

# HOME AUTOMATION USING UBIDOTS APPLICATION

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**Abstract** - Home automation has emerged as a significant technological advancement, enabling users to enhance their living spaces by integrating various devices and appliances for seamless control and monitoring. This abstract presents an innovative approach to home automation using the Ubidots app, a powerful platform that enables users to connect, visualize, and control their smart devices remotely. The proposed solution leverages the Ubidots app's capabilities to establish a comprehensive ecosystem for home automation. By connecting compatible devices such as smart thermostats, lighting systems, security cameras, and household appliances, users can centrally manage and monitor their home environment. The Ubidots app acts as a unified interface, facilitating seamless control over connected devices via a user-friendly dashboard accessible from smartphones, tablets, or computers. This ensures compatibility with a diverse array of smart devices available in the market, making it adaptable to various user preferences and requirements. The Ubidots app serves as a comprehensive platform that enables users to connect, visualize, and control their smart devices seamlessly, fostering a connected ecosystem for a smarter and more sustainable future.

**Index Terms** – Home automation, Ubidots app, connectivity, control, and smart living.

## I. INTRODUCTION

The term "home automation" the integration of various devices and systems within a home to create a smart and interconnected environment. It involves the use of technology to automate and control different aspects of a home, such as lighting, temperature, security, entertainment, and appliances. Home automation has emerged as a transformative technology, revolutionizing the way we interact with our living spaces. It involves the integration of various devices and systems within a home, allowing users to control and automate different aspects of their environment. With the advancements in wireless communication, network connectivity, and the Internet of Things (IoT), home automation has become more accessible and affordable than ever before. By incorporating smart devices such as thermostats, lighting systems, security cameras, and entertainment systems, users can enjoy a seamless and interconnected experience. Whether it's adjusting the temperature, turning on/off lights, monitoring security cameras remotely, or even managing entertainment systems with a single touch, home automation offers convenience, energy efficiency, enhanced security, and remote control capabilities.

Discusses the design and implementation of a home automation system with a focus on hardware and software integration[1].Presents a reliable wireless real-time home automation system based on Arduino Uno, highlighting its features and performance[2].Presents a home automation system that can be controlled via GSM, internet, and speech recognition, providing interactive control options[3].Focuses on remotely controlling home appliances using telephone lines and discusses the feasibility and challenges associated with this approach[4].Presents a phone-based remote control system for home and office automation, enabling users to control various devices via telephone[5].Explores the use of voice commands to remotely control home appliances, highlighting the benefits and challenges of this approach[6].Introduces a home automation system based on a Bluetooth home network, enabling wireless control and monitoring of home devices[7].Presents a smart enabling system for home automation, discussing its architecture and functionality[8].Presents a mobile-based home automation system that allows users to control and monitor their home devices using mobile devices[9].

Introduces a home automation system based on GSM technology and the App-Inventor platform for Android mobile devices[10].Presents a home automation system based on the FPGA platform and GSM communication, discussing its architecture and features[11].Introduces a GSM-based home automation system, highlighting its features, control options, and communication capabilities[12].Presents a Bluetooth-based home automation system that allows users to control home devices using their cell phones[13].Introduces a smart home automation system that incorporates various technologies and features for seamless control and monitoring[14].Presents an intelligent home appliance control system based on GSM technology, emphasizing real-time status updates and control options[15].Provides a literature review of smart home automation systems, summarizing key technologies, challenges, and benefits[16].Discusses home automation systems based on IoT technologies, exploring their applications and challenges[17].Reviews IoT-based smart home automation systems, highlighting their features, benefits, and prospects[18].Provides a review of smart home automation technologies and their applications, discussing recent advancements and potential future developments[19].

S.no	Applications of Home Automation	Recent Usage in 2022(India)	Percentage Used Globally
1.	Comfort & Lighting	668	75%
2.	Appliances	2452	45%
3.	Energy Management	270	20%
4.	Control & Connectivity	967	55%
5.	Others	1835	30%

Table 1: Usage of home automation and its growth globally in recent years.

From the above figure, the distribution of home automation devices can be visualized through a pie chart, which represents the proportion of different device categories in the overall landscape. The chart reveals that the largest share belongs to comforts and lighting, accounting for 31.8% of the total. This emphasizes the significance of automated appliance control in modern homes.

