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INNOVATION

Smart Door Lock Design Using RFID And Face Recognition Based On Internet Of Things Case Study: UPI Electronics Lab Campus in Purwakarta

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Research Background

- The number of crimes involving house and building burglaries has continued to increase in recent years
- Burglary cases can also occur in the UPI Electronics Lab Campus in Purwakarta
- Burglary cases occur because the majority still use conventional doors
- The need for modern technology to monitor access to a room

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Previous Relevant Research

RANCANG BANGUN DOORLOCK SYSTEM DENGAN RFID
MENGGUNAKAN ARDUINO

IMRAN ZAKI
NPM : 16630416

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Universitas Islam Kalimantan
Muhammad Arsyad Albanjari
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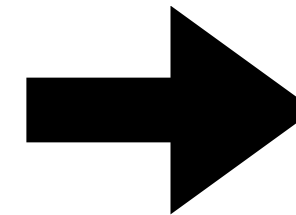
Based on the research, the results obtained were that the RFID detection time was 2-3 seconds while the sensor detected at a distance of 5 cm.

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Problem Statement

- How is the design of a Smart Door Lock system utilizing RFID technology and face recognition based on the Internet of Things in the UPI Electronics Lab, Purwakarta Campus?
- How is the implementation and analysis of the test results of the Smart Door Lock system using RFID and face recognition based on the Internet of Things in the UPI Electronics Lab, Purwakarta Campus?

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Research Methods

This research uses the R&D Waterfall approach method, where in this research a system that has been created previously is developed and then redeveloped with updates using the flow in the diagram on the right.
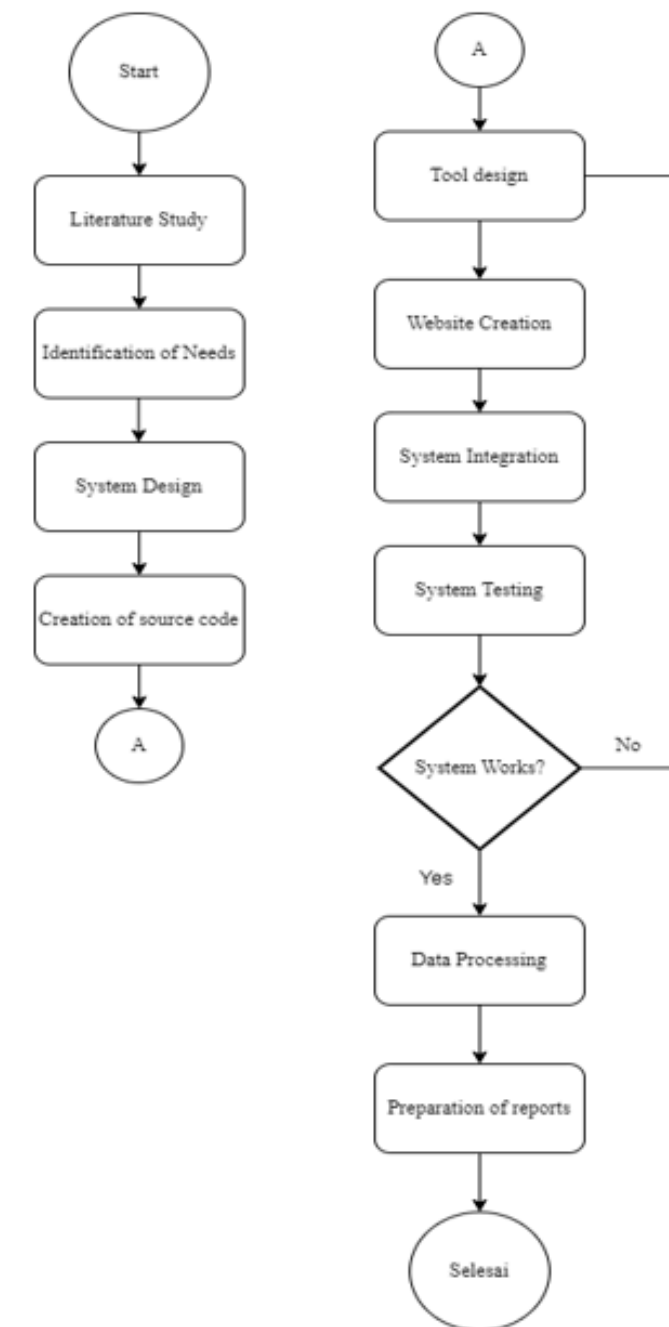
Data Collection Technique

