



Design Thinking Implementation on Affordable Home Automation System Using IoT

Dr.B. Sivasankari, Vishwamoorthy R, Nandhini K.E.S, Surya Kannan K

Professor, Student, Student, Student
Electronics And Communication Engineering,
SNS College Of Technology, Coimbatore, India.

Abstract : Home automation allows your home to make decisions based on environmental circumstances and be controlled remotely. Home automation is crucial. This saves power. The world needed to minimise carbon emissions and electricity use. Small home automation saves electricity that can be utilised to generate items. In this Home Automation System, we'll control a TV, Fan, Bulb, Motor, and Refrigerator with Blynk. Wifi Module NodeMCU ESP8266 receives smartphone commands wirelessly over the internet.

IndexTerms - Home Automation, minimize electricity use, IoT.

I. INTRODUCTION

Home automation seems like a 1970s-era fantasy of a futuristic home: a home that prepares your coffee and plays calming music to lull you to sleep. That futuristic home is now a reality, and it's far cooler than we could have imagined. Home automation appeals to folks who enjoy cutting-edge technology and who want more organisation in their hectic homes.

This project shows how to build an IoT-based home automation system with Blynk and the NodeMCU ESP8266. A popular online activity is Smart Home Automation Project. Home Automation refers to the automation of lighting, climate, entertainment, and appliance systems. Access control and alarm systems may be included. Home devices that are connected to the Internet are considered IoT.

Blynk will be used to control a TV, fan, bulb, motor, and refrigerator in this Home Automation System. Wifi Module NodeMCU ESP8266 wirelessly receives smartphone commands over the internet. The best IoT Platform encrypts and sends the ON/OFF signal to the server and ESP8266 hardware. We choose Blynk since it is the greatest app. This project cannot function without the Internet.

We will learn how to create a Home Automation project utilising NodeMCU and the Blynk App in this IoT-based project. To manage household appliances safely from a smartphone via the internet, all we need is a NodeMCU board and a relay module. For this smart home project, I've provided all the information you need, including the esp8266 NodeMCU pinout, circuit, Arduino sketch, and Blynk App setup.



Figure 1: IoT Representation

II. DESIGN THINKING APPROACH

We approached this paper in a Design Thinking concept. Design thinking refers to the set of cognitive, strategic, and practical procedures used by designers during the design process, as well as the body of knowledge developed about how people reason when confronted with design problems.