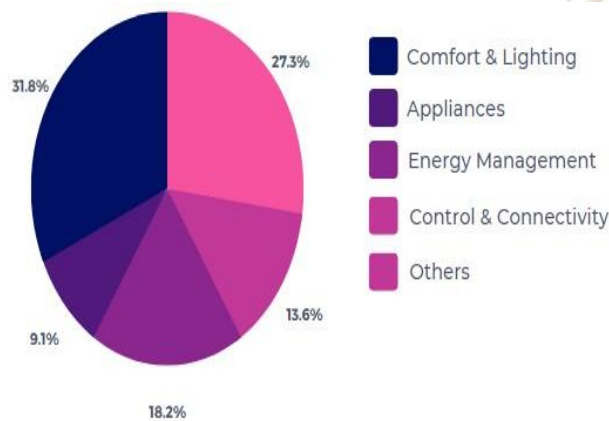


Fig.1 Usage percentage of home appliances through automation

Smart thermostats follow closely, comprising 27.3% of the pie, indicating their popularity in managing temperature settings and promoting energy efficiency. Smart control and connectivity systems hold a significant portion of 13.6%, reflecting the growing demand for advanced security features such as cameras, motion sensors, and smart locks. Smart entertainment and other systems contribute 9.1% to the chart, indicating the integration of audio/video systems and home theaters in automated setups. Additionally, smart appliances and other devices like smart plugs and locks each occupy 10% of the distribution, showcasing their relevance in enhancing convenience and connectivity within homes.

The above pie chart provides a comprehensive overview of the diverse categories of home automation devices and their respective contributions to the overall ecosystem. In this paper, we implement the technology to monitor and control home appliances through the Ubidots application. The instruction is sent from the Ubidots app to control the appliances.

## II. EXISTING METHOD

The existing methodology in home automation is the centralized control approach. This methodology involves the establishment of a central control system that serves as the brain of the home automation setup. The central control system is a hub for connecting and managing various devices and subsystems within the home. It typically utilizes a combination of hardware and software components to enable communication and control. The methodology begins with the identification and selection of compatible devices, such as smart thermostats, lighting systems, security cameras, and appliances. These devices are integrated into the central control system, either wirelessly or through wired connections. The central control system provides a user-friendly interface, which can be a mobile app, touch panel, or web interface, allowing homeowners to interact with and control the connected devices.

Through the central control system, users can access and control different aspects of their home, including lighting, temperature, security, entertainment, and appliances. They can set schedules, create automation rules, and monitor the status of devices in real-time. The central control system acts as a bridge, facilitating communication between devices and enabling seamless coordination and synchronization among them. This methodology offers several advantages. It provides a unified and streamlined approach to home automation, allowing users to control multiple devices and systems from a single interface. It enhances convenience by providing remote access and control capabilities, enabling users to manage their homes even when they are away.

It also promotes energy efficiency through optimized scheduling and intelligent automation, helping users reduce their energy consumption and utility costs. Overall, the centralized control methodology forms a robust foundation for implementing home automation systems, providing a cohesive and efficient approach to managing and controlling various devices and subsystems within a home.

### III. PROPOSED METHOD

This section deals with various components utilized in this paper. The working, operational features, and specifications of the components used in this system are also explained briefly here. The block diagram of home automation using the Ubidots app is shown in the fig.2.

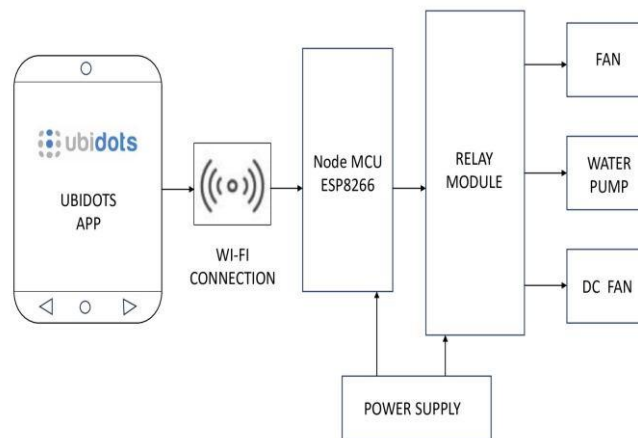


Fig.2 Block Diagram of Home Automation Using Ubidots App

The proposed method of home automation using the Ubidots app aims to provide users with a comprehensive and user-friendly solution for controlling and monitoring their smart home devices. The method revolves around integrating the Ubidots platform as a central control system, which enables seamless communication and interaction with a wide range of connected devices. By leveraging the Ubidots app on their mobile devices, users can remotely access and manage their home appliances, lighting systems, security devices, and other smart devices with ease.

