iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** V **Month of publication:** May 2020

DOI: http://doi.org/10.22214/ijraset.2020.5170

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: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

Smart Automation using IoT

Joel Manikyam Manne[1], Anil Kumar Bandani[2], Kushal Raj Bargela[3], Rajeshwari Antha Reddy[4], Akhil Datta Bhimana[5], Maruthi Ganesh Bhegari[6]
[1, 2, 3, 4, 5, 6]*BV Raju institute of technology, India*

Abstract: ***This paper proposes an economical implementation for IoT (Internet of Things) used for monitoring and controlling the home appliances via the Internet. The home automation system uses portable devices such as Smartphones, laptops as a user interface. They can communicate with home automation networks through the Internet. This project aims at controlling home appliances via Smartphone's using Wi-Fi as a communication protocol and an affordable and flexible home control system using a Raspberry pi as a server system. The user can move anywhere and can remotely control home appliances like lights, fan and door lock, through an easy application.***
The Raspberry pi which acts as the server will be interfaced with relay circuits that control the appliances running at home. The communication with the server allows the user to select the appropriate device. The server communicates with the corresponding relays. This automation system is very useful for people who have physically challenged. The other reason to develop this system is to save time and manpower along with maintaining security and convenience.
Index Terms: Smart Automation, IoT, Raspberry Pi, Internet Protocol, Blynk Server, Home Automation and Control.

I. INTRODUCTION

In today's world automation plays a crucial role in all working places and living homes. The smart home automation system is revolutionary these days where several home appliances producing companies are interfacing automation system in their devices. A smart home automation system has become very useful for handicapped people. In this system, home appliances and computers can be monitored and controlled through a user-friendly interface. In this Smart home automation system, we designed it to remotely control lights, fans, and computers. Currently, automation techniques are implemented either using a computer or microcontroller. A computer is expensive to use and the microcontroller cannot run or handle multiple programs at a time. The Raspberry Pi is a single-board computer and can be used to overcome these problems. Raspberry Pi functions like a computer and it GPIO and USB ports. By using these ports we can control household appliances and can get status with the help of sensors. It can also be used for security and surveillance by interfacing cameras. Raspberry Pi uses Advanced Reduced Instruction Set Computing Machine (ARM) technology. ARM technology helps in reducing cost, heat and power consumption. Raspberry Pi has an SD card for storage options, where Raspberry Pi is also called a credit card-sized computer. To interface the users and appliances we need a platform that is popularly known as the Internet of Things (IoT). Internet of Things connects different real-world objects to provide proper communication, synchronization and interconnecting between various physical devices or appliances from any point in the world where the internet is available. Through IoT manual work is reduced and automated work is highly improved. The automated system removes as much human interaction as possible. The major elements of the Smart home automation system using IOT are Raspberry Pi and Relay along with driving circuitry. Relays are used for driving high power appliances. Another key element that makes this system so brilliant is its ability to execute Python coded programs because of using Raspberry Pi. Python is meant to be an easily readable programming language that lets us work more quickly and integrate our systems more effectively. Among many wireless connections in the present situation, the Internet is chosen due to its suitable capability. Capabilities of the Internet are very much sufficient for implementing this design. Internet indirectly reduces the cost of the system as current mobiles and computers are coming with built-in internet connectivity options. The application is designed for interaction between users and appliances. This application contains all the control buttons for ON and OFF of lights, fans, computers, and other appliances. This makes the automation system more agile and adaptable for a vast developing society. It also provides convenience, comfort, security and saves energy. The automation system mainly reduces the use of electrical energy, light energy and other forms of energy which are non-renewable. By using WIFI, 4G and as well 5G is on the way there is no point of lack of internet connection it's easy to control simple appliances in one's home more efficiently. Another advantage is that the system is a noise-free system. This smart home automation system is designed to create a simple, efficient and accessible automation system that works smartly according to the predefined instructions set by the owner or end-user. Smart home automation system design mainly aims at creating an integrated smart security system that has the potential to turn a simple home into a truly smart home.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

II. MOTIVATION

This is a generation where technology is growing exponentially and we are part of it. Now a day's people are looking for convenience, energy management, connectivity, security, and luxury. The most desired factor is convenience in other words "Timesaver" and in today's world where everything is moving faster, every second has value i.e. work needs to be done quickly.

