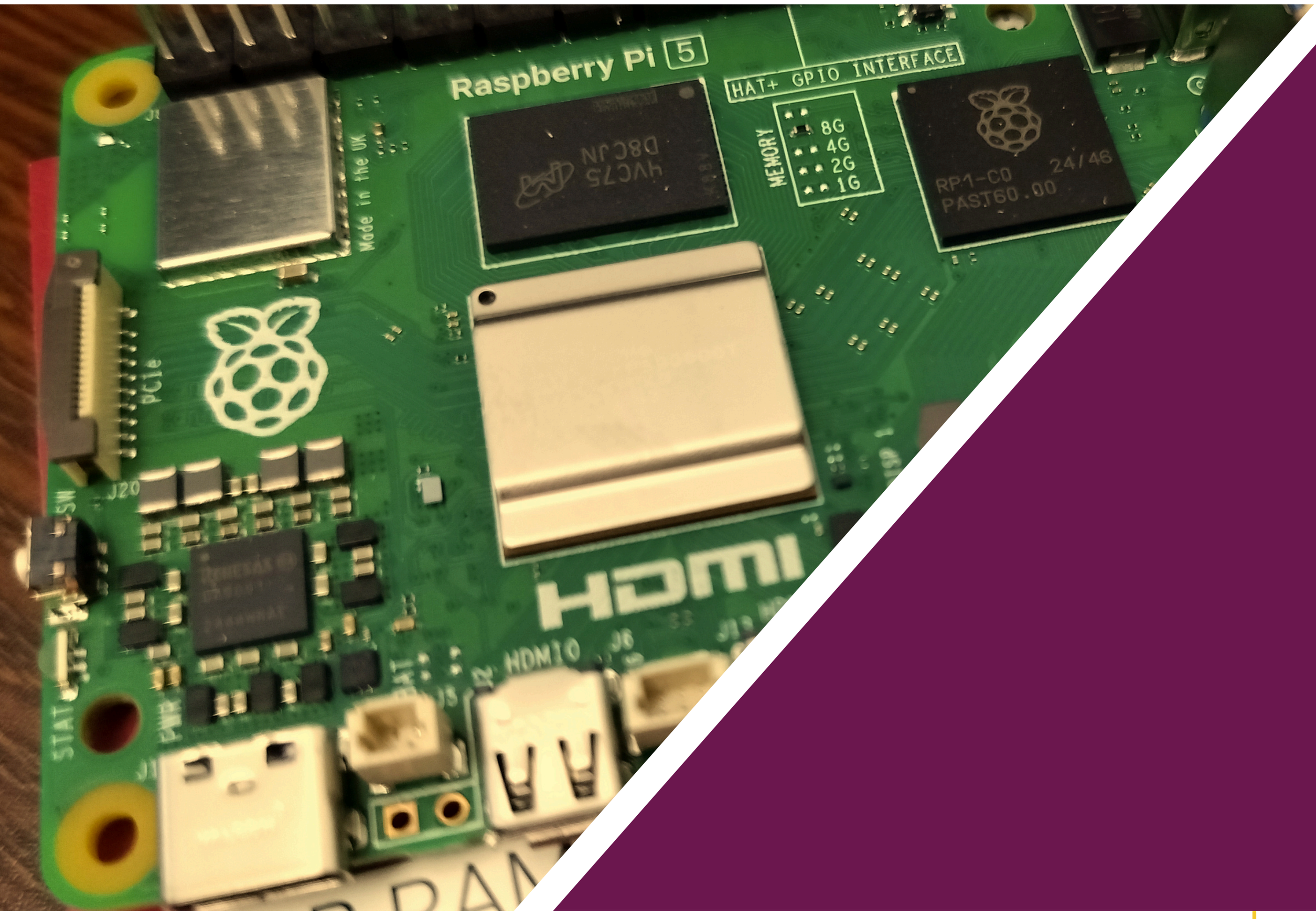
UNIVERSITI TEKNOLOGI MARA

EESEE 2025

10TH ELECTRICAL ELECTRONICS SYSTEMS ENGINEERING EXHIBITION 2025

VOLUME 1



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UNIVERSITI TEKNOLOGI MARA
JOHOR BRANCH
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FOREWORD BY THE PROGRAM CHAIR

Greetings from the Electrical, Electronics, and Systems Engineering Exhibition 2025 (EESEE 2025).

As the Program Chairs, it is our great pleasure to present this compilation of extended abstracts, showcasing the remarkable projects developed by our final-semester students from the Diploma in Electrical Engineering (Power) and Diploma in Electrical Engineering (Electronics) programs at Universiti Teknologi MARA, Cawangan Johor, Pasir Gudang Campus.

