid Saifullah, ID No: 183-15-11892 & Rukaiya Sarkar, ID NO: 183-15-11952 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on *date*.
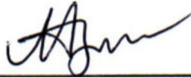
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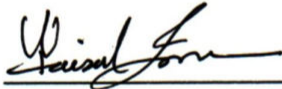**Internal Examiner**

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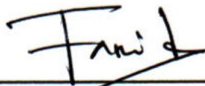Faculty of Science & Information Technology
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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Most. Hasna Hena, Assistant professor, Department of CSE** Daffodil International University.We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.
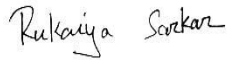
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ABSTRACT

The principal objective of this project is the help of android system with smart computerization. For this the house is getting more intelligence of the touch. Now a days people don't to work all time for this this is the best innovation of our project. On the other hand we want to create some innovation like sick or old people faced have much problem to switch on or off. This Remote controlled home robotization framework is furnishes with some advanced technology by the help of modern elements. The Node MCU module is also communicated to the other elements like relay, dc motor, ac bulb, ir sensor ect. There is also a Blynk application on the phone which is also an android device. Form the apps of Blynk we can control on or off very easily from the net connections. The use of Node MCU to reduce the cost offect of our project as this is a commercial project. If we can use it as a broad apartment or a building then we can get more benefit from ore concept. Besides to enhance this concepts we can apply it as more conceptual dymentions which can give us more easy and much effective on our daily life. Thus we can lead an easy and effective activities.

CHAPTER-1

INTRODUCTION

1.1 Introduction

These days, We can use the TV light fan or any kinds of electrical elements. If we can use the smart automation of our home or if we can apply smart controlling system then we can lead a easy life. Be that as it may we can build this project then we can apply it very effectively. On the other hand we can reduce the CO_2 emision from this inovation. We have just connect the Nord MCU and the power supply is of this. This venture assists any client can control their home's lights, fans, doors, windows etc. by the help of our ennovations. For this everyone can save their time very easily. If we can add new advancements are being acquainted with the same time of our stock. To save individuals' time we are presenting Home Automation framework utilizing any Wi-fi or any local server. With the assistance of this framework we can handle or control our home very easily on the other hand we can understand what's going on inside our home or building by only a smart phone. You can turn on/off your home apparatuses by the help of our Wi-fi.

1.2 Motivation

The fundamental rationale of this framework is to control the home objects and electronic gadgets with the assistance of an administrative framework. The administrative framework is planned so that everybody can get to it.

1.3 Objective

The principal objective of home automation and security is to assist impeded and matured individuals that will with empowering them to control home machines and alarm them in basic circumstances. It can gives us a smart area.

1.4 Expected Outcomes

The normal outcome was that by utilizing Home Automation framework extremely supportive to everybody. Everybody has some control over by their smart phone by the help

of Blynk apps. This is the new advances are being acquainted with save our time. To save individuals' time we are presenting. The Home Automation framework utilizing Wi-fi. With the assistance of this framework everybody has some control over your home apparatuses from your cell phone. So for these huge reason we can utilize if to easy our life.

Project Management and Finance

Sl. No.	Components name	Unit	Data Collect (Date)	Price (Taka)
1.	NodeMCU Esp8266	1	05-10-2021	1480
2.	12v 5A SMPS	1	19-11-2021	750
3.	Relay Module 4 Channel	1	09-01-2022	670
4.	Buck Converter	2	25-02-2022	400
5.	AC Bulb	2	27-02-2022	80
6.	DC Motor (Fan)	1	17-03-2022	80
7.	Bulb Holder	2	20-03-2022	70
8.	Ac Wire	10 Gauge	22-03-2022	130
9.	Jumper Wire	5 Set	22-03-2022	250
10.	PVC Board	½	09-04-2022	600
11.	Bread Board	Mini	15-04-2022	30
12.	Servo Motor	1	29-04-2022	150
13.	Glue Gun	1	01-05-2022	250
14.	Glue Stick	10	01-05-2022	180
15.	2 pin plug	1	01-05-2022	20
			Total=	5150

1.5 Report Layout

This report is varied in total of Six different chapter. Which are capable of extending the understanding of "Home Automation system" more briefly.

