iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** VIII **Month of publication:** August 2022

DOI: https://doi.org/10.22214/ijraset.2022.46285

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue VIII Aug 2022- Available at www.ijraset.com

Smart Home Automation System Using Arduino

C. Haritha Sri[1], K. Ammu[2], Dr. S. Saira Banu[3], Dr. G. Chinnasamy[4]
[1,2]*M.Sc.,Physics, Pachamuthu College of Arts and Science for Women, Dharmapuri, Tamil Nadu*
[3]*Professor, Department of Physics, Karpagam Academy of Higher Education, Coimbatore, Tamil Nadu*
[4]*Professor, Department of Physics, Pachamuthu College of Arts and Science for Women, Dharmapuri, Tamil Nadu*

Abstract: Smart home automation system enables us to control over home appliances using smart phones. This project is created on an Arduino board with android software and a Bluetooth module (HC-05). In the context of a smart home environment that emphasises interoperability, reliability, integration of smart homes and privacy in context. Bluetooth is used for physically disabled people allowing them to remotely control home appliances like lighting, heating systems, and security measures using a smartphone.
Keywords: Smart home automation, Wi-Fi technology, Arduino, android application.

I. INTRODUCTION

Smart phone is an example for enabling economic growth in the technology sector which plays a key role in our project since the smart phone is easily accessible and convenient to everyone. Many people with disabilities find difficulties such as to use traditional wall switches, thus this project offers a solution for remote control operation of any household appliance using a smartphone and the Bluetooth terminal application [1].

The Arduino board receives information from the android application using Bluetooth interface to switch the home appliances. The smart home should be contained with many machine-driven sensors such as PIR sensor and Humidity sensor, and customized systems for secure life elegance for controlling, management and co-ordination of home appliances in a comfortable, effective and secure way [2].

The sensors can be specialized in measuring temperature, humidity, light, and movement. The design is based on a standalone Arduino BT board and the appliances that are connected togetherusing Relays.

II. NEED FOR AUTOMATION

Houses have evolved throughout history, from caves with fire to warm and illuminate even torches and candles and finally the arrival of electricity, which has allowed increasing home comfort. Later, electronics arrived allowing the use of the appliances, being able to perform programming routines and regulation processes.

1) *Savings:* With all the connected electrical devices that are inclusive of getting to know coolers, sprinklers which might be clever, lights which might be wireless enabled, tracking the electricity retailers in addition to water heating and cooling modules that will also reduce energy and water use.
2) *Control:* An automated device can replace good amount of human working force, moreover humans are more prone to errors and in intensive conditions the probability of errors increases whereas, an automated device can work with diligence, versatility and with almost zero error.
3) *Convenience:* Having the majority of our lounge and room lightings interchanged as you achieve your property remotely, the home theater and TV consequently betting your favorite melody and the front entry opens naturally when you approach it with hands total of acquiring stuff, is maybe the end rich highlights of the astute and home. In any case, solace and harmony isn't about sumptuous and simple life, shrewd locks can likewise give you a chance to allow with privilege of section of the particular people at exact examples and not generally, so also, sensor lets you know while your fridge vacant or out of stock encourages you to "arrangement" your entrance or leave entryway from where ever inside this world.
4) *Security:* They are also clear, connected responses for wellbeing for the sharp home that are sensibly estimated choices for each checking security verified frameworks. Remote empowered CCTV cameras associated development sensors not withstanding astute smoke cautions might be observed from interior or outside a local utilizing a video live, electronic mail and ready writings.

©IJRASET: All Rights are Reserved

5) *Safety:* Sensors that are verified that can discover spillage of water, phase of stickiness, carbon dioxide, development, warmness, and each ecological issue that could be envisioned assistance keep occurrence from transforming into catastrophes as they could speak with proprietor legitimately, on each event you're, wherever you need. Senior autonomy Automate sound update notwithstanding voice actuated ready frameworks are just a group of the elements of local mechanization that help seniors have free existence for a greater drawn-out time span. Moreover, cameras connected to the Wi-Fi with – way report may furthermore help friends and family hold a watch on the senior inhabitants when they can't go and real beware of them.

