



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 4, April 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com



IOT(Wi-Fi)Based Home Automation System

V.C.Sanap¹, Prathmesh Pawale², Vaibhav Thonge³, Shravani Pawar⁴, Aditi Patil⁵

Lecturer, Dept. of Computer Engineering, A.I.S.S.M.S. Polytechnic Pune, Maharashtra, India¹

Student, Dept. of Computer Engineering, A.I.S.S.M.S. Polytechnic Pune, Maharashtra, India^{2,3,4,5}

ABSTRACT: This paper presents the design and implementation of an Internet of Things (IoT) based Home Automation System (HAS) leveraging Wi-Fi connectivity. The system is aimed at providing remote control and automation of various household appliances, thereby reducing human intervention and enhancing user convenience. The core of the system utilizes the Node MCU platform, a popular open-source IoT solution, to execute automation processes. Different transmission modes are employed for communication between the user interface and the appliances via Node MCU. Cloud server-based communication is integrated to enable unrestricted access to appliances regardless of user location. A robust data transmission network is established to ensure seamless automation. The system features a user-friendly Android interface offering real-time appliance status updates and control options. Additionally, the system is designed to support elderly and disabled individuals in the home environment. According to this IoT-based Home Automation System using Wi-Fi connectivity offers an affordable, easy-to-install solution with improved functionality and enhanced living standards, aligning with the growing trend towards smart home concepts.

KEYWORDS: Home Automation System (HAS), Internet of Things (IoT), Wi-Fi Connectivity, Node MCU, Cloud Server-Based Communication, Smart Home.

I. INTRODUCTION

The Internet of Things (IoT) paradigm has revolutionized the way devices interact and communicate, assigning unique IP addresses to mechanical and digital machines. Initially rooted in connecting computers, IoT now extends to a vast array of interconnected devices, fostering an ecosystem where data exchange occurs seamlessly without human intervention. Forecasts indicate a dramatic surge in the number of connected devices, underlining the exponential growth potential of IoT. This growth is propelled by advancements in wireless technologies such as Bluetooth and Wi-Fi, enabling diverse devices to interconnect effortlessly. This paper focuses on leveraging Wi-Fi technology to develop an Internet-based Home Automation System (HAS) facilitating remote control and monitoring of household appliances. By utilizing Wi-Fi shields to transform Arduino boards into standalone micro web servers, the need for wired connections is eliminated, reducing costs and enhancing flexibility. Among the plethora of wireless options available, Wi-Fi emerges as a preferred choice for its robust capabilities and widespread compatibility with existing devices. Its ubiquity in modern laptops, notebooks, and smartphones further streamlines integration, promising cost efficiencies in system deployment. This paper delineates the design and implementation of a Wi-Fi-based HAS, emphasizing its suitability, affordability, and scalability within the realm of home automation. Through this endeavor, we aim to contribute to the burgeoning field of IoT by presenting a practical and accessible solution for smart home management.

II. RELATED WORK

This paper is to provide a low cost Home Automation System (HAS) using Wireless Fidelity (Wi-Fi). This crystallizes the concept of internetworking of Smart Devices. A Wi-Fi based Wireless Sensor Network (WSN) is designed for the purpose monitoring and controlling environmental, safety and electrical parameters of a smart interconnected home. The primary requirement of HAS to monitor and control of devices is accomplished using a Smartphone application. The control system (application) is developed using Blynk which is a popular cloud-based networking platform. It uses IOT to convert home appliances to smart and intelligent devices, with the help of design control. An energy efficient system is designed that accesses the smart home remotely using IOT connectivity. The proposed system mainly requires, Node MCU as the microcontroller unit and Arduino IDE to code the micro controller unit. To ensure, that the Wi-Fi connection do not turn off, the main controller is programmed to establish automatic connection with the available network. The Arduino Boards are interfaced with the appliances and programmed in such a way that they

respond to mobile inputs.

