



Home Automation using Iot and wireless technology.

Pratiksha Ambhore^{#1}, Samiksha Vitonde^{#2}, Ashish Jagnade^{#3}, Shyam Tayade^{#4}, Prof. R. V. Patil^{#5}

[#]Computer Engineering Department, Savitribai Phule University Manjari (BK), Pune - 412307 (Maharashtra) India

Abstract— Home Automation is a system that allows users to control various appliances of varying kinds and also makes controlling of home appliances easier and saves energy. As the time the world is moving fastly towards automation. Home Automation is a bulding automation of home. Home automation gives you access to control devices in your home from a mobile device anywhere in the world. Individuals have less and ideal appportunity to deal with any work so automation is a basic approach to deal with any gadget or machine will work to our craving. This paper points to create and plan a Home automation using Arduino with Bluetooth module. In this paper a low cost and user-friendly remote- controlled home automation system is presented using Arduino board, Bluetooth module, smartphone, Relay module and wires. The proposed prototype of home automation system is implemented and tested on hardware and it gave the exact and expected results.

Keywords— Home Automation, Arduino, Bluetooth, Internet of things.

I.INTRODUCTION

Home automation system is use of information technologies and control system to reduce the human labor. The rapid growth of technologies influence us to use smartphones to remotely control the home appliances. An automated devices has ability to work with versatility, diligence and with lowest error rate. The idea of home automation system is a significant issue for zResearchers and home appliances companies. Automation system not only helps to decrease the human labor but it also saves time and energy.

IoT-enabled home automation systems typically involve the use of smart devices, such as thermostats, light bulbs, and security cameras, that can be controlled and monitored through a centralized hub or app. These smart devices can communicate with each other and with the centralized hub using wireless protocols such as Zigbee, Z-Wave, and Bluetooth.

Home automation gives you access to control devices in your home from a mobile device anywhere in the world. The term may be used for isolated programmable devices, like smart thermostats and sprinkler systems, but home automation more accurately describes homes in which nearly everything— smart light switches, ,appliances, smart outlates, heating and cooling systems—hook up to a remotely controllable network.

The proposed method presents the design and implementation of a robust, low cost and user friendly home automation system using Bluetooth technology. The design of proposed method is based on Arduino board, Bluetooth module, sensors and smartphone application. Bluetooth module HC-06 is interfaced with Arduinoboard and home appliances are connected with Arduino board via

relay.

Overall, IoT-enabled home automation can provide many benefits to homeowners, including increased convenience, energy efficiency, and security. However, it is important to ensure the security of these systems, as they may be vulnerable to hacking and other cyber threats.

Home automation system is use of information technologies and control system to reduce the human labor. The rapid growth of technologies influence us to use smartphones to remotely control the home appliances. An automated devices has ability to work with versatility, diligence and with lowest error rate [1]. The idea of home automation system is a significant issue for researchers and home appliances companies.

findings The domestic automation system can monitor and/or manage home attributes adore lighting, climate, enjoyment systems, and appliances. It is very helpful to control your home devices.

The phrase **smart home** refers to home automation devices that have internet access. Home automation, a broader category, includes *any* device that can be monitored or controlled via wireless radio signals, not just those having internet access. When connected with the Internet, home sensors and activation devices are an important constitute of the Internet of things(“IoT”)

In present years, wireless systems like Wi-Fi, Bluetooth have become more and more common in home networking. Also in home automation, the use of wireless technologies gives several advantages that could not be achieved using a wired network only.

When connected with the Internet, home devices form an important part of the Internet of Things (IoT). A home automation system basically links the controlled devices to a central hub, also called a gateway. The system has a user interface that operates either on wall-mounted terminals, tablet or desktop computers, or even a mobile phone application, or web interface, that can be accessed through the Internet.

Home automation gives you access to control devices in your home from a mobile device anywhere in the world. The term may be used for isolated programmable devices, like smart thermostats and sprinkler systems, but home automation more accurately describes homes in which nearly everything— smart light switches, ,appliances, smart outlates, heating and cooling systems—hook up to a remotely controllable network.

