

# Home Automation Using NODEMCU

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**Abstract**—Home automation systems have emerged with the rapid development of advanced technologies such as the Internet of Things (IoT). These systems are used to automate various home appliances such as lights, fans, air conditioners and security systems and can be controlled remotely via mobile apps. This article proposes to use NodeMCU and Android application to develop a smart home automation system. NodeMCU is a low cost open source programmable board based on the ESP8266 chip. It has an integrated Wi-Fi module that allows the device to connect to the Internet. Control your home appliances remotely using an Android app. The proposed system is cheap and secure, using standard cryptographic protocols. The system is also user-friendly and the user interface is developed according to Material Design guidelines. The system is tested for accuracy and user satisfaction. The test results are published in a research paper. The proposed system can be used to automate various household appliances, allowing them to be controlled more easily and efficiently.

**Index Terms**— Home Automation using Node-MCU, Home Automation App, Cell Phone, Micro Controller.

## I. INTRODUCTION

Introduction : In a fast-paced world, time is the most important factor. You can turn industry equipment on/off by putting order through your laptop using the internet. It will be Save time and labor required for control household or industrial equipment. Use the key command on IOT, we can control five devices. We can increase the number of devices. The most important factor about this project is that it is controlled by android app. The person who logged in into the App on its Device can only interfering control devices. In addition, it eliminates the need for Bring the remote control to turn on/off the device. This project has the integration of IoT and Embedded System. User must be logged in to the above app its devices to control the devices.

## II. LITERATURE SURVEY

Home automation using the Node MCU microcontroller is a rapidly growing field with a significant amount of research being conducted. The Node MCU microcontroller is an open-source Wi-Fi-enabled microcontroller that can be programmed with the Arduino IDE. The following is a literature survey of home automation using the Node MCU microcontroller:

"IoT-Based Smart Home Automation System Using Node MCU " by N. Gupta et al. (2021) - This paper presents an IoT-based smart home automation system that uses Node MCU for home automation. The authors present a detailed description of the Node MCU microcontroller and explain how it can be used for home automation. The paper also includes the system architecture, implementation details, and experimental results.

"Design and Implementation of Smart Home Automation System Using ESP8266 and Blynk" by H. A. Mohamad et al. (2019) - This paper describes the design and implementation of a smart home automation system using Node MCU and the Blynk app. The authors present the system architecture, hardware components, and software components. The paper also includes a discussion on the advantages of using Node MCU for home automation.

"A Low-Cost and Robust IoT Solution for Home Automation Using Modemcu" by A. Rahman et al. (2018) - This paper presents a low-cost and robust IoT solution for home automation using Modemcu. The authors describe the hardware and software components of the system and demonstrate how it can be used to control various home appliances. The paper also includes a discussion on the scalability and extensibility of the system.

"Home Automation using Node MCU and Google Assistant" by S. Bhargava et al. (2018) - This paper describes a home automation system that uses Node MCU and Google Assistant for voice-based control. The authors present the system architecture, implementation details, and experimental results. The paper also includes a discussion on the advantages and limitations of voice-based control.

"IoT-Based Home Automation System using Node MCU and MQTT Protocol" by M. H. Rahman et al. (2019) - This paper presents an IoT-based home automation system that uses Node MCU and the MQTT protocol for communication. The authors describe the hardware and software components of the system and demonstrate how it can be used to control various home appliances. The paper also includes a discussion on the advantages of using the MQTT protocol for communication.

In summary, the literature survey reveals that home automation using Node MCU is a rapidly growing field with a significant amount of research being conducted. The Node MCU microcontroller is being used for a wide range of home automation applications, including smart home automation systems, voice-based control systems, and IoT-based home automation systems. The research demonstrates that Node MCU is a powerful and versatile microcontroller that can be used for home automation in a variety of different ways.