Chapter 1: Introduction

The inspiration is clarified and the proposition objective and introduction are presented.

Chapter 2: Background Studies

The applicable work is talked about and significant popular techniques are introduced corresponding related work.

Chapter 3: Requirement Specification

This Software Requirements Specification gives a depiction of the relative multitude of capabilities, determinations, outer ways of behaving, plan limitations, prerequisites (capability and non-useful) and different elements important to give a total and extensive portrayal of the proposed.

Chapter 4: Implement and testing

The project plan, the working progress update.

Chapter 6: Impact on Society, Environment and Sustainability

How peoples are getting good vibe from this project and impacting on society that discussed.

Chapter 7: Conclusion and Future Scope

The end is drawn and my commitments are portrayed.

CHAPTER-2

BACKGROUND

2.1 Preliminaries

Home Automation framework is a critical examination consideration as of late. It helps us in carrying on with an agreeable existence and nature of way of life is steadily elevated. The various procedures utilized in this framework have been talked about. In current days, a cell phone having an android application is utilized to direct and control the machines present in the home mechanization framework. In this paper various kinds of specialized systems like GSM, IoT, Wi-Fi, and bluetooth are surveyed. The advantages and disadvantages of these strategies alongside their elements have been introduced. In light of this paper the client can pick the best appropriate approach contingent on their own requirements and details for carrying out a proficient Automation framework.

2.2 Related Works

Arising advancements these days are assuming a fundamental part in making human existence computerized. In this bustling world people are caught up with web and mechanized gadgets. As an outcome computerized homes or brilliant homes have turn into a popular expression and their execution is expanding quickly. Brilliant homes doesn't just mean correspondence with equipment gadgets utilizing web, it ought to likewise incorporate gotten connecting. We did a decent examination on the papers on Home Automation and different plans carried out before. A portion of the current plans are informed here.

Kumar Mandula in his paper carried out home robotization in two ways utilizing Bluetooth and utilizing Ethernet. Arduino is utilized for programming and controlling different gadgets. Bluetooth is for short reach correspondence. Thus, in savvy home executed utilizing Bluetooth, one can work the gadgets from home just inside the area of 10-20m.This limit has been beaten in the following plan utilizing Ethernet. This paper talked about just the control of various electronic gadgets in home utilizing portable application however it remembered no security features. Mitul Sheth for his task examined different potential gadgets that can be associated with Internet utilizing Android App and various methods of utilizingthem; manual and computerized mode.

2.3 Scope of the problem

Security Issues: As with all figuring gadgets, security will turn into a more prominent issue as additional individuals utilize brilliant home gadgets.

2.4 Challenges

Crafted by John J. Greichen [12] examined a portion of the early difficulties looked by home computerization frameworks. These incorporate high assembling costs, high improvement costs, high establishment costs, extra help and backing costs, absence of home mechanization principles, purchaser newness to is an enormous drawback, which isn't true in their proposed strategy. Additionally, in Web server based home mechanization, the plan of web server and the memory space required is catapulted by this strategy, since it just purposes the all around existing web server administration given by G-mail. LEDs were utilized to show the exchanging activity. Framework is intuitive, proficient and adaptable. Shih-Pang Tseng et al. proposed Smart House Monitor and Manager (SHMM), in view of the ZigBee, all sensors and actuators are associated by a ZigBee remote organization. They planned a straightforward savvy attachment, which can controller through ZigBee. PC have is utilized as an information gatherer and the movement detecting, all detecting information are moved to the VM in the cloud. The client can utilize the PC or Android telephone to screen or control through the Internet to drive saving of the house. Arduino microcontroller to get client orders to execute through an Ethernet safeguard. Our home organization utilized together both remote ZigBee and wired X10 advancements. This framework followed brilliant undertaking planning with a heuristic for the Asset obliged booking issue (RCPSP). The cell phone can be either wired to the focal regulator through USB link or speaks with it remotely, inside the extent of the home. Arduino contains the web server application that conveys through the HTTP convention with Web-based Android application. The framework is profoundly adaptable and versatile and expandable. The home organization which screens the machines and sensors and sends information to the cloud-based information server which deals with the data and offers types of assistance for clients by communicating information and getting client orders from portable application .

