ABSTRACT

Home security is crucial to protect residents from the threat of theft. Conventional security systems, such as mechanical locks, are often easily bypassed and thus ineffective. This study aims to design a home door security system based on the Internet of Things (IoT) using a fingerprint sensor as the primary authentication method. The system utilizes the NodeMCU ESP32 as the main controller, which is connected to the fingerprint sensor to read and verify users' fingerprints. Additionally, the system sends real-time notifications to the Telegram app whenever there is activity at the door, whether the access is successful or failed. The test results show that the system can recognize registered 21 fingerprints with 100% accuracy. Notifications are sent to Telegram with an average time of 7.46 seconds for registered fingerprints and 5.80 seconds for unregistered ones. If an unregistered fingerprint is detected, the system activates a buzzer as a warning alarm. With this system, residents can receive early notifications, enhancing home security and effectively preventing theft attempts.

Keywords: *Buzzer, NodeMCU ESP32, Fingerprint Sensor, Telegram*