For example, cars get us faster where we need to go, phones get us information faster, and computers get's work done quicker. Smaller conveniences within the home are fascinating as a result of their permit the house to avoid wasting the user time besides.

Smart Home systems are one of the more current regions of research that have not been completely integrated into our society. For example some convenient technologies in the home like the dishwasher, washing machine, and microwave ovens.

In some cases, there may be physically handicapped people in the house and they are not able to move over and over for controlling appliances in the house, so using a home automation system can help these people to easily control all the appliances. For physically challenged people it is crucial to develop a home automation system that required less and very easy user interaction.

Home automation systems additionally improvise the quality of living and supply a simple, versatile and interactive interface. To provide all these functionalities at low cost and the flexible environment we need to implement modern technology and devices.

III. LITERATURE SURVEY

Harsh Mehta, Kunal Jadhav, Avinash Mishra, Prof. Anushree Deshmukh , Entitled as IOT BASED HOME AUTOMATION SYSTEM USING ARDUINO BOARD, [3] describes Currently, there are many Smart Home automation systems based on the Arduino uno as a server system. However, this system requires many additional extra components, which increases cost and circuit complexity. As Arduino do not contain in built Wi-Fi support, in order to interface Arduino and smart phone up on a network Wi-Fi is to be needed in this case an external Wi-Fi module is needed this results in complex circuitry. Arduino consume more power it's not power efficient. As well Arduino is not the best platform to future advancement as the speed of operation is low and do not support integrated development environment compared to Raspberry pi.

Naresh Kumar , Praveer Sing. Economical Home Automation System using Arduino UNO, [4] Leaving Wi-Fi, Zigbee and Bluetooth can also be used as an communication portals but these limits the control to within their respective range of the environment. As Bluetooth has the connectivity range of 100m as well respectively, Zigbee has a connectivity range of approx 10-100m line-of-sight.

Prof.H.B.Shinde, Abhay Chaudhari, Prafull Chaure, Mayur Chandgude Pratik Waghmare. Entitled Smart Home Automation System using Android Application, [5] Describes Home automation can also be done developing an application for smart phone which acts as an interface between server and mobile. By using this method at the user end this application need to be pre installed in their smart mobile.

Prof. Dr. Ashok .J, Chavan J. J, Patil P. V, Naik P. S. Advanced Control Web Based Home Automation with Raspberry Pi, [6] Describes Home Automation by deploying a web page. A simple web with some Tokens can be generated and used for controlling the appliances.

