

ABSTRACT

Security is one of the factors that need to be maintained within a scope, be it a house, office building, or other privacy space. Security can be disrupted by threats in the form of loss of valuables to violence. This phenomenon became the author's Final Project idea to propose the development of a security system in the form of a fingerprint sensor, Radio Frequency Identification (RFID), IoT based panic button through a user application that is connected to the NodeMCU ESP8266 and Firebase as a real-time database. The system is equipped with a Passive Infra-red (PIR) sensor for an alert feature to support security around the door. The security system can be an alternative in overcoming the weakness of conventional locks.

In system testing, the system function test is carried out with the distance from the fingerprint sensor and RFID sensor using e-KTP. In testing the quality of data transmission on the panic button, alert, and open/close features in the smartdoors application, Quality of Service (QoS) measurements are carried out consisting of throughput, delay, packet loss, and jitter. Parameter testing was carried out 30 times.

From the test results on the RFID sensor, it shows that the optimal distance to detect e-KTP is 3.5 cm. While the fingerprint sensor does not have an optimal distance because the fingerprint can only be read by sticking it directly. QoS performance based on THIPON standardization on the alert feature of the PIR sensor produces an average throughput value of 29,622 bps, a packet loss percentage of 0.15%, a delay value of 68.90 ms, and a jitter result of 68.24 ms. The open and close features have an average throughput value of 42,156 bps, a packet loss percentage of 0.05%, a delay value of 48.57 ms, and a jitter result of 47.78 ms. The panic button feature has an average throughput value of 44,795 bps, a packet loss percentage of 0.06%, a delay value of 37.33 ms, and a jitter result of 36.56 ms.

Keywords: E-KTP, Internet of Things, NodeMCU ESP8266, Radio Frequency Identification, PIR Sensor, Fingerprint sensor, Panic button, Quality of Service.