CHAPTER-3

REQUIREMENT SPECIFICATION

3.1 Business process Modeling

Here the project if we will do the business by this project be a product at first we need to design the project. After that we need to analysis the pricing which is better for the customers.

3.2 Requirement Collection and Analysis

- **Hardware Requirements:**

    Node MCU Esp8266

    Power Supply

  IR Sensor

    Relay Module 4

    channel Converter

  Jumper wire

    Buck Converter

    Servo Motor

    AC bulb

    DC Motor (Fan)

    Bread Board

- **Software Requirements**

    Arduino Uno IDE

    Blynk android application

CHAPTER-4

DESIGN SPECIFICATION
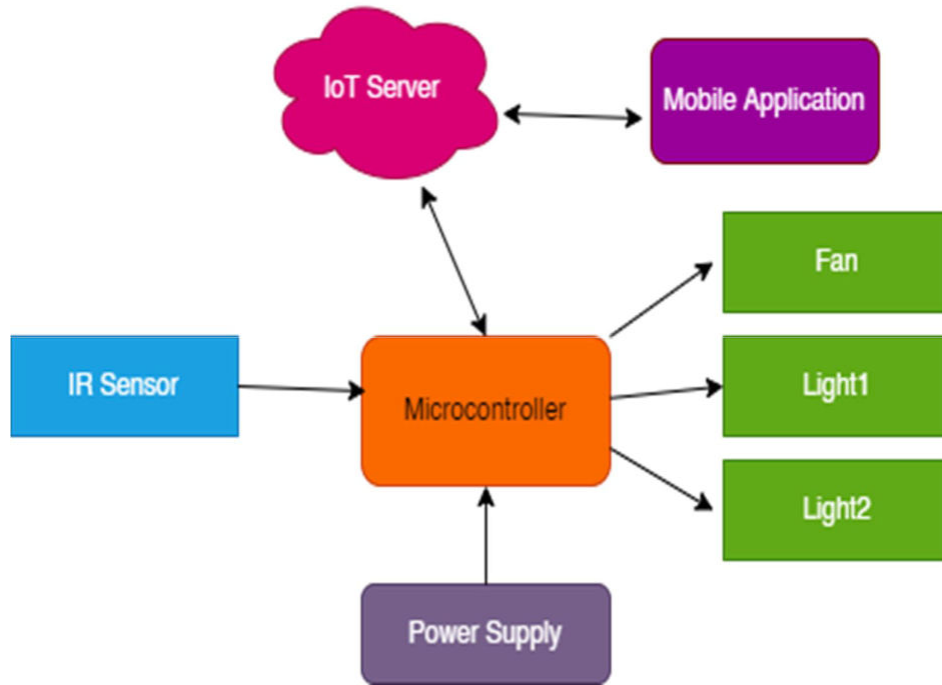
4.1 Block Diagram

Figure: 1

Here, is the microcontroller which can coltrolled the basic three components fan, light1 and light2.Besides the microcontroller gets inputs singnal from IR Sensor and Power Supply and also IoT Server.One the other hand, the IoT Server returns the signal by the combination of Mobile Application.

4.2 Flow chart
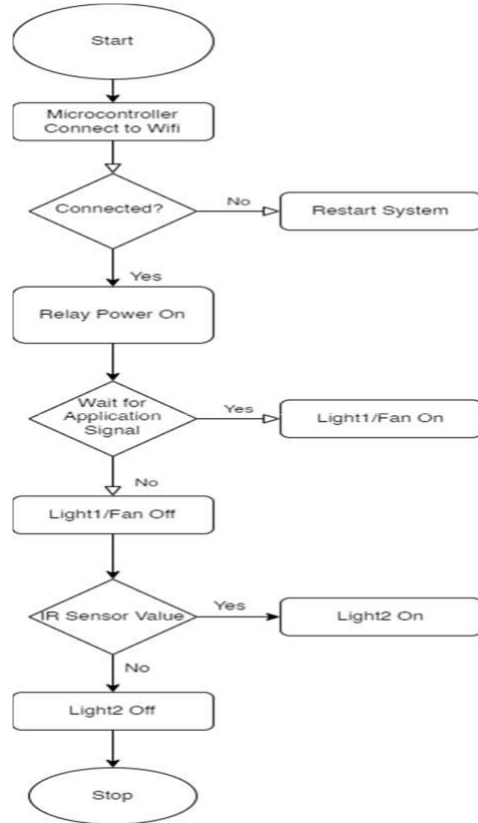
Figure: 2

Firstly, we have started the device. Then we can connect the microcontroller to the wifi. If the wifi is connected then we can on the Relay Power On. Or if the wifi is not connected then we need to restart the system. When the Relay power is on then wait for the application signal. the we can on the light1 or fan. Then when the IR Sensor gets the value then the light2 is already turned on. For this time we can also of the light2.At last we stopped the function. Thus, we can complete this task properly.