A. Hareware Design

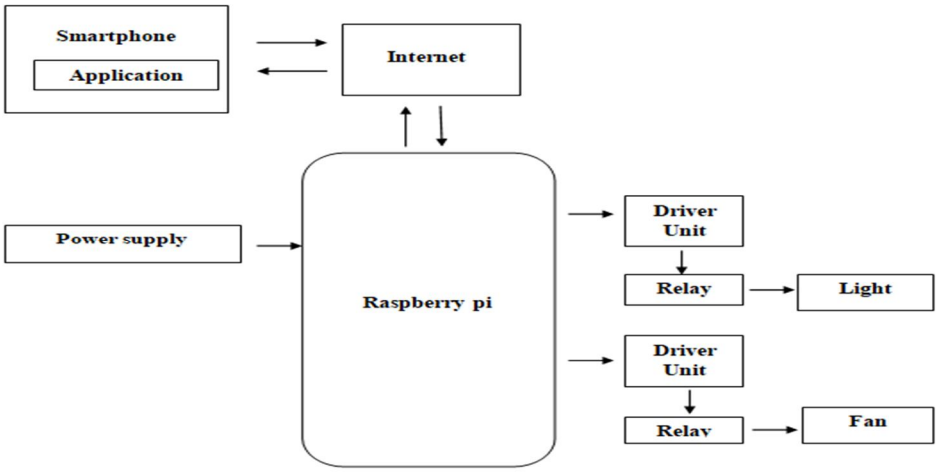


Fig: Block diagram.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

B. Raspberry Pi

The Raspberry Pi is a Economical, credit-card sized single board computer. It's capable of doing everything that a normal computer can do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games. All over the world, people use Raspberry Pi in a wide array to learn programming skills, build hardware projects, do home automation, and even use them in industrial applications.

C. Blynk Application

Blynk was designed for the Internet of Things. It can control hardware remotely. It is an application platform compatible with both Android and IOS. Responsible for controlling the Raspberry Pi over Internet.

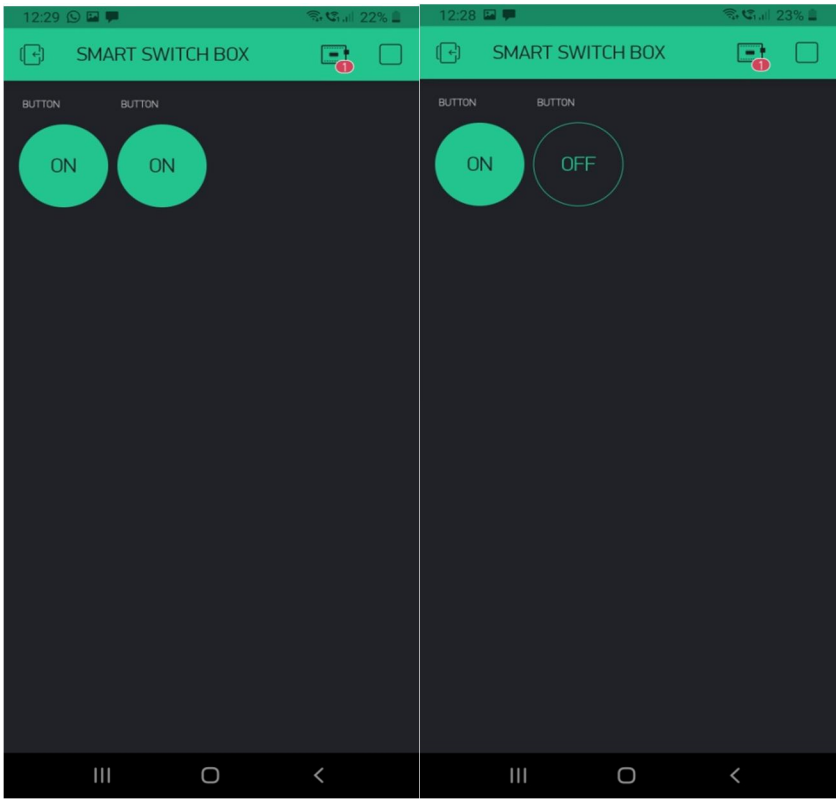


Fig: Application screen.

D. Blynk Server

Blynk Server is a cloud platform which is responsible for sending messages between application and Hardware (Raspberry Pi, Arduino…..).

Blynk library consists of the files which enables the communication between application and hardware and also decodes, process the incoming and outgoing commands.

E. Design

The automation system consists of both the hardware and software. Raspberry Pi, Driver unit and Relay are the hardware components.

Software are Raspbian OS, Blynk application and Blynk Server. The application developed is used for controlling the Raspberry PI Indirectly the home appliances.

F. Proposed Working

In the initial stage initialize the pin which is going to be used as an output from Raspberry Pi.

