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Smart Home Automation System Using IoT

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ABSTRACT: This IoT-based home automation project aims to provide a user-friendly and efficient solution for managing household appliances and systems. The project utilizes smart sensors, devices, and software to automate tasks such as energy usage optimization, security monitoring, health tracking, and personalization. The system is designed to learn the preferences and habits of individual users and adjust settings accordingly. The project has the potential to contribute to a more sustainable and secure future while improving the quality of life for users.

KEYWORDS: Internet of Things, home automation, sensors, efficient.

I. INTRODUCTION

In recent years, the Internet of Things (IoT) has revolutionized the way we interact with technology. The concept of IoT involves connecting various devices to the internet and allowing them to communicate with each other, creating a seamless and interconnected network. One of the most exciting applications of IoT is home automation, which involves using internet-connected devices to control and automate various tasks around the house. IoT based home automation systems have the potential to transform the way we live our lives, making our homes more comfortable, energy-efficient, and secure. With the ability to control everything from lighting and temperature to security systems and appliances, home automation systems can provide a level of convenience and control that was once unimaginable. From setting the perfect temperature to turning off the lights from the comfort of your couch, IoT-based home automation systems offer a wide range of benefits that can make your life easier and more enjoyable. However, developing such a system requires careful planning, attention to detail, and a good understanding of the various technologies involved.

II. LITERATURE SURVEY

Various systems are currently in use for home automation. Even though these systems are extremely usable, their practicality and constraints pose a problem in the process. The following are a few of the systems in place.

The system proposed by Muhammad Abbas Khan et al [1] is focused on making a home automation system describes various interconnection systems and data sources such as sensors, and actuators to enable multiple home automation implementations. The system is known as HAS (Home automation system). It operates by connecting the efficient API, which is the key to a straight forward and universal communication method.

Cristina Stolojescu-Crisan, et al [2] proposed Home automation has achieved a lot of popularity in recent years, as day-to-day life is getting simpler due to the rapid growth of technology. Almost everything has become digitalized and automatic. In this paper, a system for interconnecting sensors, actuators, and other data sources with the purpose of multiple home automations is proposed.

The system proposed by YasirMahmoodi al [3] is focused on The concept of the Internet of Things (IoT) is one of the fundamental technologies to attain the objective of affordable energy at home and environment sustainability. A home automation approach plays a significant role in managing efficiency and to improve the consumption of renewable energy resources. In this paper, an integrated cost effective, comfortable and reliable approach is proposed with IoT based home automation technique.

III. RESEARCH POSSIBILITIES

There are numerous research possibilities when it comes to IoT-based home automation. Here are a few ideas to get you started.

Security and Privacy: One of the major concerns with IoT-based home automation is security and privacy.



Researchers can focus on developing secure and privacy enhancing techniques that can be incorporated into the design of IoT-based home automation systems. This can include developing secure communication protocols, encryption techniques, and user authentication mechanisms.

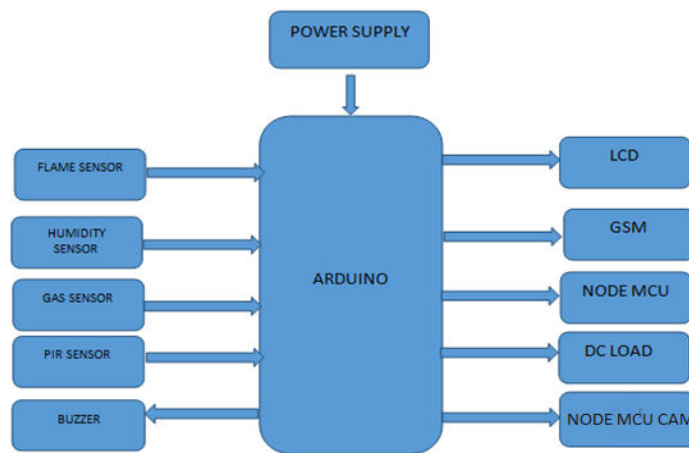
Energy Efficiency:IoT-based home automation can be used to optimize energy usage in homes. Researchers can focus on developing algorithms and models that can analyze energy usage patterns and optimize energy usage. This can include developing smart lighting systems, smart thermostats, and other energy-efficient devices.