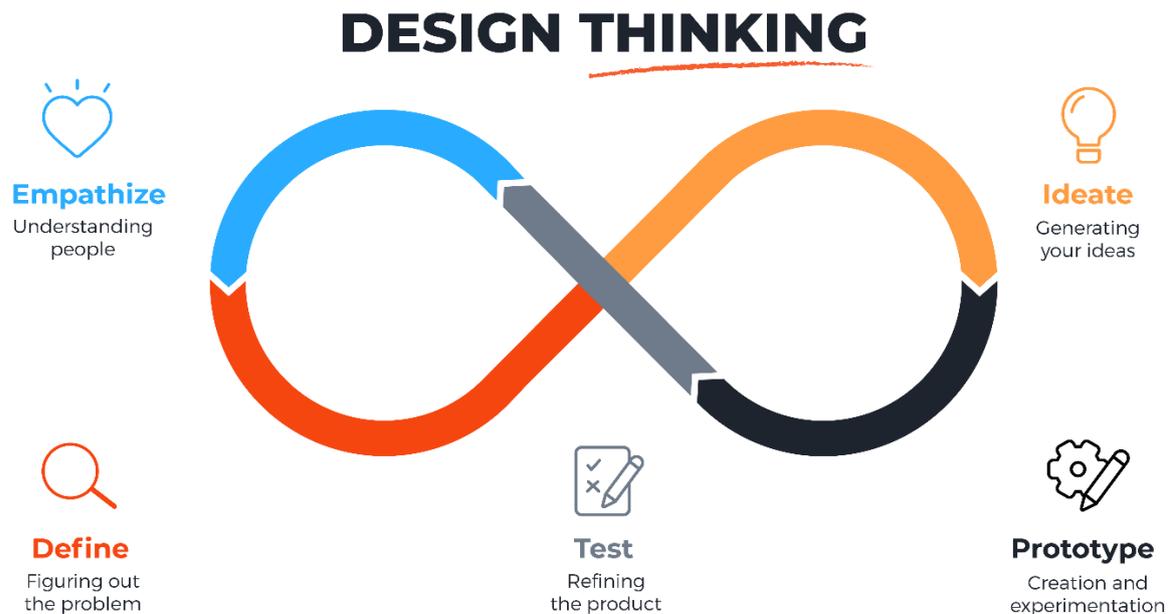


Figure 2: Design Thinking Concept

III. THE IDEATE:

The project's main goal is to create affordable home automation. To manage the linked devices, we employ open source and cost-free software like Blynk. Additionally, this automation will provide insights into our usage and aid in bettering our everyday consumption. This smart home is an Internet of Things (IoT) project that uses a Wireless Fidelity WiFi connection to control loads using an internet connection. A smartphone with an internet connection that uses the Blynk app as a control panel and a NodeMCU microcontroller kit as a controller that receives control orders from a WIFI signal on the other side.

IV. PROTOTYPE:

The home automation circuit consists of an ESP8266, a 4-channel relay board, and the Blynk Android app. The circuit schematic should be followed closely when setting up the devices. The ESP8266 will manage relays that power AC mains appliances (light bulbs).

Once the Arduino IDE has been installed, you can connect the board to your computer through USB. Launch the Arduino IDE and navigate to Tools > Boards > NodeMCU 1.0 (ESP-12E Module). Then, in the Port drop-down menu, pick the appropriate port. Load the example code by going to Files > Examples > Basics > Flash to get the NodeMCU board up and running and to cause its built-in LED to blink. When the sample code has been successfully imported into your IDE, you may proceed to the next step by selecting the "upload" button located in the IDE's toolbar.

The board's built-in LED should begin blinking after the upload is complete. The user must follow the aforementioned steps to install and set up the Blynk app. Relay Board Connecting NodeMCU to Four Outputs Join the NodeMCU's D0 pin to the 4-Channel Relay board's D1 pin. Connect the NodeMCU's D1 pin to the 4-Channel Relay board's D2 pin, the NodeMCU's D2 pin to the board's D3 pin, and the NodeMCU's D3 pin to the board's D4 pin. The NodeMCU's 3.3V supply must be connected to the Vcc pin on the 4-Channel Relay board, and the NodeMCU's ground must be connected to the GNDpin on the same board.

To establish a connection to the network, we have incorporated the ESP8266 WiFi library, which contains WiFi routines tailored to the ESP8266. The BlynkSimpleEsp8266 package provides the framework for Interaction between the Blynk app and the ESP8266 module.

