HOME AUTOMATION SYSTEM USING "ARDUINO UNO" AND "ARDUINO IDE 2.1.1"

Akash D Girhe[*1], Tanshri M Wanjari[*2], Khushboo B Kewat[*3], Pravin S Lokhande[*4], Rohan R. Bhandopiya[*5], Nutan Dhande[*6], Abhishek K Singh[*7]

[*1,2,3,4]Student, Department Of Computer Engineering, Agnihotri College Of Engineering, Wardha, India.

[*5,6,7]Assistant Professor, Dept. Of Computer Engineering, Agnihotri College Of Engg., Wardha, India.

ABSTRACT

The rapid advancement of technology has brought forth innovative solutions to enhance the comfort, convenience, and security of modern homes. This paper introduces a novel Home Automation System (HAS) that leverages cutting-edge technologies to create an intelligent and interconnected environment within a household. The primary objective of this system is to simplify daily tasks, optimize energy consumption, and increase overall safety. This paper introduces a Home Automation System (HAS) that leverages the capabilities of "GSM" (Global System for Mobile Communications) and "IoT" technologies to create a smart and interconnected environment within a household. The primary objective of this system is to enhance user convenience, improve energy efficiency, and bolster security through seamless remote control and monitoring.

Keywords: Arduino Uno, MCU Node, GSM, IOT.

I. INTRODUCTION

In an era defined by the rapid convergence of technology and daily life, the concept of a "smart home" has become increasingly prevalent. The integration of Global System for Mobile Communications (GSM) and the Internet of Things (IoT) technologies has propelled home automation systems into the forefront of modern living. These systems have redefined the way we interact with and manage our homes, ushering in a new era of convenience, energy efficiency, and security.

The fusion of GSM and IoT technologies has given birth to a Home Automation System (HAS) that is both intelligent and interconnected. This system leverages the power of mobile communication and the vast network of IoT devices to create a dynamic and responsive living environment within the confines of our homes. By seamlessly integrating GSM and IoT, it empowers homeowners with unprecedented control, accessibility, and insights into their living spaces. This paper explores the exciting world of home automation systems, with a particular focus on those based on GSM and IoT technologies. We delve into the fundamental concepts, components, and capabilities of this innovative system, shedding light on its transformative potential in reshaping the way we experience and manage our homes. The advent of GSM-based home automation systems has introduced a remarkable level of convenience by enabling remote control and monitoring. In this paper, we will explore the various components and functionalities of GSM and IoT-based home automation systems, examine their applications in real-life scenarios, and highlight the potential for scalability and expandability.

II. OBJECTIVE

Following are the objective of the project:

- **Convenience:** Home automation simplifies daily tasks by allowing remote control and automation of various functions, such as lighting, heating, and entertainment systems.

- **Energy Efficiency:** Smart thermostats, lighting controls, and energy monitoring help reduce energy consumption, leading to cost savings and reduced environmental impact.

- **Security:** Integrated security features, like surveillance cameras, doorbell cameras, and smart locks, enhance home security and provide peace of mind.

- **Customization:** Homeowners can personalize their automation settings to match their lifestyle and preferences.

- **Accessibility:** Automation can make a home more accessible for individuals with disabilities, improving their quality of life.

- **Resale Value:** A well-implemented home automation system can increase the resale value of a property.

III.   LITERATURE SURVEY

Sudha Kousalya et.al [3] A smart home automation system implement by using Global System for Mobile Communication (GSM). In GSM based home automation systems, communication between main module and appliances is done through text messages .

Sudha Kousalya et.al [3] The wireless communication between the smartphone and Arduino UNO is done through Bluetooth technology. This will be more helpful for handicapped and aged people who wants to control appliances by speaking voice command .

K Eswari e.t [4] The home automation system is a mobile web-based application. This paper can be customized a lot as it has multiple GPIO port that can be programmed and they can give the user control over various things from his smart phone like security, surveillance, lighting, energy management, access control, entertainment .

K Eswari et. al [4] Home automation system should also provide a user-friendly interface on the host side, so that devices can be easily setup, monitored and controlled [4].

K Eswari et.al [4], proposed the architecture for smart home control and monitoring systems using Arduino is proposed and implemented.

Shreya Bhuguna et.al [7] , Brilliant locks and security and switches.

Shreya Bhuguna et.al [7] Controlled brilliant home machines.

Comparison Tabel :

Sr. No	References	Strong points	Week points
[1]	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.	A smart home automation system implement by using Global System for Mobile Communication (GSM). In GSM based home automation systems, communication between main module and appliances is done through text messages.	The main drawback of GSM based home automation system is that there is no guarantee text message deliver to the system every time.
[2]	K Eswari, DeviK Shravani, M Kalyani, Mr. Abbas Hussain, Mrs. N Gayathri "Real-Time Implementation of Light and Fan Automation using Arduino" presented at International Journal for Research in Applied Science & Engineering Technology (IJRASET), 06, June-2020	Smart home devices often communicate wirelessly to connect with each other and with a central hub or gateway. Popular wireless protocols used in IoT-based smart home systems include Wi-Fi, Zigbee, Z-Wave, Bluetooth, and Thread.	One of the biggest challenges is interoperability among devices using different wireless protocols. Not all smart home devices are compatible with each other, which can lead to a fragmented ecosystem where certain devices cannot communicate or work together seamlessly.
[3]	Shreya Bhuguna, karan karmyal "IOT in home automation" presented at International Journal for Research in applied science and Engineering Technology (IJRASET) 10|May 2022	Spending optimization in IOT and smart phone your family with transparency , subsequently , you will have the option to decrease your utility expenses altogether, furthermore , smart appliances are typically built to maximize resource efficiency	Smart appliances and IoT devices often come with a higher upfront cost compared to traditional alternatives. This initial investment can be a barrier for some families, especially those on a tight budget.
[4]	Shreya Bhuguna, karan karmyal "IOT in home	Spending optimization in IOT and smart phone your family with	Smart appliances and IoT devices often come with a

automation" presented at International Journal for Research in applied science and Engineering Technology (IJRASET) 10|May 2022	transparency , subsequently , you will have the option to decrease your utility expenses altogether, furthermore , smart appliances are typically built to maximize resource efficiency	higher upfront cost compared to traditional alternatives. This initial investment can be a barrier for some families, especially those on a tight budget.

IV. CONCLUSION

The fusion of GSM and IoT technologies in the context of Home Automation Systems (HAS) represents a significant leap forward in the evolution of modern living. As we conclude our exploration of this innovative realm, it becomes abundantly clear that GSM and IoT-based home automation systems have the potential to redefine the way we interact with our living spaces. They offer unprecedented levels of convenience, energy efficiency, and security, shaping homes into intelligent, responsive environments.

Hence , also we have successfully study of the previous paper and get the here system for the references in the

V. 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." Presented at International Research Journal of Engineering and Technology (IRJET) 05 | May 2019.

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

[5] Bouzid Mohamed Amine , Chaib Fatima Zohra , Hamani Ilyes , Aid Lahcen, Allaoui Tayeb, "SMART HOME AUTOMATION SYSTEM." Presented at International Journal of Robotics and Automation (IJRA) ,4 | Dec. 2018.

[6] Ayush Gajjar, Deepak Mishra, Shubham Ingale, Aniket Kore, "SMART HOME SYSTEM." Presented at International Research Journal of Engineering and Technology (IRJET) , 01 | Jan 2019.

[7] Shreya Bhuguna, karan karmyal "IOT in home automation " presented at International Journal for Research in applied science and Engineering technology (IJRASET) 10|May 2022.