Health and Wellness:IoT-based home automation can be used to improve health and wellness in homes. Researchers can focus on developing systems that can monitor and track health-related data, such as heart rate, blood pressure, and sleep patterns. This can help individuals to better manage their health and wellness.

User Experience:IoT-based home automation systems need to be easy to use and intuitive. Researchers can focus on developing user-centered design techniques that can enhance the user experience. This can include developing user interfaces that are easy to understand and navigate, and developing systems that can adapt to individual user preferences.

Interoperability:IoT-based home automation systems often consist of multiple devices from different manufacturers. Researchers can focus on developing interoperability standards that can ensure that these devices can communicate with each other seamlessly. This can include developing communication protocols and standards that can be used across different devices and platforms

IV. METHODOLOGY



4.1 ARDUINO

Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs – light on a sensor, a finger on a button, or a Twitter message – and turn it into an output – activating a motor, turning on an LED, publishing something online.

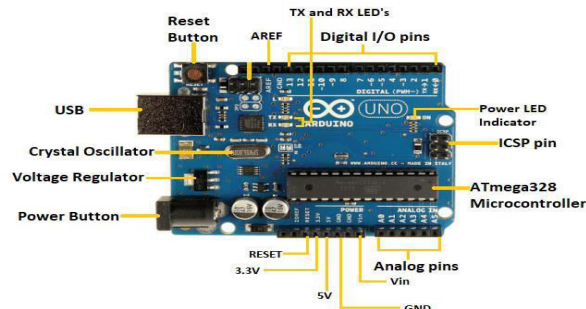


Figure 4.1 Arduino uno

4.2 FLAME SENSOR

A sensor, which is most sensitive to a normal light, it is known as a flame sensor. This sensor module is used in flame alarms. This sensor detects flame otherwise wavelength within the range of 760 nm – 1100 nm from the light source.

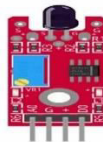


Figure 4.2 Flame Sensor

4.3 PIR SENSOR

The passive infrared sensor (PIR) detects both humans and animals up to 10 meters (30ft) away. The sensor can be used to detect the presence of humans in the room and at the front gate by detecting infrared light generated by a warm body and sending a signal to the ESP32.

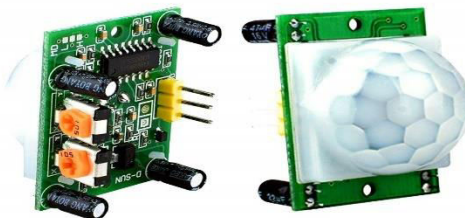


Figure 4.3 PIR Sensor

4.4 HUMIDITY SENSOR

The DHT11 is a low-cost digital temperature and humidity sensor. This sensor is simple to connect to any microcontroller.

To predict weather conditions, weather stations use these sensors too. Temperature sensors are utilized to monitor various environments and machinery, power plants, and manufacturing.

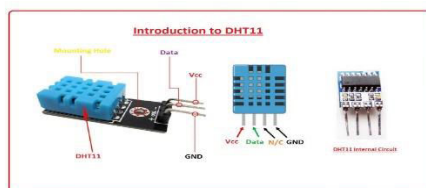


Figure 4.4 Humidity Sensor



4.5 GAS SENSOR

The gas sensor (MQ2) module detects H2, LPG, CH4, CO, alcohol and smoke or propane leaks.



Figure 4.5 Gas Sensor

4.6 LCD

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.



Figure 4.6 LCD

4.7 NODE MCU

Node MCU is an open source firmware for which open source prototyping board designs are available. The name “Node MCU” combines “node” and “MCU” (micro-controller unit). Strictly speaking, the term “Node MCU” refers to the firmware rather than the associated development kits. Node MCU can be used to control and automate home appliances and devices through Wi-Fi connectivity.