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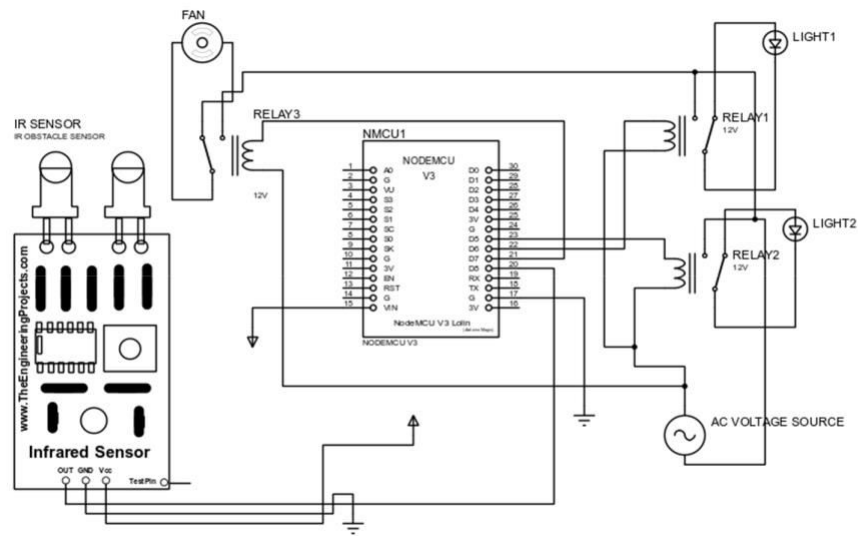
4.3 Circuit Diagram

Figure: 3

4.4 Circuit Diagram Description

Here is our circuit diagram. Here all components are connected with Node MCU .At first we connected the Node MCU to the power supply. After that we connected relay module than our objects are connected with that. After that we connected Blynk app.

4.5 Implementation Requirements

Most of the home automation solution nowadays is basically an android phone based, where a single smartphone controls all home appliances. A home automation prototype can be easily implemented using Node MCU. The benefits of home automation typically fall into a few categories, including savings, safety, convenience, and control. Additionally, some consumers purchase home automation for comfort and peace of mind.

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CHAPTER-5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

Its time of innovation world is turning out to be quicker and more straightforward because of this reason our homes likewise ought to turn out to be important for it. Setting in any piece of world we can work our home just by our PDA. Isn't it an extraordinary thought, yes with the assistance of hub MCU and Blynk application it's conceivable. Here we utilize the idea called IOT. Utilizing the idea of web of things we plan our venture to make human existence solid. With the assistance of IOT things can be excessively simple. Fundamental point of this venture is to atomize ruler homes in less expense. For Implementation need a few parts.