This exhibition marks a significant milestone in our students' academic journey, representing the culmination of years of dedication, perseverance, and learning. It also serves as an essential step toward the successful completion of their diploma studies. The projects featured this year are centered on the theme *Engineering Excellence: Bridging Technology and Life*, reflecting current trends and innovations in the engineering field.

This extended abstract book highlights not only the students' technical expertise but also their creativity, problem-solving skills, and ability to engage meaningfully with peers and industry professionals. Within these pages, you will find a diverse range of projects that embody a unique blend of knowledge, innovation, and practical application.

We warmly invite you to explore this collection, which celebrates the achievements of our aspiring engineers. Welcome once again to the Electrical, Electronics, and Systems Engineering Exhibition 2025. May the insights shared here inspire and pave the way for the next generation of innovative engineers.

Warm regards,

Dr. Fatimah Khairiah binti Abd Hamid
Dr. Atiqah Hamizah binti Mohd Nordin
Program Chairs
Electrical, Electronics, and Systems Engineering Exhibition 2025 (EESEE 2025)

Home Automation with Monitoring System Using ESP8266 and Blynk for Energy Conservation Measure

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ABSTRACT

This project, "Home Automation with Monitoring System Using ESP8266 and Blynk for Energy Conservation Measure," tackles the need for energy-efficient homes by integrating IoT technology to automate and monitor appliances. The ESP8266 microprocessor controls the system's sensors, which include the PMS5003 for air quality monitoring, the DHT22 for temperature and humidity, the LDR for detect light, and an ultrasonic sensor for manual system on/off. The technology ensures a healthier and more efficient living environment by optimizing energy usage, cutting expenses, and improving indoor air quality through the collection of real-time data. The Blynk app, which is accessible on PCs and smartphones, allows users to remotely schedule, monitor, and control appliances, providing flexibility, convenience, and control even while they are not at home. Relays and LCDs are essential parts that allow for smooth device control and status updates, guaranteeing the system's dependability and efficiency. This integrated solution is a useful and effective strategy for contemporary, energy-conscious households looking to lessen their environmental impact because it reduces energy waste, promotes sustainable living habits, and improves user comfort.

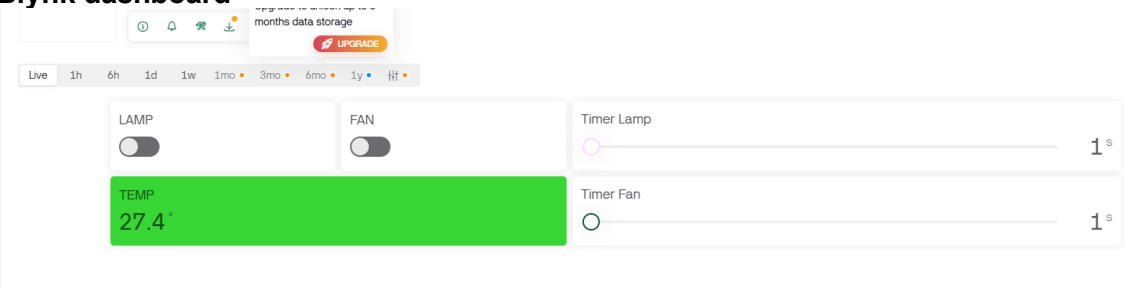
KEYWORDS: real-time data, energy optimization, IoT technology.

PRODUCT DESCRIPTION

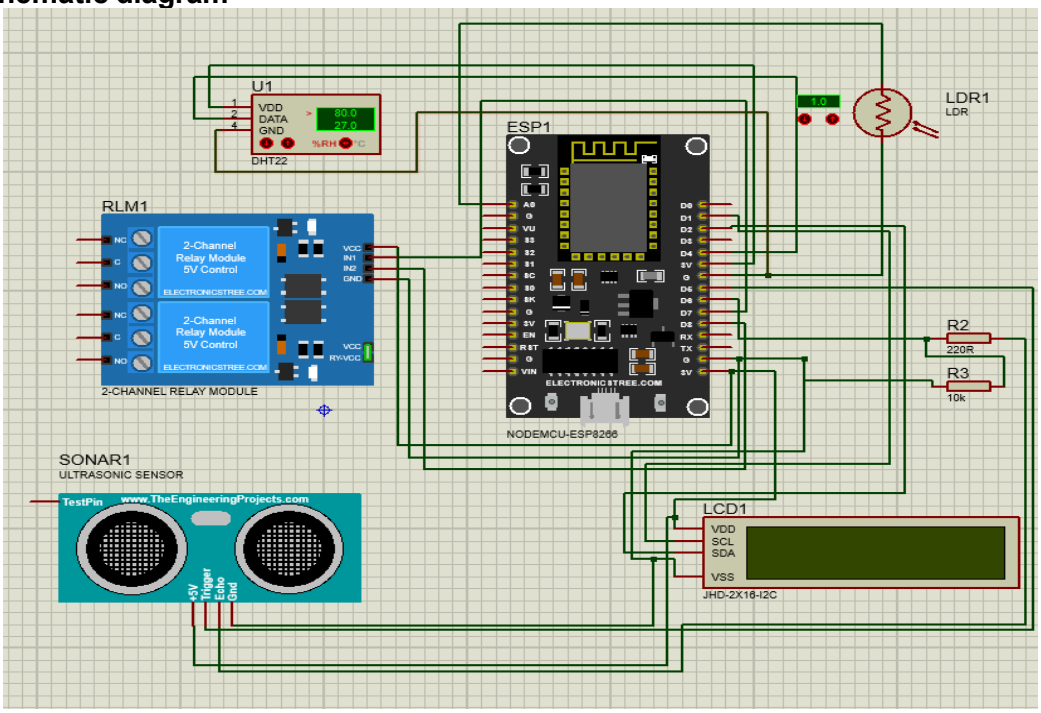
The Home Automation with Monitoring System, powered by the ESP8266 microcontroller and IoT technology, is a creative approach to smart living and energy conservation. This system reduces energy waste by automating and monitoring household appliances in real time [Singh, S., Matharu, H., & Mishra, S. (2017). Internet of things (IoT) based home automation system. International Journal of Engineering Sciences & Research Technology, 6, 239–244]. It does this by integrating high-precision sensors such the DHT22 for temperature, the LDR for light intensity, the PMS5003 for air quality, and an ultrasonic sensor for system on/off. It provides smooth device scheduling and remote control via the intuitive Blynk app, which is available on PCs and smartphones. Relays and OLED screens are used in this system, which was designed with ease and sustainability in mind. The ESP8266 guarantees dependable data transfer and intelligent automation. This system encourages economical living and establishes a new benchmark for environmentally friendly smart home technology by providing adaptive energy-saving modes, real-time notifications, and effective appliance control.

PICTURES/ SCHEMATIC DIAGRAMS/ FLOW CHARTS/SCREENSHOTS/ GRAPHS AND OTHER RELATED VISUALS

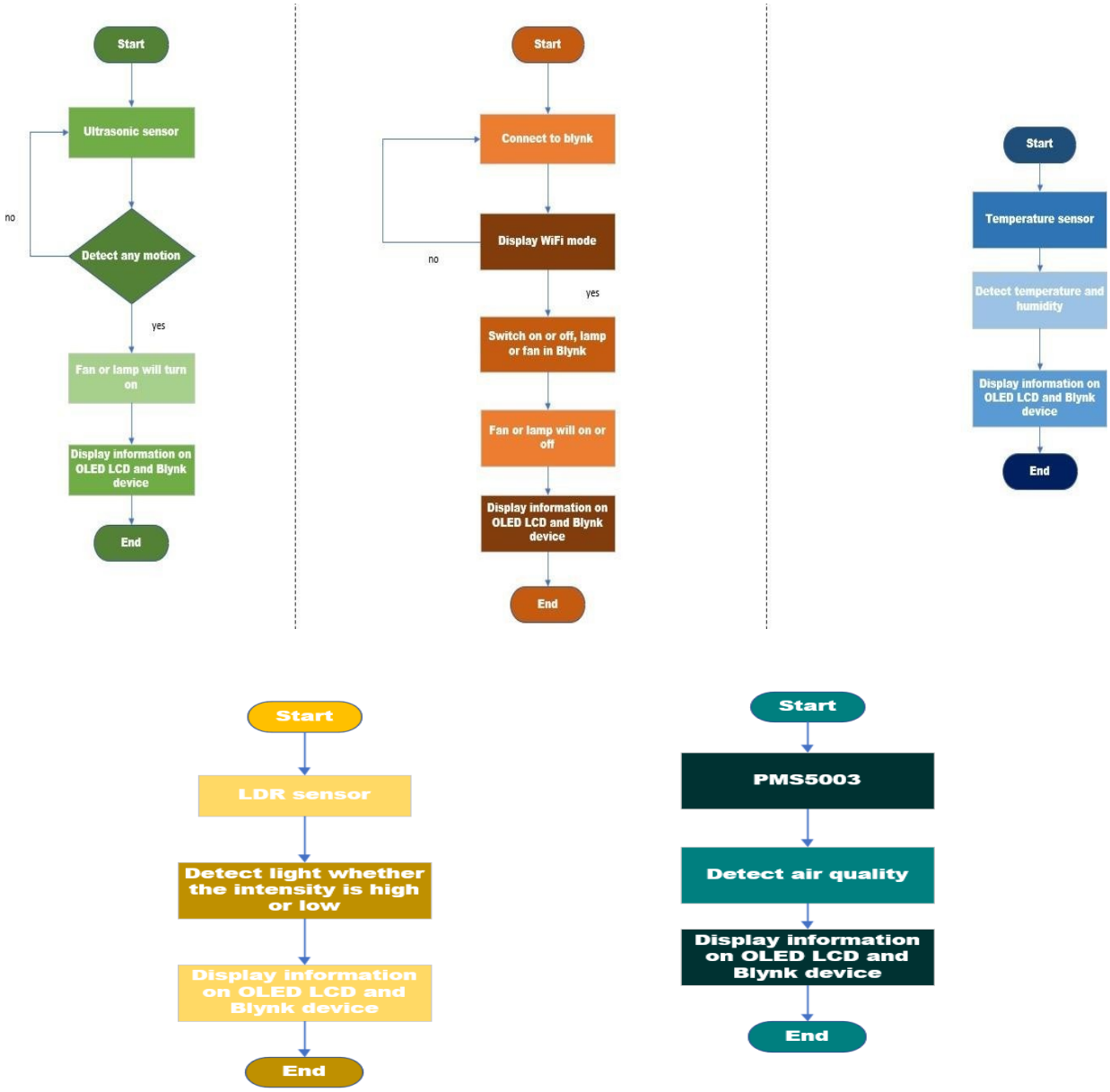
1. Blynk dashboard



2. Schematic diagram



3. Flowchart



NOVELTY AND UNIQUENESS

The novelty and uniqueness of the Home Automation with Monitoring System lie in its seamless integration of IoT technology with advanced energy conservation measures, making it a complete answer to contemporary living. In contrast to traditional systems, this project uses sensors such as DHT22, LDR, and Ultrasonic in conjunction with the ESP8266 microcontroller to allow for remote control, adaptive automation, and real-time monitoring via the Blynk application. It differs from other smart home technologies in that it can dynamically modify appliance usage based on environmental conditions. It also has user-friendly features like scheduling and real-time notifications. Its emphasis on sustainability, scalability, and affordability also guarantees wide accessibility and adaptability, meeting a range of demands in both residential and commercial applications. This system's unique contribution to smarter and more environmentally friendly living options is highlighted by its creative approach to energy management.

BENEFIT TO MANKIND

The Home Automation with Monitoring System promotes energy efficiency in homes and ecological living, which helps humanity greatly. The solution lowers needless energy use, which lowers utility bills and lessens the carbon footprint of contemporary homes by utilising IoT technology and real-time monitoring. Its remote appliance automation and control feature promotes greater independence and improves convenience, especially for the elderly and those with mobility issues. Additionally, by promoting sensible energy consumption and lowering greenhouse gas emissions, the system helps to protect the environment. In addition to enhancing quality of life, this system's incorporation of smart technology aids international initiatives for resource conservation and sustainability.

COMMERCIALIZATION POTENTIAL

The Home Automation with Monitoring System has significant commercialization potential in the growing smart home market driven by rising consumer demand for sustainable and energy-efficient living options. It appeals to tech-savvy homes due to its combination of Internet of Things technology and user-friendly features including remote control, real-time monitoring, and adjustable energy-saving modes. It can also be widely adopted in both residential and business settings because to its affordability and scalability. This system has the potential to reach a number of market niches, such as luxury residences, rental properties, and environmentally concerned consumers, thanks to its capacity to adapt functionalities to user needs. Its market attractiveness is further increased by its alignment with global sustainability goals, which makes it a viable solution for collaborations with energy firms, IoT developers, and merchants of smart homes.

CONCLUSION

In conclusion, the Home Automation with Monitoring System shows how Internet of Things technology can transform smart living and energy management. The ESP8266 microcontroller and sophisticated sensors work together to efficiently manage and monitor home appliances, reducing energy waste, cutting expenses, and improving convenience. Its user-friendly design, remote control capabilities, and real-time monitoring make it the perfect tool for encouraging economical and sustainable energy use in contemporary houses. By lowering carbon footprints and encouraging users to adopt more energy-conscious behaviours, the system promotes wider environmental and economic objectives in addition to its immediate advantages. An important step towards smarter, greener living spaces has been taken with this creative approach.

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