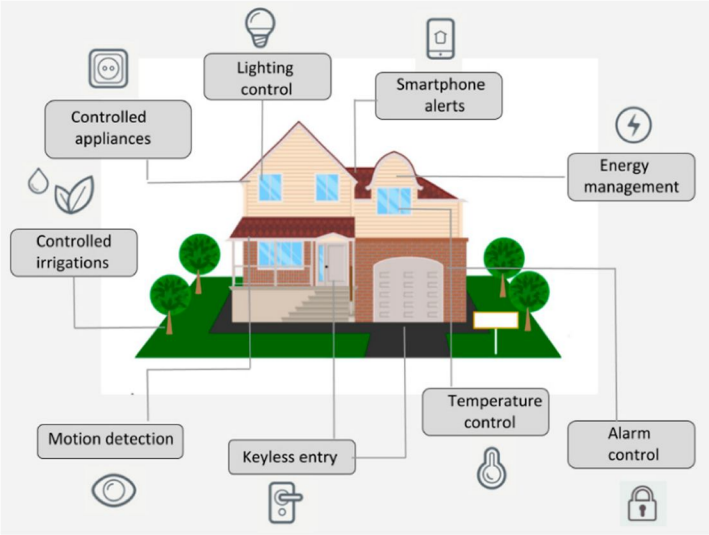


Fig 1. Home Automation System

III. LITERATURE REVIEW

The home automation system that uses Wi-Fi technology consists of three main components which presents system care that control and monitors user's home and hardware interface module. The concept of using android phone is to control their home appliances from anywhere at home [5]. The application has been developed based on the android system. Raspberry Pi proves to be a powerful, economic and efficient platform for implementing the smart home automation [3].The factors such as range, security, data rate, cost and accessibility has been analysed [4]. Smart homes have been used to face environment future challenges [6]. Artificial intelligence systems can also be employed in smart home automation systems [7].

IV. PROBLEM STATEMENT

In the present-day home automation is becoming essential for the purpose of improving our life condition. Convenience and ease of using home appliances is what home automation is offering. Home automation offers a futuristic way of life in which an individual gets to control his entire house using a smart home, from turning on a TV to locking/unlocking doors; it also offers an efficient use of energy. But to get or acquire such system installed will cost a lot of money and that is the major reason of why home automation has not received much demand and attention, adding to that also the complexity of installing it and configuring it. Thus, it is essential to make it cost effective and easy to configure, if this is granted to people then will be willing to acquire it in their homes, offices and schools. In other words, a system modification for the home automation is required in order to lower the price of applying it to houses.

V. PROPOSED WORK

Home automation describes a system of networked, controllable device that work together to make your home more comfortable, customized, efficient and secure. In this device there are four main parts Arduino, Bluetooth module, Relay drivers, android application. The Bluetooth module is connected with Arduino to Rx and Tx pin that provides the information to the microcontroller. Microcontroller reads the information and send to the relay drivers which work as switch. In Arduino we upload the program as per requirement then it performs some mathematical and logical operation to control the relay drivers.Android application are connected to the Arduino Bluetooth (HC-05). The designing of home automation is going to become simpler and more popular because most of people uses smart phone now days.

In this device we are using Arduino which is most commonly used device for automation. Arduino is a hardware which is used to connect computer and the project model so that we can control it by using Arduino code accordingly. Arduino is a microcontroller it is just like human brain it processes information and then it performs some Logical and mathematical operation on that information. Arduino is connected with the Bluetooth module which receives the information from user. Arduino also connected relay, which receives information from Arduino and perform the operation as switch. Bluetooth technology is Wireless radio transmissions in a short distance providing a necessary technology to create intelligence and controllability. This generates personal area network in home environment, where all these appliances can be interconnected and monitored using a microcontroller with Arduino using smart phone. Home automation involves a degree of computerized or automatic control to connected to relay drivers and four relay are connected to the home appliances.