5.2 Node MCU
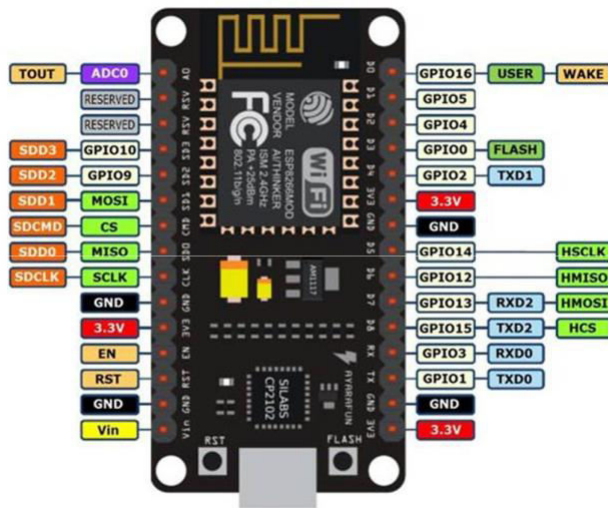
Figure: 4

IoT stage hub MCU is open source. Language utilized in it is lua prearranging language. It depends on the project, and based on the ESP8266 SDK 0.9.5. It utilizes many open source projects, for example, lua-cjson, and spiffs. It incorporates firmware which runs on the ESP8266 Wi-Fi SoC, and equipment which depends on the ESP-12 module. Node MCU was made not long after the ESP8266 emerged. In December 30, 2013, Espressif frameworks started creation of the ESP8266.The ESP8266 is a Wi-Fi SoC coordinated with a Tensilica Xtensa LX106 center, widelyused in IoT applications. NodeMCU s tarted in 13 Oct 2014,

when Hong committed the primary document of NodeMCU - firmware to GitHub. After two months, the task extended to incorporate an open-equipment stage when designer Huang R committed the gerber document of an ESP8266 board, named devkit 1.0. Soon thereafter, Tuan PM ported MQTT client library from Contiki to theESP8266 SoC stage, and focused on Node MCU project, then, at that point, Node MCU had the option to help the MQTT IoT convention, utilizing Lua to get to the MQTT IoT convention, utilizing Lua to get to the MQTT representative.

5.3 Blynk App

Figure: 5

Blynk is a Platform with iOS and Android applications to control Arduino, Raspberry Pi and the preferences over the Internet. It's a computerized dashboard where you can fabricate a realistic connection point for your undertaking by just relocating gadgets. It's really easy to set everything up and you'll begin dabbling in under 5 mints. Blynk isn't attached to some particular board or safeguard. All things considered, it's supporting equipment of your decision. Whether your Arduino or Raspberry Pi is connected to the Internet over Wi-Fi, Ethernet or this new ESP8266 chip.

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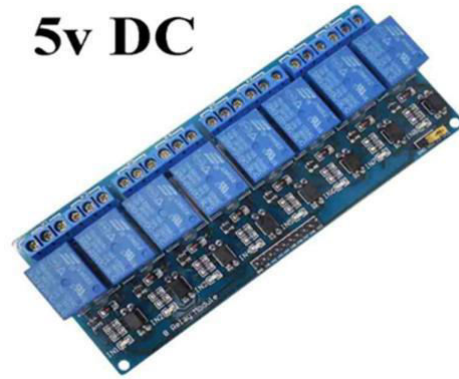
5.4 Relay Module

Figure: 6

The Relay Shield is an Arduino viable brilliant module with 4 mechanical transfers giving a simple method for controlling high voltage. The maximum exchanging power is 35VDC 70W for each channel.

5.5 IR Sensor
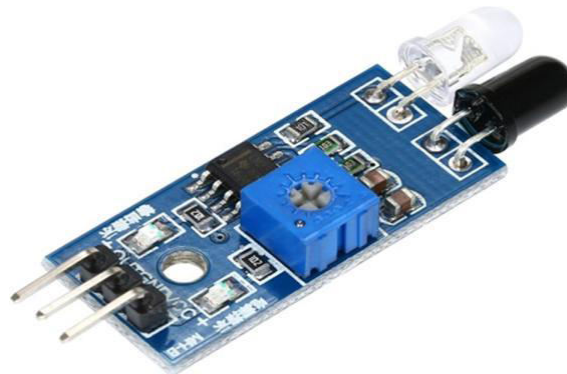
Figure: 7

The various sensors are been utilized in this venture, for example, IR sensor which is been utilized for movement recognition. Gas spillage sensor is utilized to check whether the gas in home on which we cook food is released or not this sensor assumes virtual part as its utilized for security reason. Fire recognition sensor as its utilization is to dected fire in cover. Temperature sensors which distinguish temperature of safe house. The primary moto is wellbeing so all sensors plays their obligation towards security.