S.No	EXISTING	PROPOSED
1.	The existing model may have limitations in terms of device compatibility.	The proposed model leverages the Ubidots platform, which is designed to be compatible with a wide range of smart devices from different manufacturers.
2.	The existing model may or may not provide similar remote accessibility features.	It emphasizes remote accessibility, allowing users to monitor and control using the Ubidots app

Table 2: Proposed model advantages over existing system

#### A. Working Flow

The working flow of the Home Automation using the Ubidots app prototype involves several steps. Firstly, the hardware setup includes connecting the NodeMCU ESP8266 microcontroller board to a power supply and linking it to a relay module. Home appliances like lights, fans, DC motors, and water pumps are connected to the relay module. In the Ubidots setup, an account is created on the Ubidots platform, and a new project is set up. Variables corresponding to the home appliances are created within the Ubidots project. The Ubidots app is installed on a mobile device and configured with the project credentials. The next step involves integrating Ubidots with the NodeMCU board by establishing a connection using the Ubidots API and implementing the necessary code on the board to receive control commands from the Ubidots platform. Using the Ubidots app, users can send control commands to the variables associated with the home appliances. The Ubidots platform then transmits these commands to the NodeMCU board, which triggers the relay module accordingly. Real-time feedback is provided to the Ubidots platform from the board, indicating the status of the home appliances, which is then displayed on the Ubidots app. Automation and scheduling can be set up through the app, allowing for automatic control of the appliances based on time-based triggers or specific conditions. The Ubidots platform offers data insights and analytics, enabling users to monitor energy consumption patterns and analyze usage trends. This data can be used to optimize energy usage and enhance the overall efficiency of the home automation system.

#### IV. DESIGN OF WORKING MODEL

The NodeMCU ESP8266 microcontroller board is used as a microcontroller here and it is connected to the power supply. Then relay module is connected to the NodeMCU board, ensuring proper wiring connection and the home appliances, including lights, fans, DC motors, and water pumps, are connected to the relay module.

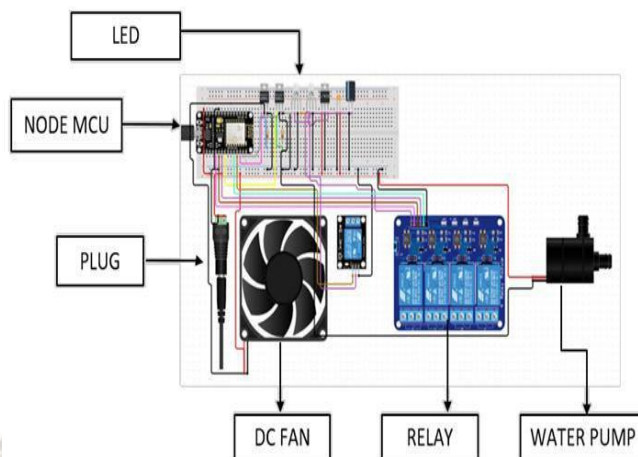


Fig.3 Circuit Diagram of Home Automation Using Ubidots App

In this workflow, users can control and monitor their home appliances using the Ubidots app, leveraging the capabilities of the NodeMCU board and the relay module to enable seamless automation and remote control of the connected devices.

#### V. RESULT ANALYSIS

This research suggests a concept for home automation using the Ubidots app. Compared to the existing system, which is done manually, this monitoring and controlling system makes the on and off the home appliances very much easier.

##### A. IoT Technology

In this system, a leading technology which is IoT has been implemented. Using this IoT, the control is sent from the mobile application to the appliance through the microcontroller. The user can access the home appliances wherever in the world using the Ubidots application

##### B. Output Analysis

Thus, the Arduino code and Ubidots application combine to give the result to control the appliances. In the Ubidots application, the buttons are used to control the appliances as shown in Fig. 4.

