ABSTRACT

Fingerprint implementation can be used for various problems, especially those related to security and security. Some examples of fingerprint implementations that have been carried out include others are for room security, employee attendance, document security, vehicle security, and smart home security. Fingerprint implementation can improve security and efficiency in various aspects, such as increasing employee discipline, limiting document misuse, and strengthening smart home security systems.

MQTT is a messaging protocol that can be used for M2M (Machine to Machine) communication, and is a lightweight protocol that consumes minimal power. Fingerprint implementation with Home Assistant can be done using ESP32 which is connected to the Raspi (Raspberry Pi) via the MQTT protocol, and retrieve fingerprint data from the fingerprint sensor. The fingerprint sensor can register new fingerprints and delete old fingerprints IDE remotely without reprogramming.[1]

The test results show that this system can facilitate residents' access without the need for physical keys or PIN codes. The system successfully identifies and validates registered users with an accuracy rate of 98%. The QoS (Quality of Service) test shows an average delay of 2.53 seconds, average throughput of 38.66 KB/s, and an average packet loss of 0.99%. The MQTT communication between the ESP32 and Home Assistant requires an average latency of less than 3 seconds. The relay successfully locks the door when the fingerprint is recognized by the system.

Keywords: Fingerprint, MQTT, Raspi, ESP32, Home Assistant.