Creating a app is difficult Blynk made it simple. After the app development establish the connection between Raspberry Pi and Smartphone. With the help of developed application commands are sent to sever which process the received command and acts accordingly, either ON or OFF the appliances.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

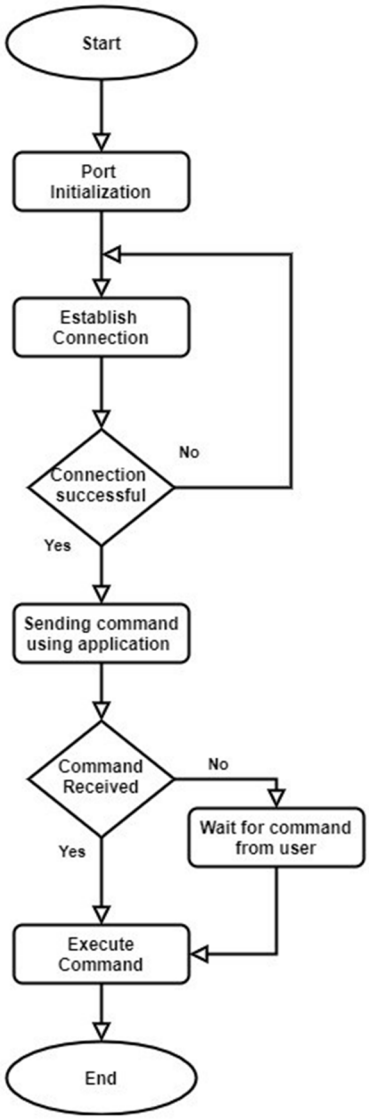


Fig: Flow chart.

IV. RESULTS

The below figure is the proposed model of home automation system.

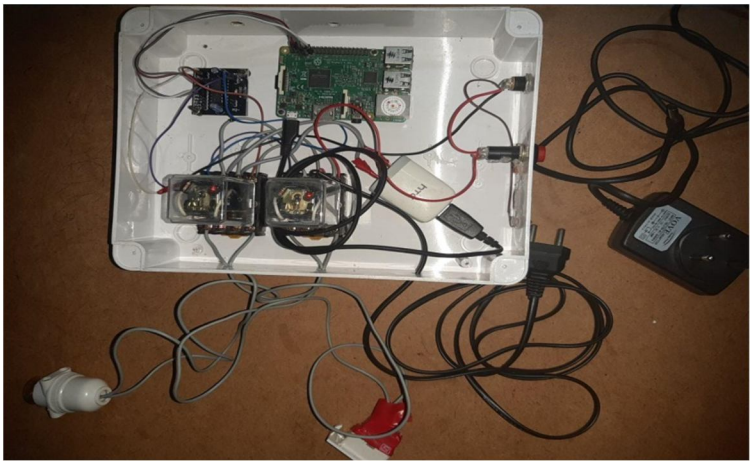


Fig: Proposed Model

It's been observed that the application works flawlessly. The below figure shows the working of a application.

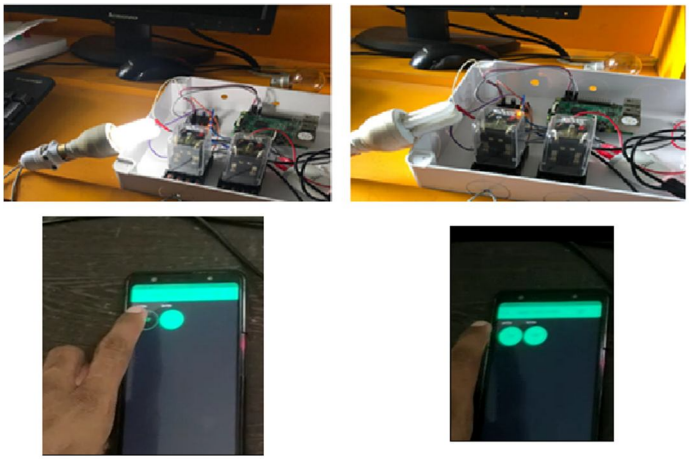


Fig: Working of application.