III. METHODOLOGY

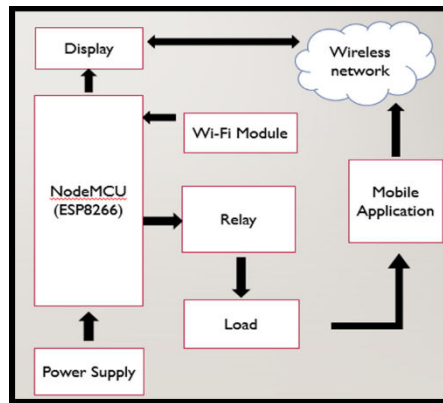


Fig 1: Block Diagram of proposed System

The above diagram gives the functionality of the overall project. The Node MCU unit is the microcontroller of the system. The user uses the mobile application in setting commands for functioning of the appliances. The mobile application interprets the command from user in switch mode and sends signal to the Node MCU unit, over a wireless network established by Wi-Fi communication. Hence the Wi-Fi module (actually inbuilt into Node MCU), helps the microcontroller establish Wi-Fi communication with a device and take commands from an application over wireless network. The Node MCU on further receiving the signal then turns on/off the appliance with the help of relay. The Node MCU, relay and the final appliances are physically connected. There is a power supply unit that powers the microcontroller, the relay as well as the final appliances. There is also a display unit that displays the status of the application.

IV. EXPERIMENTAL RESULTS

Figures shows the result of the IOT (Wi-Fi) Based Home Automation System. Fig ‘a’ shows the overall exemplar of the system. Fig ‘b’ shows the interface of the application used to control the framework whereas Fig ‘c’ depicts the exemplar when executed.



Fig a : Exemplar of System

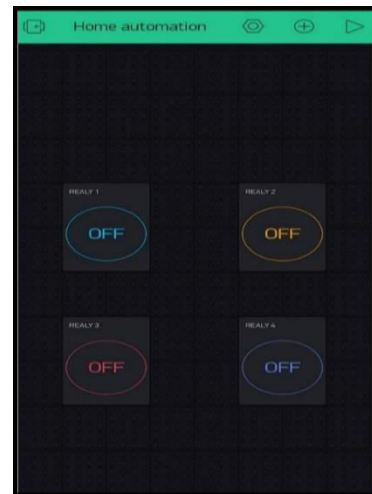


Fig b : Interface of Application



Fig c : Executed exemplar

V. CONCLUSION

It is evident from this project work that an individual control home automation system can be cheaply made from low-cost locally available components and can be used to control multifarious home appliances ranging from the security lamps, the television to the air conditioning system and even the entire house lighting system. With its compact design, the system can be discreetly integrated into any home environment. Rigorous testing confirmed its reliability across different appliances, showcasing its scalability and versatility. Project lays the foundation for future advancements in home automation, promising improved efficiency and convenience for users. By embracing innovation, we can continue to enhance the functionality and user experience of smart living solutions, ultimately transforming traditional homes into intelligent, connected spaces.

REFERENCES

1. "Smart Energy Efficient Home Automation System using IOT", by Satyendra K. Vishkarma, Prashant Upadhyaya, Babita Kumari
2. "IOT Based Smart Security and Home Automation", by Shardha Somani, Parikshit Solunke, Shaunak Oke, Parth Medhi
3. "A Dynamic Distributed Energy Management Algorithm of Home Sensor Network for Home Automation System", by Tui-Yi-Yang, Chu-Sing Yang, Tien-Wen Sung ; in 2016 Third International Conference on Computing Measurement Control and Sensor Network.
4. "Visual Machine Intelligence for Home Automation", by Suraj, Ish Kool, Dharmendra Kumar, Shovan Barman.
5. "A Low Cost Home Automation System using Wi Fi Based Wireless Sensor Network Incorporating Internet of Things", by Vikram.N, Harish.K.S, Nihaal.M.S, Raksha Umesh, Shetty Aashik Ashok Kumar, in 2017 IEEE 7th International Advance Computing Conference.
6. Wikipedia(2009). Home Automation. From https://en.wikipedia.org/wiki/Home_automation
7. Theory of IOT from <https://internetofthingsagenda.techtarget.com/definition/Intert-et-of-Things-IoT>
8. About Node MCU from <https://lastminuteengineers.com/esp8266-nodemcu-arduino-tutorial/>



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details