II. IMPLEMENTATION

When designing and creating a home automation system, engineers take into account several factors including scalability, how well the devices can be monitored and controlled, ease of installation and use for the consumer, affordability, speed, security, and ability to diagnose issues. Findings from iControl showed that consumers prioritize ease-of-use over technical innovation, and although consumers recognize that new connected devices have an unparalleled cool factor, they are not quite ready to use them in their own homes yet.

III. Methodology

A methodological diagram is frequently included in research publications to offer a visual picture of the approach utilized in the study. The proposed method presents the design and implementation of a robust, low cost and user friendly home automation system using Bluetooth technology. The design of proposed method is based on Arduino board, Bluetooth module, sensors and smartphone application. Bluetooth module HC-06 is interfaced with Arduino board and home appliances are connected with Arduino board via relay.

In the system, we have a mobile app which can be an MIT-app invented app or You can also download the app from the play store with the name home automation. there are many apps you can download the app as per your requirement We will also share the link below. So, The app will be connected to the Bluetooth HC-05 which is part of the control system and Bluetooth HC-05 receive the data from the android app. overview is beneficial. Contextualize the methodological diagram and provide the reader with a clear picture of the research process.

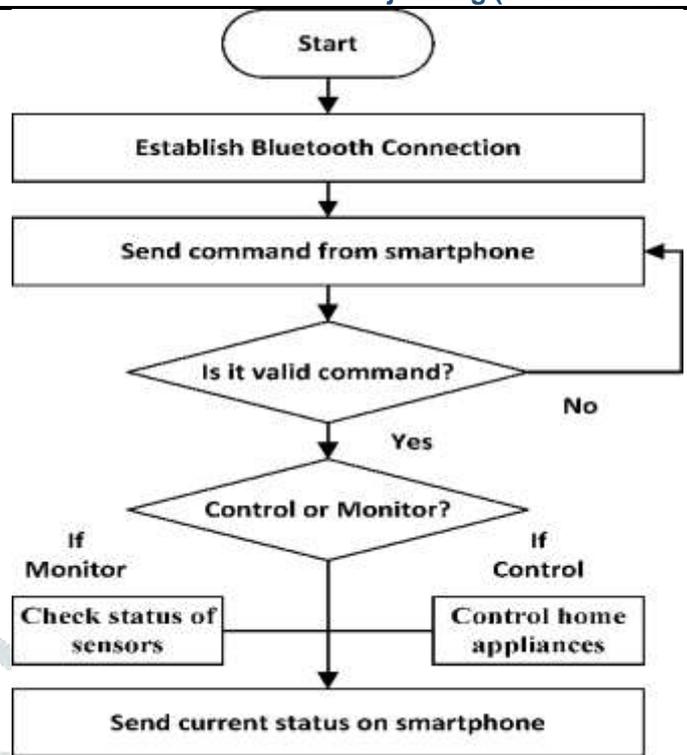
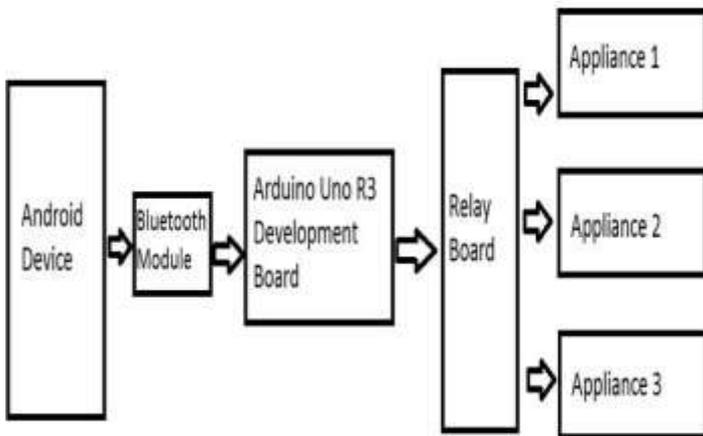


Fig. Flowchart of proposed system

Fig. Block Diagram of proposed system



A. SYSTEM DESCRIPTION

The proposed system has two main parts that are hardware and software. The hardware part consists of three main hardware components Arduino board, smartphone, and Bluetooth module. Software part consist of Arduino integrated development environment (IDE) We have programmed the Arduino with the help of Arduino IDE We have used C++ programming and Bluetooth terminal smartphone application which is used for wireless communication between smartphone and Arduino board.