5.6 Servo Motor

Figure: 8

A sort of servomotor that utilizes DC electrical information furthermore make mechanical yield like speed, speed addition of position are known as DC servomotor. It is as well, some degree comparable to, a typical DC engine. In any case, there exist a few contrasts between a common dc engine and dc servomotor. In this sort of DC servomotor, the controlling are given also, the field winding. Significantly more explicitly, we can say, the controlled sign oversaw by the speaker are also, the field winding. Along these lines, it is named so. While the armature current is remained mindful of at a dependable worth utilizing a reliable current source. It is too, be noted here that the field in this sort of dc servomotor can be either electromagnetic sort where a hitting post is open with a field bending injury around it and excitation too, it is given DC or a solid magnet type. Fundamentally, agreeing also, the overall force province of DC engine, the force are straightforwardly contrasting too, the result of field progress and the armature current On the off chance that the worth of the current source applied at the armature is amazingly colossal, then, at that point, for a little change in field current, there will be a contrasting change in the force of the engine.

5.7 Power Supply (SMPS)

Figure: 9

An exchanged mode power supply, some of the time known as a switch-mode power supply or 'SMPS', is an electronic power supply that coordinates an exchanging controller for proficient electrical power transformation. Like different supplies, a SMPS moves power from a DC or AC source to DC loads while changing over voltage and current.

5.8 Jumper Wire

Figure: 10

A jumper wire is an electric wire that interfaces far off electric circuits utilized for printed circuit sheets. By connecting a jumper wire on the circuit, it tends to be short circuited and easy route (leap) to the electric circuit.

5.9 Testing Implementation

Here we will show to how we did this project. How we did the connections to the full project.

Experimental Setup

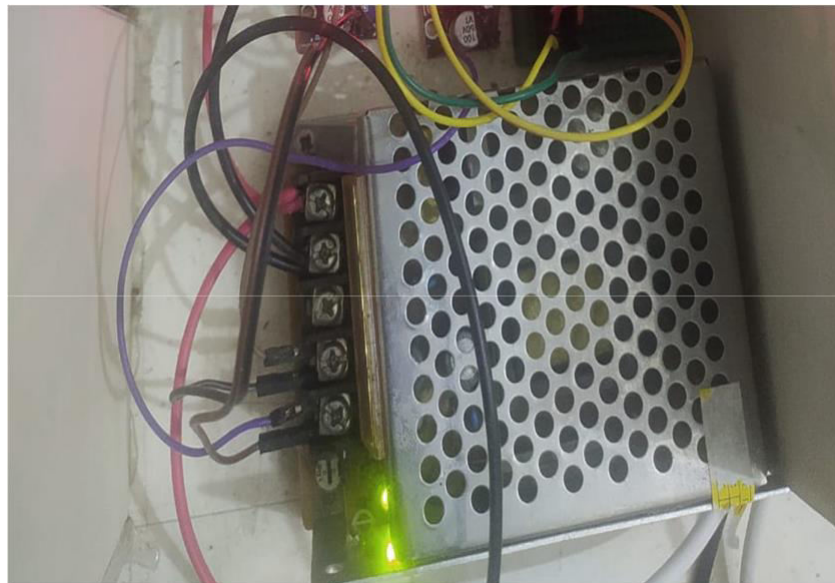**In this project, we experiment with all the projects parts.**

Figure: 11

Power Unit (SMPS) test

➢ We are using 12v DC power supply. When the power supply get plugged the green light will on.

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Connecting the Relay Module

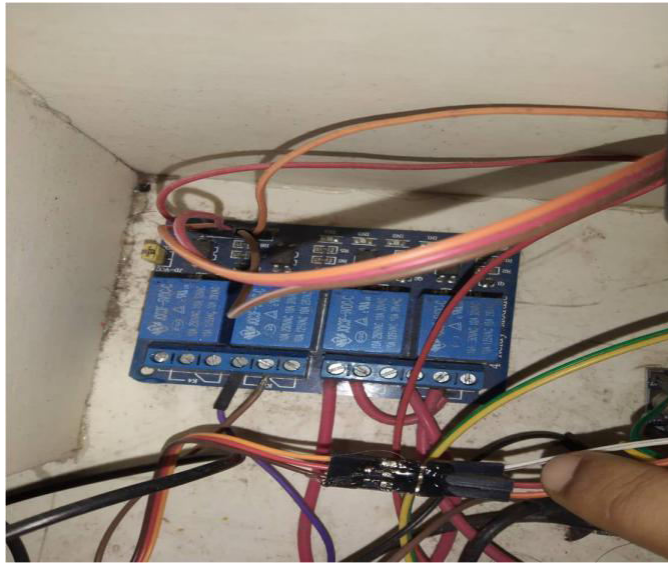**Figure: 12**

Here is the Relay Module which is connecting with the Power Supply by the Jumper Wires.