V. CONCLUSION

In this advanced world we have developed and introduced a home management system to make human life more comfortable. Our system basically deals with common problems faced by people in day to day life. User barely needs a mobile and an android application present in that mobile. By using today's highly developed boards we are actually managed to make it with low cost, flexible smart home system. This provides user-friendly automation with good performance. Real-time home Automation, monitoring, and controlling of applications remotely are few applications that this system can flawlessly do without any issues. The system integrates electrical devices in a house with each other as well as the control of domestic activities, such as TV, fan, electric tubes, refrigerator, and washing machine. Through this system most of the human interactions are eliminated. Development of such Smart Home achieves by using Internet of Things (IOT). It is an absolute affordable system for all the people who want to make their home as smart home.

REFERENCE

[1] Mane, Miss. Pooja Pol, Mr. Amar Patil, Prof. Mahesh Patil. IOT based Advanced Home Automation using Node MCU controller and Blynk App, International journal of Advance Research in Science and Engineering Volume No.0.7, Special issue No.03, February 2018

[2] Vamsikrishna Patchava, Hari Babu Kandala, P Ravi Babu, A Smart Home Automation Technique with Raspberry Pi using IoT, 2015 International Conference on Smart Sensors and Systems (IC-SSS)

[3] Harsh Mehta, Kunal Jadhav, Avinash Mishra, Prof. Anushree Deshmukh , IOT BASED HOME AUTOMATION SYSTEM USING ARDUINO BOARD, International Research Journal of Engineering and Technology (IRJET) Volume: 04 Issue: 01 | Jan -201

[4] Naresh Kumar , Praveer Sing. Economical Home Automation System using Arduino UNO, Advances in Computational Sciences and Technology ISSN 0973-6107 Volume 10, Number 6 (2017) pp. 1861-1866.

[5] Prof.H.B.Shinde, Abhay Chaudhari, Prafull Chaure, Mayur Chandgude Pratik Waghmare. Smart Home Automation System using Android Application, International Research Journal of Engineering and Technology (IRJET) Volume: 04 Issue: 04 | Apr -2017.

[6] Prof. Dr. Ashok .J, Chavan J. J, Patil P. V, Naik P. S. Advanced Control Web Based Home Automation with Raspberry Pi. International Journal of Advance Research, Ideas and Innovations in Technology ISSN: 2454-132X.

[7] Aishwarya D, Dr. J Arokia Renjith. (Enhanced Home Security Using IOT and Raspberry PI.) International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056 Volume: 04 Issue: 04 | Apr -2017 p-ISSN: 2395-0072, IRJET | Impact Factor value: 5.181 | ISO 9001:2008 Certified Journal | Page 3155.

[8] Monika M Patel , Mehul A Jajal, Dixita B vataliya . Home automation using Raspberry Pi International Journal of Innovative and Emerging Research in Engineering e-ISSN: 2394 – 3343 p-ISSN: 2394 – 5494 Volume 2, Issue 3, 2015.

