ABSTRACT

This research is based on the need for an effective security system to protect student dormitories from potential dangers, such as theft when the dormitory is quiet or students smoking in the dormitory. This research aims to design and implement a security monitoring tool for student dormitories. The method used is the development of a prototype-based system with the main components using the HC-SR501 PIR Sensor, MQ-2 sensor, ESP32 CAM, Arduino-based Fingerprint Sensor, and Telegram. This system is designed to monitor student dormitories and provide warnings if there are suspicious movements when the dormitory is quiet or identify students who enter the dormitory. This research will involve 10 samples of people as test subjects. Data collection was carried out through direct observation and system testing. The data collected includes the results of movement detection, student identification, and system reliability testing. The test results show that the system can work well, capable of 100% detecting suspicious movements, gas, and cigarette smoke effectively. The system is also 100% capable of identifying students' fingerprints in normal circumstances and 30% in the case of dirty/wet fingers. The fingerprint sensor response is fast and even. -average response time of 2.27 seconds. This system has the potential to improve dormitory security and provide early warning to supervisors via the Telegram application. So this research can contribute to the development of security systems in educational environments and increase awareness of the importance of security for student dormitories in Islamic boarding schools.

Keywords: *Security monitoring tool, PIR Sensor, MQ-2 Sensor, ESP32 CAM, Fingerprint Sensor, Telegram, Boarding school, Student dormitory.*