5.10 Testing results and reports
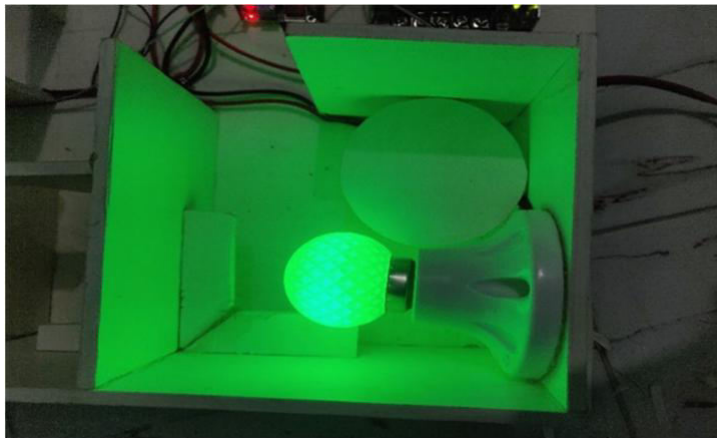
Figure: 13

After set up all the components then we will use the Blynk app.There we use button to controling the lights,fan, servo motor.After trying to control by the Blynk they are working properly.

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Figure: 14

On the other hand when we set up all the components then we can also open the another light which means light2.There we use button to controling the lights,fan,servo motor.After trying to control by the Blynk they are working properly.
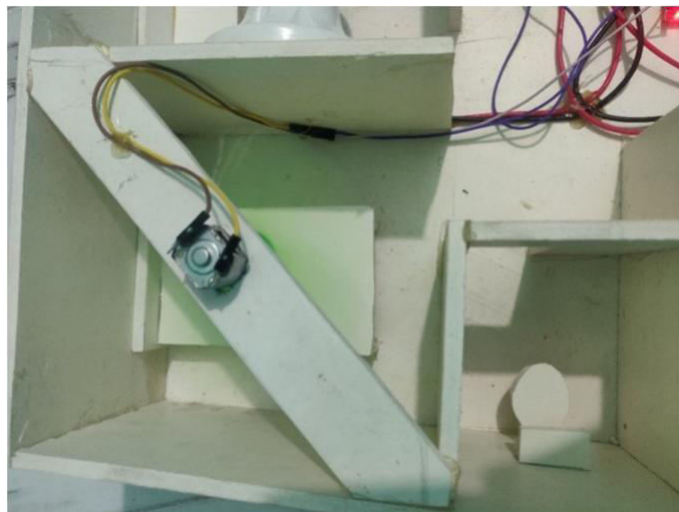
Figure: 15

When we add the button of fan on the platform of blynk app. Then we click the button of the fan we can.

Figure:16

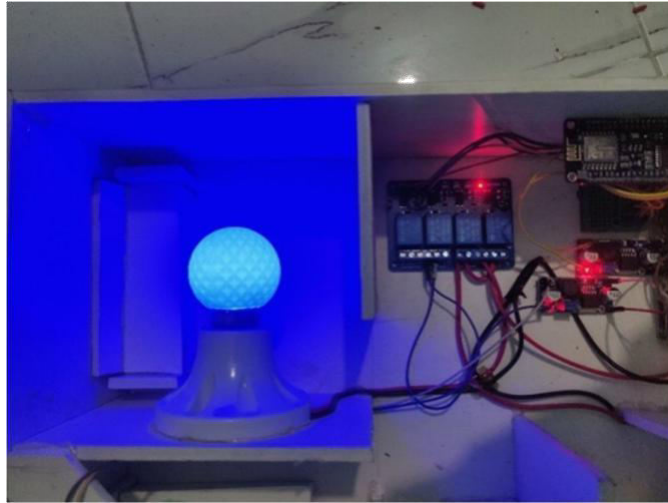Here by the help of Blynk app we can run all our components.There we use button to controling the lights,fan, servo motor.After trying to control by the Blynk they are working properly.At last we can run the fan's button on.For this it can works properly.