Figure 4.7 Node MCU

V. EXPERIMENTAL RESULTS AND DISCUSSION

The figure shown below is the hardware implementation of IoT Based Home Automation System and Login page.



Figure 5.1 Hardware Setup

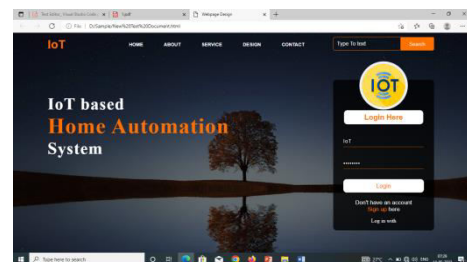


Figure 5.2 Login Page

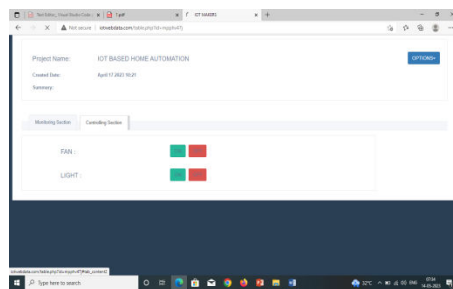


Figure 5.1 Controlling Section

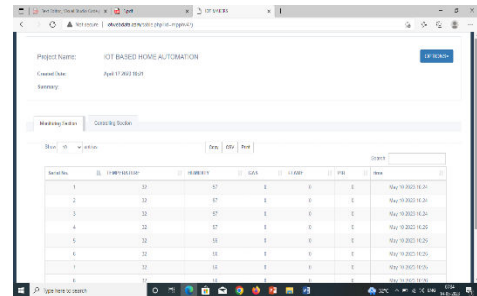


Figure 5.2 Sensor Reading Section

VI. CONCLUSION

The home automation utilizing Internet of Things has been tentatively demonstrated to work attractively by interfacing basic machines to it and the apparatuses were effectively controlled remotely through web. The outlined framework screens the sensor information, as well as impels a procedure as indicated by the necessity. The venture has been effectively outlined and tried. Coordinating elements of all the equipment parts utilized have created it. Nearness of each module has been contemplated out and put painstakingly in this way adding to the best working of the unit. Furthermore, utilizing very propelled IC's and with the assistance of developing innovation the venture has been effectively executed. Installed frameworks are rising as an innovation with high potential. In the previous decades microchip based installed framework governed the market. The most recent decade saw the insurgency of microcontroller based implanted frameworks. As to the prerequisites accumulated the manual work and the unpredictability in checking can be accomplished with the assistance of electronic gadgets.

REFERENCES

- [1] Muhammad Abbas Khan, Ijaz Ahmad, AnisNurashikinNordin, A. El-Sayed Ahmad, Hiren Mewada, Yousef Ibrahim Daradkeh, SaimRashead, Elasyed Tag Eldin and Muhamad Shafiq (2022) "Smart Android Based Home Automation System Using Internet of Things (Iot)" MDPI.
- [2] Cristina Stolojesu-Crisan, CalinCrisan and Bogdan-PetruButunoi (2021) "An IoT-Based smart Home Automation System". MDPI.
- [3]Mubashir Ali, ZarshaNazim, WaqarAzeem, Khadija Javed, Maria Tariq, Muhammad Haroon, Aamir Hussain (2020) "An IoT based Approach for Efficient Home Automation with ThingSpeak", International Journal of Advanced Computer Science and Applications, Vol. 11, No. 6.
- [4] Yasir Mahmood, Nazri Kama, AzriAzmi, SurayaYa'acob (2020), "An IoT based Home Automation Integrated Approach: Impact on Society in Sustainable Development Perspective", International Journal of Advanced Computer Science and Applications, Vol. 11, No. 1.
- [5] Mohamed S. Soliman, Majed O. Dwairi, Iman I. M. Abu Sulayman, Sami H. A. Almalki (2017) "Towards the Design and Implementation a Smart Home Automation System Based on Internet of Things Approach", International Journal of Applied Engineering Research, Volume 12, Number 11, pp. 2731-2737.



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