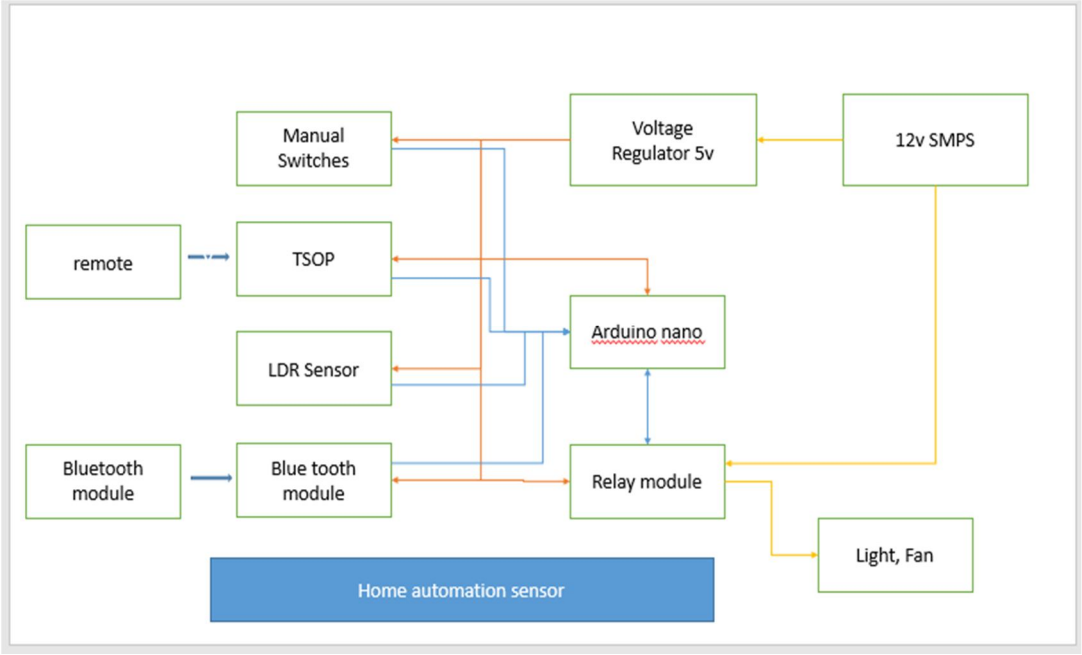


Fig 2. Block Diagram of Home Automation System

A. Wi-Fi Technology Specifications

1) Power supply: +3.3V DC 50mA
2) Emission power: <=4dBm, Class 2
3) Speed: Asynchronous 2.1 Mbps(Max)/160
4) Range: <100m
5) Operating Voltage: 4V to 6V
6) Operating Current: 30mA
7) Sensitivity S: <=-84dBm, Class 2
8) Default communication: Slave
9) Default mode: data mode
10) Baud rate: 9600,8,N,1

The Arduino modified with predefined libraries and changes transfers to OFF position when the circuit is turned-on. The status of load is displayed in the LCD and the respective number is passed through Bluetooth app by receiving the same number in Arduino Uno if an appliance is in OFF condition,so that relays are made to HIGH trigger and switch ON the appliance for re-displaying status of change in that load in the LCD, and the LED glows due to forward bias which indicates supply to the home appliances.
The status of the load is displayed in the LCD and the respective number is passed through Bluetooth app by receiving the same number in Arduino if an appliance is in ON condition, so that the relays are made to LOW trigger and switch OFF the home appliances.

