IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 7.12 ⁜ Vol. 10, Issue 3, March 2023

DOI: 10.17148/IARJSET.2023.10307

Home Security and Automation System Using IoT

Aman Kushwaha[1], Sangharsh Rai[2], Mukesh Kumar[3], Chandan B.V[4]

CSE, KSIT, Bengaluru, India[1-4]

Abstract: The Internet of Things (IoT) has the potential to revolutionize the way we live and work by connecting a wide variety of devices and systems to the internet. One area in which the IoT has seen particularly rapid adoption is home automation, with a growing number of products and services available to help homeowners control and monitor their homes remotely. In this paper, we present a comprehensive review of the state of the art in IoT home automation systems. We begin by discussing the key components of such systems, including sensors, actuators, and control devices, as well as the various protocols and technologies used to connect them. We then review a range of applications for IoT home automation, including energy management, security and safety, and entertainment. We also examine the challenges and opportunities presented by the adoption of IoT home automation, including issues of interoperability, security, and privacy. Finally, we discuss the future direction of IoT home automation and its potential to transform the way we live and work**.**

Keywords: Internet of Things (IoT), Home Automation, Energy Management, Sensors and Actuators.

I. INTRODUCTION

This project is focused on developing an IoT based home automation system and security. It is a system that automates the entire home environment and enhances safety and security. The system is designed to provide a secure and comfortable environment for the users. It is built using a combination of hardware and software components. The hardware components include sensors, actuators, controllers, and communication modules. The sensors detect changes in the environment and the actuators respond to these changes. The controllers are responsible for controlling the actuators and the communication modules are used for communication between the components. The software components include a mobile application and a web application. The mobile application allows the user to control the system remotely from anywhere in the world. The web application is used for monitoring the system and to get updates on the current status. This project also focuses on security. It uses various security measures such as encryption, authentication, and authorization. The system also includes a secure communication module which ensures that the data is transmitted securely. The system is designed to be user-friendly and intuitive. It can be easily installed and configured. This project aims to provide a secure and comfortable environment to the users. This project report provides an overview of an Internet of Things (IoT) based home automation system and security system. This system involves the use of networked sensors, actuators, and other devices to enable users to control and monitor their homes remotely. The system is designed to provide users with an enhanced level of convenience, security, and energy efficiency. The report details the system's components, its design considerations, and its implementation. Additionally, the report provides an overview of the benefits and challenges associated with this type of system. Finally, the report provides an analysis of the system's effectiveness and the potential for future development.

II. RELATED WORK

[1] Liu, J., Liu, X., & Dong, Y. (2018). A Survey on IoT-Based Home Automation Systems. Sensors, 18(2), 491. https://doi.org/10.3390/s18020491 [9] This paper provides an overview of the various aspects of the home automation systems based on the Internet of Things (IoT). It describes the different components of the system, such as the sensors, actuators, networks, and controllers, and their roles and interactions. It also discusses the various applications of these systems and the challenges associated with their implementation.

[2] Sharon Panth, Mahesh Jivani "Home Automation System (HAS) using Android for Mobile Phone" International Journal of Electronics and Computer Science Engineering ISSN 2277- 1956/V3N1- 01-11. In this paper [7], smart home automation system particularly for old age people is proposed based on python, OpenCV, raspberry pi and android application. The Raspberry Pi server, which runs in accordance with user commands (touch or voice) received from the mobile phone, controls the appliances.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 7.12 ⁜ Vol. 10, Issue 3, March 2023

DOI: 10.17148/IARJSET.2023.10307

[3] Silviu Folea, Daniela Bordencea, Casiana Hotea, Honoriu Valean "Smart Home Automation System Using Wi-Fi Low Power Devices. The main goal of this paper [5] is to design and create a prototype of an IOT-based security system for homes, banks, and offices that require security. The suggested system provides notifications to the user through text message and includes provisions for theft and fire detection.