B. HARDWARE USED

The proposed home automation system contains three hardware components smartphone, Arduino board and Bluetooth module. Smartphone is used to communicate with Arduino board using a smartphone application and Bluetooth technology. In this research work Bluetooth module HC 06 and Arduino Uno are used for hardware implementation.

A. Arduino Uno

The Arduino UNO is a standard board of Arduino. It was also the first USB board released by Arduino. It is considered as the powerful board used in various projects. Arduino.cc developed the Arduino UNO board. Arduino UNO is based on an ATmega328P microcontroller. The board consists of digital and analog Input/Output pins (I/O), shields, and other circuits.



B. Bluetooth module

HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration. As HC-05 Bluetooth module has **3.3V level for RX/TX** and microcontroller can detect 3.3 V level, so, no need to shift transmit level of HC-05 module. But we need to shift the transmit voltage level from microcontroller to RX of HC-05 module.

C. Relay module

A relay is an electrical switch that can be used to control devices and systems that use higher voltages. In the case of module relay, the mechanism is typically an electromagnet. The relay module input voltage is usually DC. However, the electrical load that a relay will control can be either AC or DC, but essentially within the limit levels that the relay is designed for.



IV. RESULT

The results of our research paper focused on The home automation system developed by us is Bluetooth based. According to the proposed paper the final outcome of this paper leads to the development of a home automation. After successfully implementing the above mentioned system. We tested the prototype from hardware as well as software point of view. In this work, a real-time home automation system has been successfully implemented which is quite effective in terms of performance and technology. Through this project home automation system has been created so that we can control the appliances like as light, fan, motor, etc.

based_home_automation_energy_management_and_smart_security_system/links/603789c492851c4ed595c367/Internet-of-Things-based-home-automation-energy-management-and-smart-security-system.pdf

[5] K. Bromley, M. Perry, and G. Webb, 2003 "Trends in Smart Home Systems, Connectivity and Services", www.nextwave.org.uk.

[6] M. Asadullah and K. Ullah, "Smart home automation system using Bluetooth technology", *2017 International Conference on Innovations in Electrical Engineering and Computational Technologies (ICIEECT)*, pp. 1-6, 2017.

[7] Majid Al Kuwari, Ramadan Abdulrahman et al., "Smart-Home Automation using IOT-based Sensing and Monitoring Platform", *IEEE 12th International Conference on Compatibility Power Electronics and Power Engineering*,



Proposed model of the system

V. CONCLUSION

In conclusion, a simple, low cost and user friendly home automation system has been presented in this paper. Either you are opting for full automation system or plug n play or DIY solutions, with a little programming background or some familiarity *with* electronics can help you create awesome home automation systems as per your needs.

In this work, a real-time home automation system has been successfully implemented which is quite effective in terms of performance and technology. The prime objective of our project is to use the Smartphone to control the home appliances effectively.

The main purpose of home automation system is to provide ease to people to control different home appliances with the help of android application present in their mobile phones and to save electricity, time and money.

VI. REFERENCE

- [1]. https://en.wikipedia.org/wiki/Home_automation
- [2]. <https://www.youngwonks.com/blog/What-is-home-automation>
- [3] Margaret Rouse, "internet of things (IoT)", *IOT Agenda*, 2019.
- [4] "Research and Markets: Global Home Automation and Control Market 2014-2020 - Lighting Control Security & Access Control HVAC Control Analysis of the \$5.77 Billion Industry", *Reuters*..
- [5]. https://www.researchgate.net/profile/Nura-Tahir/publication/349590729_Internet_of_Things-