V. CIRCUIT:

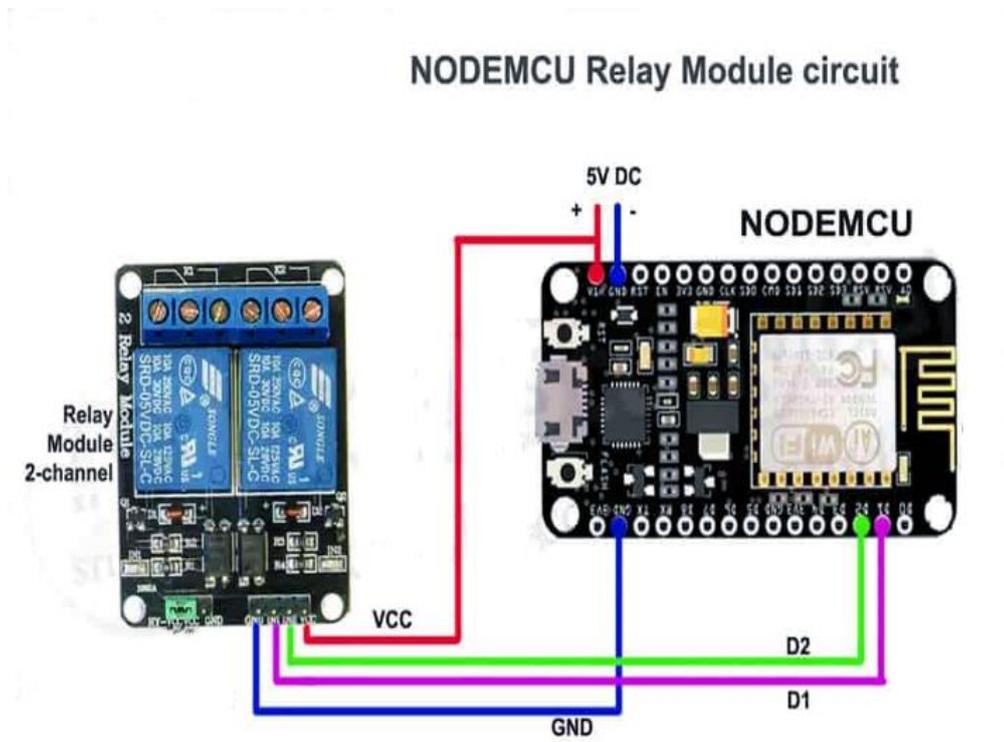


Figure 3: Circuit

VI. TESTING AND OUTPUT IMAGE:

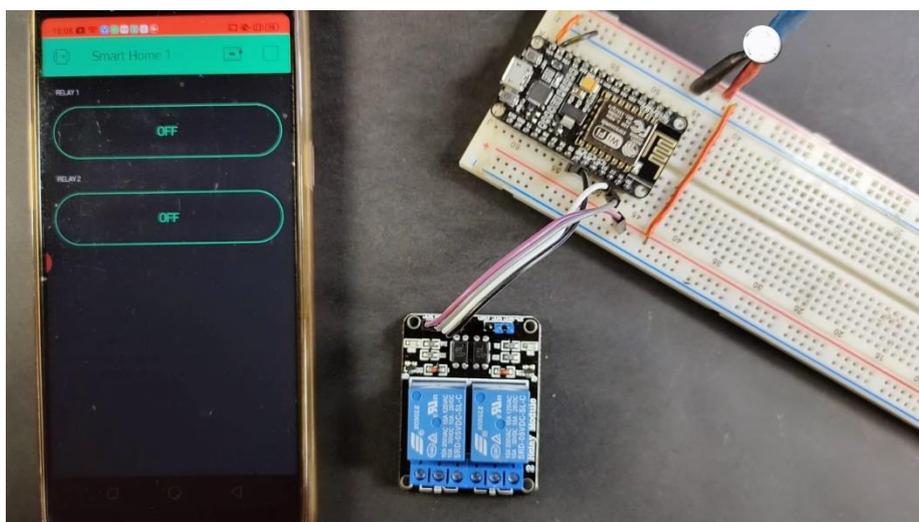


Figure 4: Output Image of working application

VII. CONCLUSION:

Implementation has resulted in a high percentage of correctness in our projected model. This technique has the power to control home appliances that support the user's preferred mode. All of the modes have been found to operate with reasonable accuracy during implementation. Users only need to select a mode on their cell phones; the rest of the appliance control will be handled by our system. This project is really trustworthy as it is planned. As a result, it is said that this system has good potency and higher precision. The potential for this system to improve in the future is enormous. This is frequently the first generation of home automation, as was already mentioned. With the help of data analysis and storage on cloud servers, it might be upgraded to the second generation. Then,

using machine learning algorithms, we even have a propensity to avoid choosing smartphone modes. Instead, it would have its own computer science and be capable of switching modes.

REFERENCES

- [1] Vinay sagar K N and Kusuma S M, "Home automation using Internet of Things," in International Research Journal of Engineering and Technology (IRJET), Volume: 02 Issue: 03 | June-2015, e-ISSN: 2395-0056, p-ISSN: 2395-0072.
- [2] Easyelectronicsproject.com - Home Automation using NodeMCU & Blynk App (IoT) – WiFi Relay Module
- [3] Renuka P. Dhage and S.P.Kharde, "A Review on home automation system (HAS)," in International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (An ISO 3297: 2007