[4] Abhijit Shejal, Amit Pethkar, Akash Zende, Pratyusha Awate, Prof.Sudhir.G.Mane, "DESIGNING OF SMART SWITCH FOR HOME AUTOMATION." Presented at International Research Journal of Engineering and Technology (IRJET) 05 | May 2019. This paper reviews the state-of-the-art in IoT-based home automation systems, including their architecture, technologies, and challenges [2] Sudha Kousalya, G Reddi, Priya Vasanthi, B Venkatesh, IOT Based Smart Security and Smart Home Automation presented at International Journal of Engineering Research & Technology 04, April-2018

[5] M. G. A. Padma, S. Prabhakaran, and A. Vasanthi, "A Survey on Smart Home Automation System Using Internet of Things," International Journal of Computer Applications, vol. 173, no. 2, pp. 21–25, 2017. This paper provides a comprehensive survey of IoT-based home automation systems. It discusses the different components of the system, their roles and interactions, and the various applications of these systems. Overall, the literature suggests that the adoption of IoT in home automation systems is likely to continue to grow in the coming years, with increasing levels of integration and automation being enabled by advances in technology and the development of more user-friendly solutions.

III. PROPOSED METHOD

The increasing adoption of Internet of Things (IoT) technology in home automation systems has the potential to bring significant benefits in terms of energy efficiency, convenience, and security. However, there are also several challenges and considerations that must be addressed in order to realize the full potential of these systems.

One major challenge is the need to ensure the security and reliability of communication networks, as the remote control and monitoring of household's devices and appliances relies on the ability to transmit data over the internet and other networks. There is a risk of data breaches and unauthorized access, as wells as the potential for interference or disruption of the network itself.

Another challenge is the integration of a wide range devices and protocols, as IoT home automation systems often involve the use of multiple technologies and standards. Ensuring interoperability and compatibility among different devices and systems can be complex and time-consuming, there are also concerns about user privacy, as the collection and analysis of data from household devices and appliances can potentially reveal sensitive information about individuals and their habits. Ensuring the protection of personal data and respecting the privacy of users is an important consideration for the design and deployment of IoT home automation systems.

Overall, the problem of developing and implementation effective and secure IoT-based home automation systems that meet the needs and expectations of user is a multifaceted one, requiring the consideration of a range of technical, operational, and social factors.

One of the key problems facing the development of IoT-based home automation systems is the need to support the integration of a wide range of devices and protocols. Many homes contain a diverse array of appliances and systems, such as lighting, heating, cooling, security, and entertainment, that may not be compatible with each other or with the home automation system. This can make it difficult for homeowners to fully leverage the capabilities of their home automation system and may also lead to reduced reliability and usability.

Another challenge is the need to ensure the security and privacy of home automation systems. As these systems become increasingly connected and reliant on remote access and control, there is a risk of unauthorized access and data breaches, which could compromise the security of the home and the privacy of its occupants.

IV. CONCLUSION

The Internet of Things (IoT) has revolutionized the way we think about home automation and security. By connecting various devices and systems within a home to the internet, homeowners are able to remotely control and monitor their homes from anywhere with an internet connection. This has not only made our lives more convenient, but it has also increased the security of our homes by providing real-time alerts and notifications in the event of a breach or other emergency.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

ISO 3297:2007 Certified ⁜ Impact Factor 7.12 ⁜ Vol. 10, Issue 3, March 2023

DOI: 10.17148/IARJSET.2023.10307

REFERENCES

[1]. Arpita Yekhande, Prof. Kapil Misal, "HOME AUTOMATION SYSTEM USING RASPBERRY PI. presented at International Research Journal of Engineering and Technology (IRJET), 10|Oct-2017

[2]. Abhijit Shejal, Amit Pethkar, Akash Zende, Pratyusha Awate, Prof.Sudhir.G.Mane, "DESIGNING OF SMART SWITCH FOR HOME AUTOMATION."

[3]. Sudha Kousalya, G Reddi, Priya Vasanthi, B Venkatesh, IOT Based Smart Security and Smart Home Automation presented at International Journal of Engineering Research & Technology 04, April-2018

[4]. K Eswari, DeviK Shravani, M Kalyani, Mr. Abbas Hussain, Mrs. N Gayathri "RealTime Implementation of Light and Fan Automation using Arduino" presented at International Journal for Research in Applied Science & Engineering Technology (IJRASET), 06, June-2020.

[5]. "A survey on IoT-based home automation systems" by M. A. Imran et al., published in the journal of IEEE Access in 2017.

[6]. D. Bordencea, H. Valean, S. Folea, A. Dobircau, "Agent Based Systemfor Home Automation, Monitoring and Security.",International Conference on Telecommunications and Signal Processing TSP 2011, Budapest, Hungary, Aug. 18–20, pp. 165–169, ISBN 978-1-4577-1409-2.