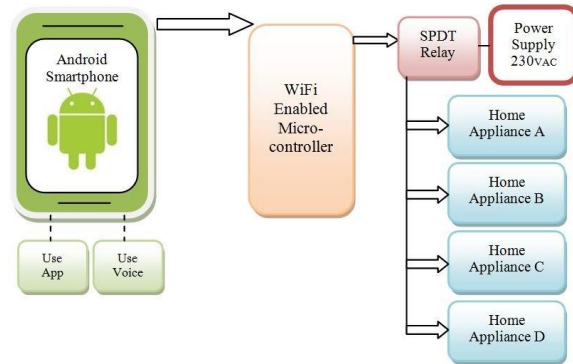
### III. SYSTEM ARCHITECTURE

IOT base home automation provides applications to turn non-smart device into smart device, which allow the users to access these devices through the Internet. It transfigures the home into smart home and provides a more vigorous method of controlling the home appliance. User can detect their home and can turn ON/OFF their appliances which will certainly going to save both the electricity and electric bills.

System design is strained by the requirements covering from simple control of lights in the house to controlling all appliances and the security system. Each requirement influences the pandemic design, and developers need to regulate the most optimized way to perform all the tasks with the lowest cost and convolution.

The most basic and crucial requirement in a home automation system, the interface is the basic

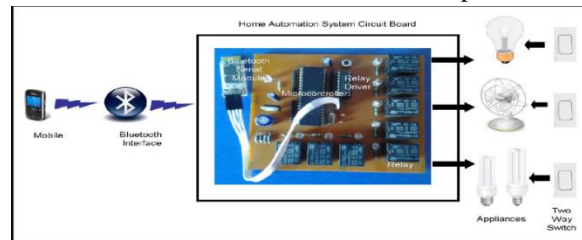
communication arrangement and hardware combination used for sending and accepting messages between devices and the user. Designers have many alternatives for implementing communication between devices, the user, and the pandemic system, depending upon the system, range, size of house, ease of use, etc. If a user wants to control the home appliances through the Internet, the designer needs to add an Ethernet/Wi-Fi interface to connect the system to the home network. If the user wants to control the system using Bluetooth from a cell phone, the designer needs to add a Bluetooth interface to communicate with the device.



### IV. HARDWARE

There are a variety of hardware options available for a home automation project depending on the specific requirements and functionalities you want to implement. Here are some of the most common hardware components used in home automation projects:

Microcontrollers - Microcontrollers are the heart of most home automation systems. They are small computing devices that can read data from sensors, control outputs, and communicate with other devices. Some popular microcontroller platforms for home automation include Arduino, ESP8266 chip.



Sensors - Sensors are used to detect various environmental variables such as temperature,

humidity, light, and motion. These sensors can provide data to the microcontroller, which can then be used to trigger events or control outputs. Some common sensors used in home automation include temperature sensors, humidity sensors, light sensors, and motion sensors.

Actuators - Actuators are devices that can be controlled by the microcontroller, and they are used to control various outputs such as lights, motors, and locks. Some common actuators used in home automation include relays, servo motors, and solenoids.

Communication modules - Communication modules are used to establish communication between different devices in the home automation system. Wi-Fi, Bluetooth, and Zigbee are some of the popular communication protocols used in home automation.

Display - A display is optional but can be helpful for monitoring and controlling the home automation system. LCD displays, OLED displays, and LED displays are commonly used in home automation.

Power supplies - The home automation system requires a stable and reliable power supply. Depending on the specific requirements of the project, a simple 5V USB power supply or a more advanced power supply with voltage regulators and battery backup may be needed.

These are some of the most common hardware components used in a home automation project, but the specific components needed will depend on the specific requirements of project.

## V. CONCLUSION

HOME AUTOMATION will control devices connected to phone from a remote location via internet. It provide you to access home automation appliances within your home without compromising security. It pays most prime to security and, therefore, does not provide direct access from a public network. Therefore, there is a faster, secure, economical way to remotely control your electronic gadgets at home in any part of the world. Home Appliances Controlling using Arduino using IOT technique is automatic versatile system. It can be implemented in

home, agricultural field, remote and hazardous applications, college and university.

It provides the mouldability and system reliability with low cost as well as less maintenance. It provides remote access to the system to deliver service at any time of the day. With this system, we can control as well as monitor the devices at remote location.

The whole system can be execution using wireless technology. The embedded device can be made as a remote controlling electronic gadgets.

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