

## HOME AUTOMATION

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### Abstract

This project presents the overall design of Home Automation System (HAS) with low cost and wireless system. It specifically focuses on the development of an IOT based home automation system that is able to control various components via internet or be automatically programmed to operate from ambient conditions. In this project, we design the development of a firmware for smart control which can successfully be automated minimizing human interaction to preserve the integrity within whole electrical devices in the home. We used Node MCU, a popular open source IOT platform, to execute the process of automation. Different components of the system will use different transmission mode that will be implemented to communicate the control of the devices by the user through Node MCU to the actual appliances.

**Keywords**—Home Automation System(HAS),Internet Of things(IOT),node MCU(micro controller unit).

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### I. INTRODUCTION

Internet of Things (IOT) is a concept where each device is assigned to an IP address and through that IP address anyone makes that device identifiable on internet. The mechanical and digital machines are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Basically, it started as the "Internet of Computers." Research studies have forecast an explosive growth in the number of "things" or devices that will be connected to the Internet. The resulting network is called the "Internet of Things" (IoT). The recent developments in technology which permit the use of wireless controlling environments like, Bluetooth and Wi-Fi that have enabled different devices to have capabilities of connecting with each other. Using a WI-FI shield to act as a Micro web server for the Arduino which eliminates the need for wired connections between the Arduino board and computer which reduces cost and enables it to work as a standalone device. The Wi-Fi shield needs connection to the internet from a wireless router or wireless hotspot and this would act as the gateway for the Arduino to communicate with the internet. With this in mind, an internet-based home automation system for remote control and observing the status of home appliances is designed. Insistence for electricity is increasing day by day and frequent cuts are causing many problems in various areas like industries, hospitals and houses. The backup arrangement for power source is a must. We are facing many real time challenges in daily activities due to short electricity supply. Even after having electrification, solar panels and backup of different sources, simultaneous functioning of their operations and handling are herculean tasks. Out of these challenges, important one is availability of electricity which is variable and unreliable. These are economically not available for heavy load since there is a need of excess backup capacity. Also due to fluctuating weather conditions makes the system more vulnerable to power outage. Objective of this project is to combine the concept of wireless power transfer concept used for the generation of power and Internet of Things (IoT) based smart Home Automation. The proposed design concept is used to monitor and control electrical consuming devices like switches, bulb, fan, tv etc in order to effectively balance energy generation and usage.

### II. BACKGROUND STUDY (LITERATURE)

Home automation is a difficult task for both the developer and the user. The developer must select the component based on the needs of the customer. Because all client requests are not equal, they must make do with the current offerings. A careful examination of the "Home automation using IoT" proposal by Shopen dey, and Sandeep das reveals that they utilized the Raspberry pi to link the ESP8266-01 to the web. This module allows them to control numerous devices via a web page and an Android application. In their article, K. Venkatesan and Dr. U. Ramachandraiah constructed a Zigbee module in an Arduino mega to control devices.

They employed numerous sensors for a variety of purposes. They have also offered real-time notice and feedback on a web-server so that clients can monitor what is going on in their house. Shashank shiva kumar jha, Vishwateja mudiam reddy, Tapan pokharna, and Naresh vinay's paper explains how this is run and regulated. Warsuzarina Mat Jubadi and Normaziah Zulkifli's "Programmable Infrared Accessory Light Switch" demonstrates how a TV remote can be used to control room lights and other appliances. In this case, an one infrared remote and one infrared receiver are utilized and coded in such a case that it retains the existing remote's frequency and uses it to operate appliances directly. As a result, we present the Arduino Uno with the Esp8266-01 Module. Not only that, but the most cost-effective option, nevertheless, it is also simplest in terms of programming and implementation. 79 Smart Home Automation Using IoT © 2023 by Mrs.Lakshmi B N, Dr. Ashwini N, Mr.S Satish Kumar Reddy.

### III. METHODOLOGY

#### Existing system.

Authors develop a remote control of lights, fans other home appliances. A pc based program develop for control the remote devices. It is a low cost system for control various devices. Proposed Andriod software for Arduino platform these both are open source software. This system is used to control various home appliances. The system available for less cost. Authors developed smart home system to control and manage home appliances of daily life for comfortable life for human being .