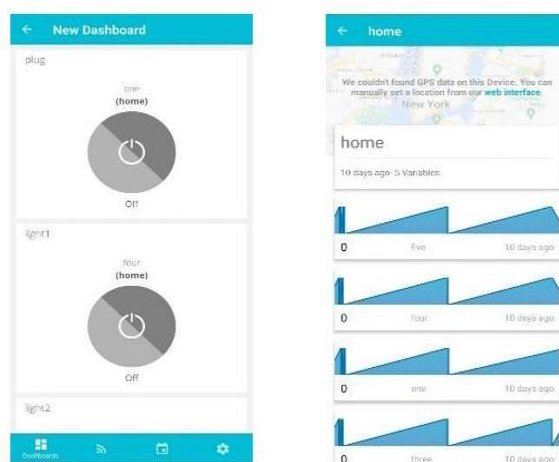


Fig.4 The Button and Usage History in Ubidots app

Figure 4 depicts the configuration of the Ubidots app layout which gives the daily usage of current that are used by the home appliance. These devices are then connected to the Ubidots platform, either wirelessly or through wired connections, to establish a communication channel. The Ubidots app is the primary interface, allowing users to control and monitor their connected devices from anywhere, at any time. This is the experimental outcome of a straightforward smart home prototype or the simple and affordable method

of controlling loads via Wi-Fi connection often employing the Ubidots app. The Ubidots platform offers data insights and analytics, enabling users to monitor energy consumption patterns and analyze usage trends. This data can be used to optimize energy usage and enhance the overall efficiency of the home automation system. Through this application, home appliances can be used anywhere in the world. Though this application is a third-party app we have developed the variables, Arduino code, and buttons to control the home appliances through our smartphone.

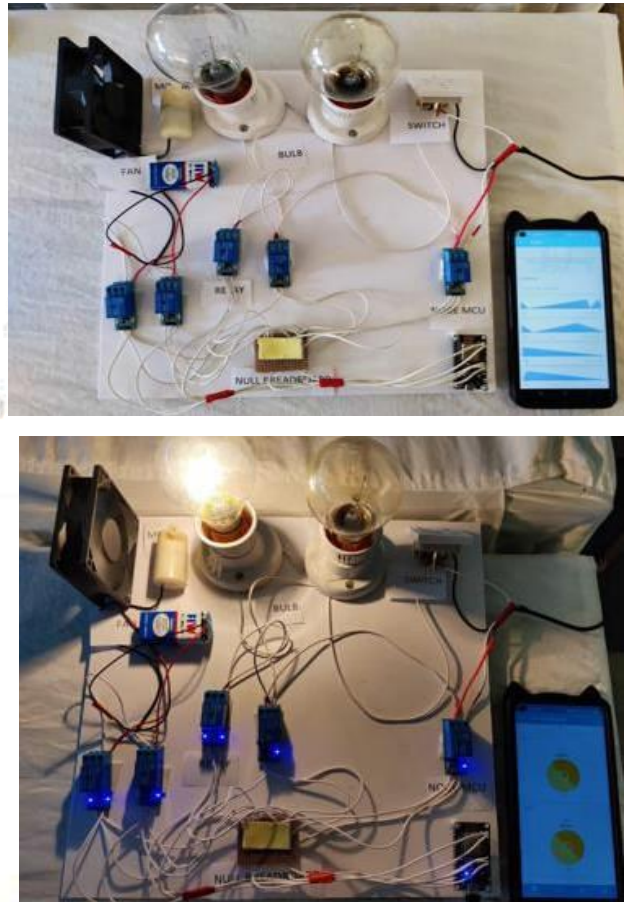


Fig.5 Hardware Setup of Home Automation using Ubidots App.

The hardware setup of the system is shown in Fig. 5. The picture depicts the experimental setup of the project and it contains two bulbs, one water pump, one switch plug, and a DC fan. In which the components are connected to the Node MCU microcontroller via a relay module. when the ON/OFF buttons in the UBIDOTS app are in On condition the home appliance will be in ON condition.

## VI. CONCLUSION

This paper illustrates the problems and potential applications of IoT devices in a home automation system. It reviews security risks and vulnerabilities, explains the integration and operation of several sensors, and suggests UBIDOTS as a major piece of software for capturing industrial data in the cloud. Integration methods and IoT problems are discussed. The integration of the Ubidots app in home automation offers a user-friendly and efficient solution for controlling and monitoring various devices within a smart home environment. The Ubidots app serves as a centralized control interface, enabling users to remotely manage their home appliances, create automation rules, and access real-time feedback and data insights. The Home Automation using Ubidots app prototype represents a promising step towards creating smarter and more connected homes, providing users with greater control and automation capabilities for improved comfort and efficiency.

## VII. ACKNOWLEDGMENT

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