a. Accuracy test

The accuracy test in this study aims to assess how well the RFID system can read the NUID value and face recognition can recognize the registered face. The experiment can be said to be accurate if the system succeeds in verifying RFID data and face recognition. This test uses the following formula:

$$Accuracy = \frac{Number\ of\ successful\ attempts}{Total\ attempts} \times 100\%$$

b. Time test

The time test in this study aims to determine how much time is needed to access the RFID and face recognition system. In addition, this test is carried out to determine the average time needed to access the system that has been created using the following formula:
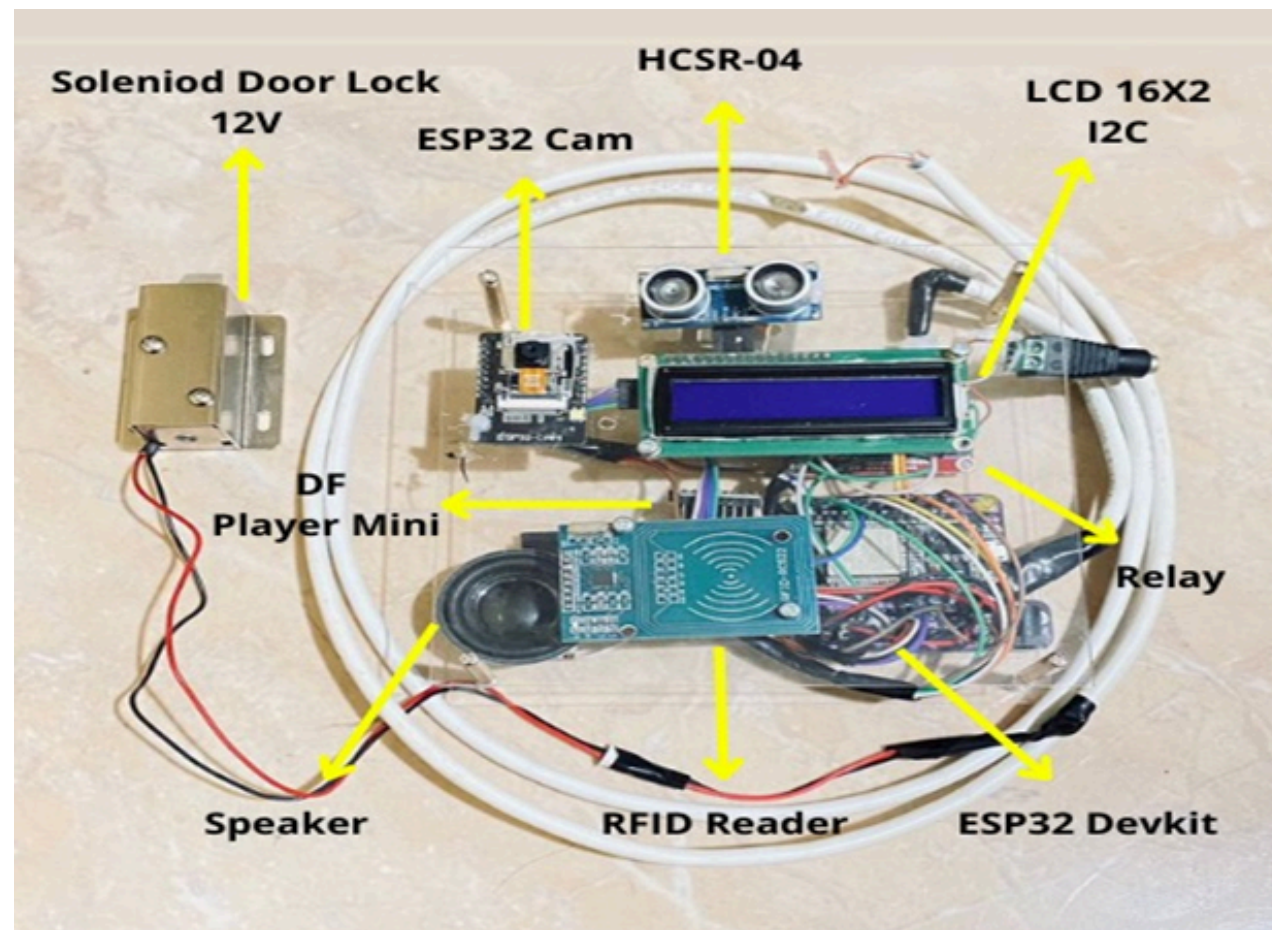
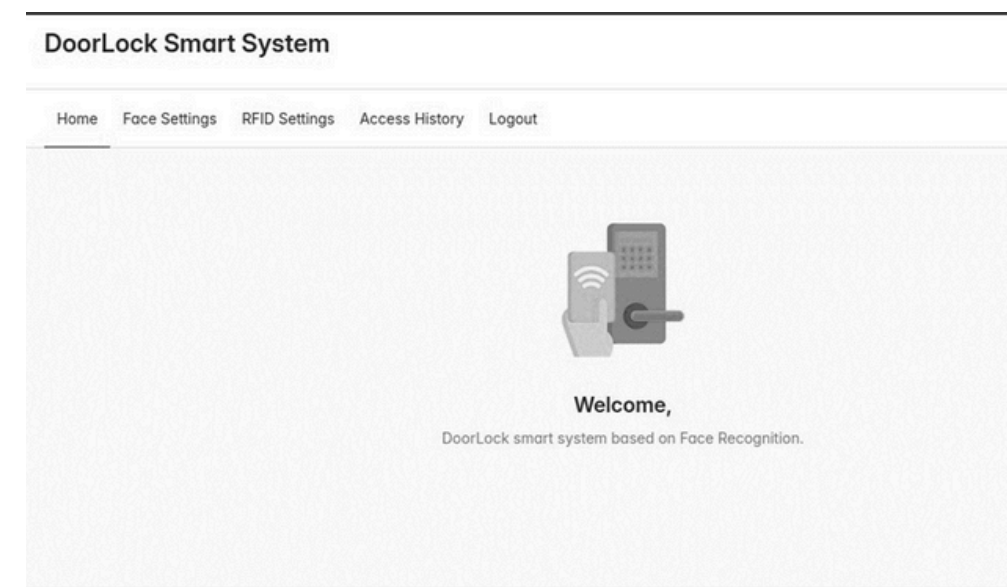$$Average\ time = \frac{Total\ time}{Total\ attempts}$$

Data Analysis Techniques

The test data results obtained through the 2 previous test scenarios will be analyzed by comparing the work results of the two systems.

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Software & Hardware Design Results

HARDWARE

SOFTWARE

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Analysis of Results

RFID			Face Recognition		
Accuracy	Total time	Average time	Accuracy	Total time	Average time
100%	106,77 sec	3,56 sec	100%	143,92 sec	4,8 sec

Conclusion

The Smart Door Lock system using RFID and Face Recognition was successfully built according to the design that had been made. This system has also been successfully integrated with the website and telegram platforms so that it helps users to monitor the system online. Based on the results of the tests that have been carried out, access using RFID has a faster response than access using Face Recognition, although both still function as expected.

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Thank You

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