Figure:17

Yeah, this is the final active picture of our project.For the best use of some components we can active these activations.Sech as the light1, light2 and the another is the fan.Here is the power supply and the relay can work properly then we can get the commandable singnal.

CHAPTER-6

IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

6.1 Impact on society

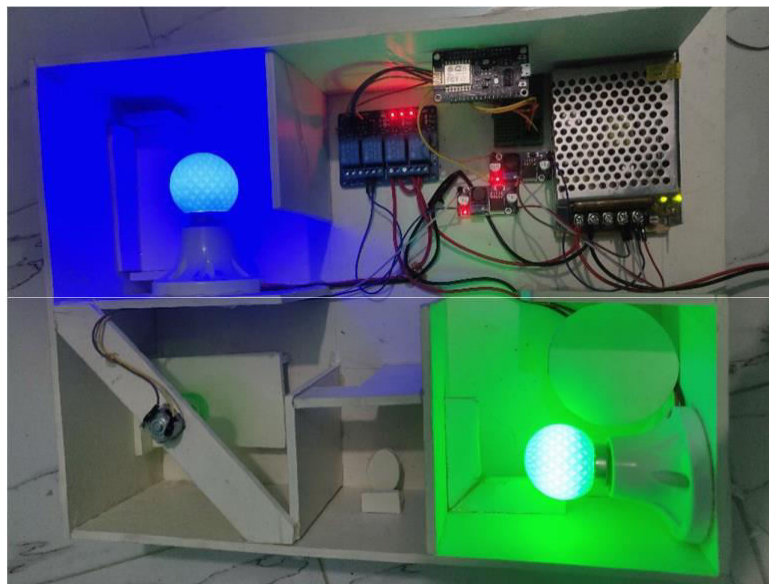**Safety:** Many home automation progresses fall under the products of home security Consumers purchase these articles since they need to make their homes increasingly safe. Automated lighting upsets would-be hoodlums, and development sensor help people with entering entrances.

Convenience: Because home automation innovation performs repetition errands naturally, end clients experience extraordinary accommodation. Bunches of shrewd contraptions are viable with each other, and you can set various triggers between gadgets to mechanize standard home cycles. For example, you could set your savvy lock to turn on your brilliant lighting when you open the front entryway.

Control: Customers additionally pick brilliant home gadgets to more readily control capabilities inside the home. With home computerization innovation, you can understand what's going on inside your home consistently.

6.2 Impacts on Environment

Computerization Reduces Carbon Emissions.

Uncompromising manual worked apparatus radiates more CO2 to the climate contrasted with the electronic ones. Computerized machines can assist with decreasing fossil fuel byproducts considerably and subsequently permitting air to clear up.

CHAPTER-7

DISCUSS AND CONCLUSION

7.1 Discussion and conclusion

The framework as the name designates, 'Home automation makes the framework more adaptable and gives appealing UI contrasted with other home mechanization frameworks. In this framework we coordinate cell phones into home computerization frameworks. A clever engineering for a home mechanization framework is proposed utilizing the generally new correspondence innovations. The framework comprises of chiefly three parts is a Node MCU module and transfer circuits. WIFI is utilized as the correspondence channel between android telephone and the Node MCU. We conceal the intricacy of the ideas engaged with the home automation framework by including them into a basic, yet extensive arrangement of related ideas. This rearrangements is expected to fit as a significant part of the usefulness on the restricted space presented by a cell phone's showcase. This paper proposes a minimal expense, secure, universally open, auto-mated, somewhat controlled arrangement. The methodology examined in the paper is novel and has accomplished the objective to control home apparatuses remotely utilizing the WiFi innovation to associates framework parts, fulfilling client needs and necessities. WiFi innovation skilled arrangement has ended up being controlled from a distance, give home security and is savvy when contrasted with the beforehand existing frameworks. Subsequently we can infer that the necessary objectives and targets of home mechanization framework have been accomplished. The framework plan and design were examined, and model presents the fundamental degree of home apparatus control and remote checking has been executed. At last, the proposed framework is better from the adaptability and adaptability perspective than the monetarily accessible home automation framework.

7.2 Scope for Further Developments

- ➢ To make it accessible in exceptionally less expense for ruler region people groups and schools.
- ➢ Decreasing greater intricacy of things and effectively accessible to individuals.
- ➢ Expanding security of the framework.

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