ABSTRACT

The high crime rate, particularly in safe neighborhoods, has driven the development of IoT-based safety box devices. With this in mind, a security system is necessary when opening a safe, one option being the use of the Safety Box With Fingerprint. A safety box serves as a storage place for goods that can be utilized in public areas. By utilizing safety boxes, the public will feel more secure when storing their valuables.

Safety Box With Fingerprint is a prototype of a safe that can be accessed using fingerprints. In addition to the use of a fingerprint sensor, this tool is equipped with several hardware devices such as 2x16 LCD, 4x4 keypad, SW18010p vibration sensor, ESP 32, buzzer, solenoid, relay, power supply, and step down module. With the implementation of IoT in this safety box system, it can guarantee the security of the safe because the status of the box can be monitored directly on the mobile app. The mobile app can also display break-in status data with a fingerprint sensor that will detect an incorrect fingerprint and also due to a vibration sensor that will activate a buzzer when there is a shock.

Qualitative and quantitative tests were carried out to test the feasibility of the product that the author made. Qualitative testing included testing the performance of the fingerprint sensor in reading the user's fingerprint, the ability of the fingerprint sensor to store the user's fingerprint, the ability of the vibration sensor to detect vibrations or shakes, and application testing in monitoring sensor work with fingerprint and vibration sensors. Quantitative testing includes conducting user experience surveys and performing QoS calculations. According to the test results, the fingerprint sensor can detect the user's fingerprints in 1.74 seconds. The fingerprint sensor can store the user's fingerprints by opening the solenoid lock. When the user accesses the fingerprint, the vibration sensor can detect shocks, and the buzzer will make a sound. Application testing is carried out using the blackbox testing method. Quantitative test results include survey results, which were obtained 51% using the NPS method; QoS results include throughput calculations with an average value of 28.8 kbps and a delay of 43.84 ms.

Keywords: Safety Box, Safe, IoT, Fingerprint, Security