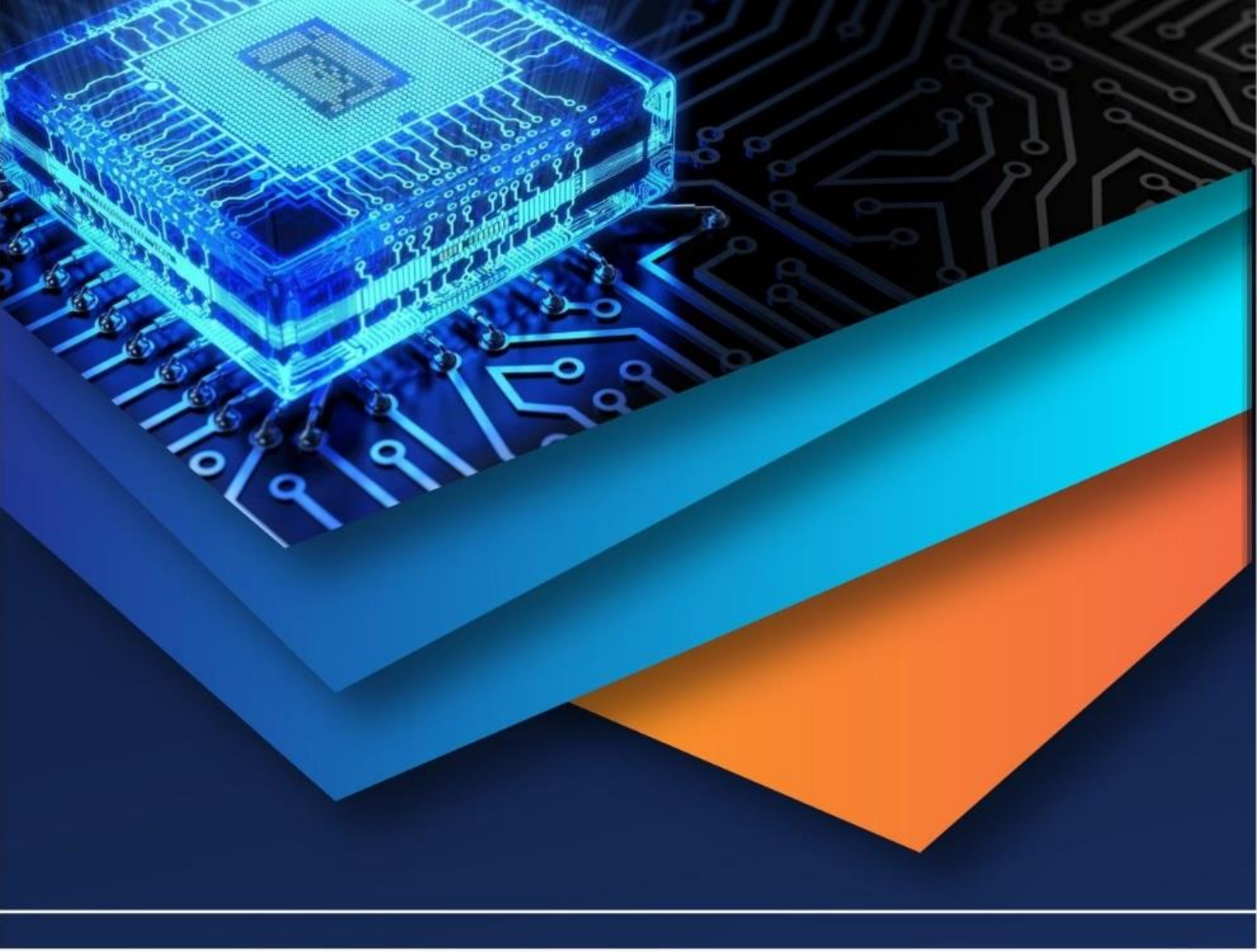
VI. CONCLUSION

This technology resolves immovability of the disabled people. The home automation system allows the home appliances toswitch ON and switch OFF with the respective input received from the Bluetooth interfaceand the state of the home appliances are displayed in the LCD by installing android application in the smartphone of user's.

REFERENCES

[1] Prof. SantwanaGudadhe et al, "Home Automation Systems using Android Applications", International Journal of Innovative Re search in Science, Engineering and Technology, Vol. 8, Issue 4, April 2019.
[2] Amirah Aisha BadrulHishama et al, "Bluetooth-Based Home Automation Using an Android Phone", UniversitiTeknologi Malaysia, Article: 20 May 2014.
[3] NikithaWanjale et al, "Bluetooth Based Home Automation", International journal of scientific engineering and technology research, Vol.03, Issue.12, June 2014
[4] K.Umapathy et al, "Bluetooth Controlled Electronic Home Appliances System", International Journal of Research Publication and Reviews, Vol.02, Issue.3, 2021 pp. 309-313.
[5] R. Piyare and M. Tazil, "Bluetooth based home automation system using cell phone," 2011 IEEE 15th International Symposium on Consumer Electronics (ISCE), Singapore, 2011, pp. 192-195
[6] Sathesh et al, "Smart Home Environment Future Challenges and Issues – a Survey", Journal of Electronics and Informatics (2021), Vol.03/No.01, pp.1-14
[7] MoupriyaSarkar et al, "Smart Home Using Artificial Intelligence", "BKGC SCHOLARS", 2020, Vol.1, issue 2, pp.69-74

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)