#### Proposed system.

The proposed model of home automation system contains server, actuators, sensors and microcontrollers. The hind-end server will be setup to controlling, monitoring of the sensor devices. The proposed home automation system will be remotely control by wireless technological communication devices like smart phones, tabs and other wireless devices remotely through Internet. In this proposed home automation system can be control, managed remotely of room temperature, automatic on and off fans, automatic lights on and off, etc. are automatically control and managed by home automation system. The proposed without interacting of human being the home automation system monitor as well as , fans on & off system, lights on & off system, check and control room temperature and humidity level by IoT related communication devices.

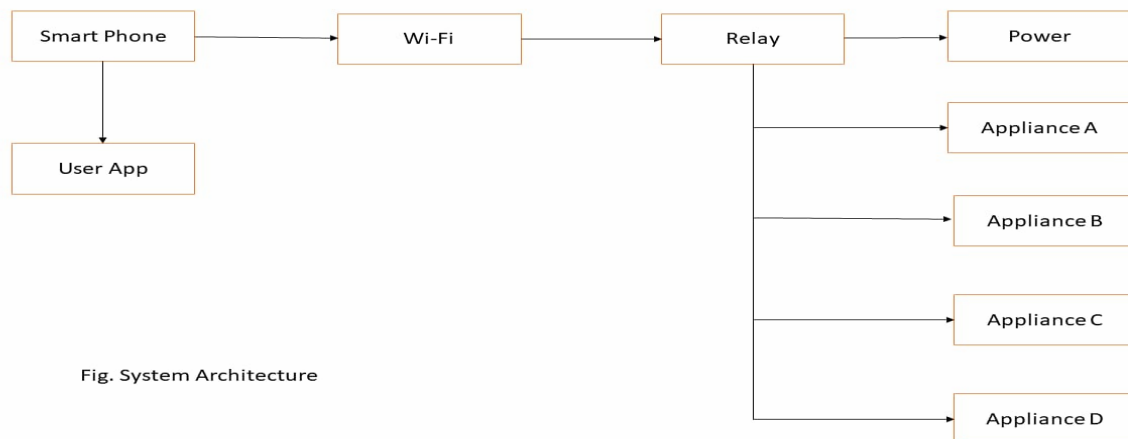


Fig. System Architecture

### IV. IMPLEMENTATION

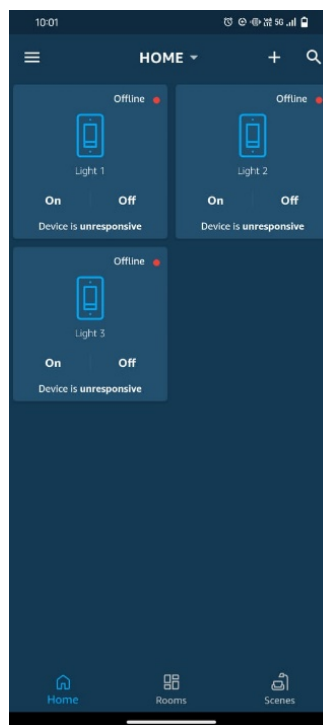
Implementing a home automation system involves several key steps. First, define your objectives, such as improving security or increasing energy efficiency, and set a budget that aligns with your goals. Next, choose a home automation platform, like SmartThings or Google Home, ensuring it supports the devices you plan to use. Select and purchase smart devices, such as lights, thermostats, and security cameras, that are compatible with your chosen platform. Plan the system architecture by ensuring strong Wi-Fi coverage and strategic device

placement for optimal performance. Proceed with installation by setting up the devices and configuring them through the automation platform. Test the system to ensure all devices and automations work correctly, and provide user training to help everyone operate the system effectively. Maintain the system by regularly updating firmware and troubleshooting issues as they arise. Finally, plan for future expansions and enhancements to keep your home automation system up-to-date with emerging technologies.



Fig block diagram.

## V.RESULTS



## VI. CONCLUSION

Based on the results of analysis of all data obtained by testing the smart home with the Internet of Things based Node MCU ESP6288 module, the conclusion of home automation with Internet of Things (IoT) based Node MCU ESP8266 Module can be designed with various components hardware and software support so that it can be arranged into a smart bulb system that is controlled with the Blynk android application according to what is intended. The home automation with this Internet of Things (IoT) based Node MCU ESP8266 Module can be implemented to control some of the home electronics performance including lighting controls, fan control, temperature monitoring, and etc.

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