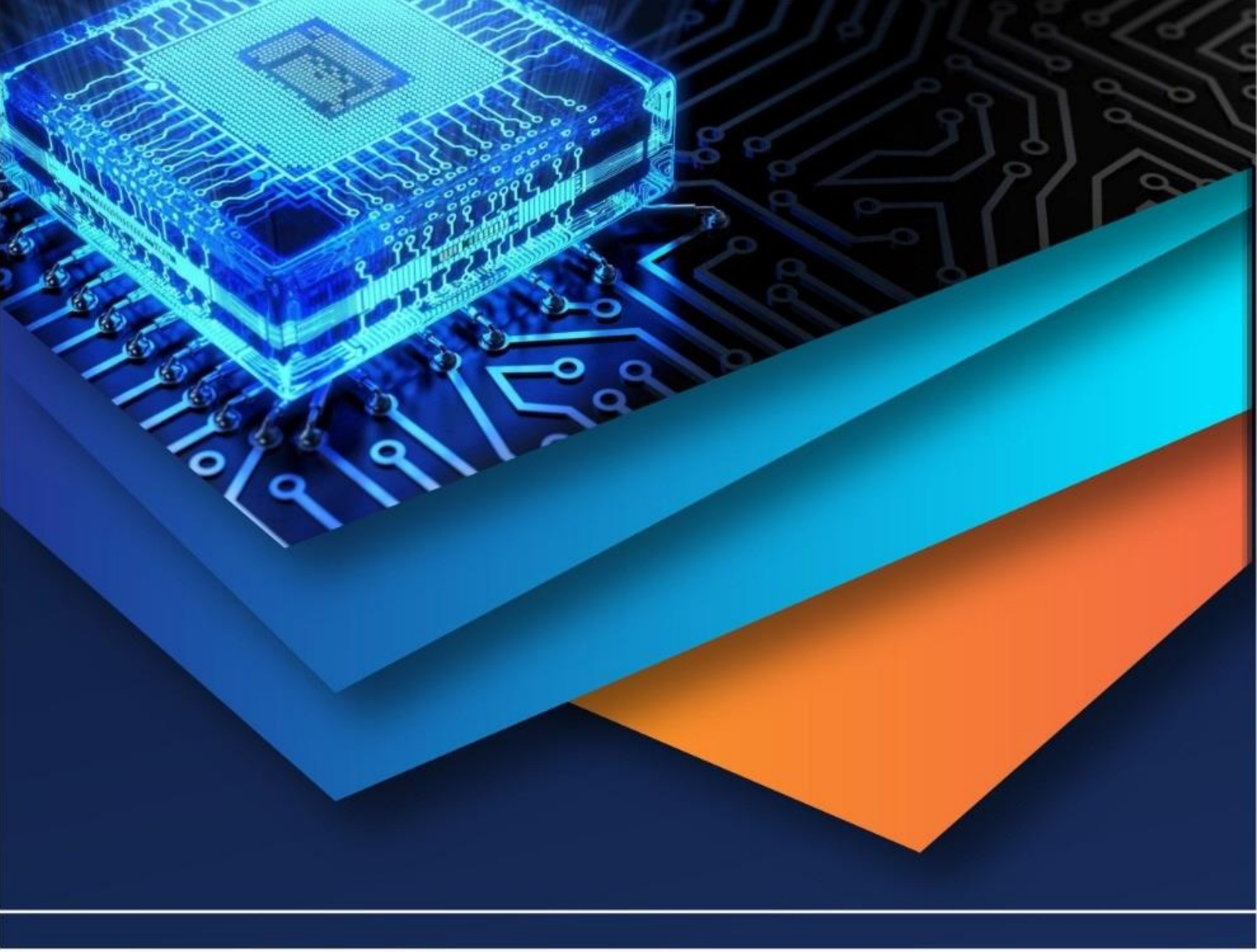
[9] Prof. Dr. Ashok .J, Chavan J. J, Patil P. V, Naik P. S. Advanced Control Web Based Home Automation with Raspberry Pi. International Journal of Advance Research, Ideas and Innovations in Technology ISSN: 2454-132X.

[10] Dr. M.L. Ravi Chandra, B. Varun Kumar, B.SureshBabu. IoT Enabled Home With Smart Security. International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS-2017).

[11] Aishwarya D, Dr. J Arokia Renjith. Enhanced Home Security Using IOT and Raspberry PI, International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056 Volume: 04 Issue: 04 | Apr -2017 p-ISSN: 2395-0072, IRJET | Impact Factor value: 5.181 | ISO 9001:2008 Certified Journal | Page 3155.

[12] Monika M Patel , Mehul A Jajal, Dixita B vataliya . Home automation using Raspberry Pi, International Journal of Innovative and Emerging Research in Engineering e-ISSN: 2394 – 3343 p-ISSN: 2394 – 5494 Volume 2, Issue 3, 2015.

[13] Pragati Ukey, Anita Shinde,Sneha Kasrung, Satish Kamble, Jidnyesh Kadu. Development Of Smart Home security system using Raspberry Pi, International Research Journal of Engineering and Technology (IRJET) Volume: 04 Issue: 06 June -2017.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY