UNIVERSITI TEKNOLOGI MARA SARAWAK

FINAL YEAR PROJECT REPORT

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IoT BASED HOME AUTOMATION SYSTEM

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ABSTRACT

The IoT Based Home Automation System presents a comprehensive solution for remote monitoring and control of home appliances using Internet of Things (IoT) technologies. This project aims to enhance convenience, efficiency, and security in households by integrating various sensors, microcontrollers, and communication protocols. Through the implementation of ESP32 microcontroller, along with sensors such as LDR, DHT11, and IR, the system enables real-time monitoring of environmental parameters like light intensity, temperature, and motion detection. The Blynk platform facilitates remote control and monitoring via a user-friendly mobile application. The project encompasses several phases, including breadboard circuit testing, PCB layout design, and prototype development. Challenges such as soldering issues and component malfunctions were encountered during the testing phase, underscoring the importance of thorough quality assurance procedures. Recommendations for future enhancements include refining PCB design, exploring additional sensors for enhanced functionality, and optimizing user interface for improved usability. Overall, the IoT Based Home Automation System demonstrates the potential of IoT technologies to revolutionize home automation, providing users with greater convenience, efficiency, and peace of mind.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Home automation systems have revolutionized the way we interact with our living spaces, bringing a new level of convenience, efficiency, and security to modern homes. The roots of home automation can be traced back to the early 20th century, where the concept of automating household tasks and functions began to take shape.

In the early days, home automation was primarily focused on simple tasks such as turning lights on and off or controlling the temperature of a room. These systems were often rudimentary and relied on basic mechanical timers or switches.

However, with the advent of computer technology and the proliferation of modern electronics, the evolution of home automation accelerated rapidly. In the 1960s, pioneers like Seymour B. London began to explore the possibilities of automated systems for monitoring and controlling various aspects of the home environment.

London's groundbreaking work in automated blood pressure monitoring paved the way for more sophisticated health monitoring systems. His invention of the first automated blood pressure machine in 1965 marked a significant milestone in the development of home health monitoring technology. By automating the process of measuring blood pressure, London's device made it easier and more efficient for healthcare professionals to monitor their patients' vital signs.

Similarly, advancements in heart rate monitoring technology have also played a crucial role in the evolution of home health monitoring systems. Early devices like the electrocardiograph were bulky and expensive, limiting their accessibility to the general public. However, with advancements in miniaturization and sensor technology, heart rate monitors have become smaller, more affordable, and more widely available.

CHAPTER 2

LITERATURE REVIEW

1.1 INTRODUCTION

The utilization of IoT-based home automation systems has become increasingly prevalent in healthcare settings, offering innovative solutions for remote patient monitoring and environmental control. Within this framework, the selection and integration of appropriate sensors are critical to ensuring the efficacy and reliability of such systems. This literature review focuses on examining the key roles of DHT11, IR, and LDR sensors within IoT-based home automation systems, elucidating their functionalities, capabilities, and contributions to enhancing healthcare outcomes.

The DHT11 sensor, renowned for its affordability and simplicity, serves as a fundamental component for monitoring temperature and humidity levels within the home environment. With its compact design and digital output, the DHT11 sensor provides real-time measurements of temperature and humidity, facilitating the assessment of indoor air quality and comfort levels. Despite its relatively modest accuracy and limited temperature range, the DHT11 sensor offers a cost-effective solution for basic environmental monitoring applications, enabling users to maintain optimal living conditions conducive to health and well-being.

In tandem with the DHT11 sensor, the integration of an infrared (IR) sensor adds another layer of functionality to IoT-based home automation systems, particularly in the realm of motion detection and occupancy sensing. By detecting changes in infrared radiation emitted by objects within its field of view, the IR sensor enables the detection of human presence and movement, thereby facilitating automated lighting control, security surveillance, and energy conservation. With its rapid response time and low power consumption, the IR sensor enhances the overall efficiency and responsiveness