

CHAPTER 4

DESIGN ANALYSIS

4.1 Analysis

This chapter will explain how the security system that has been created works. After opening the login page, the user needs to enter an ID and password. If the ID and password are correct, the process will continue to verification using an RFID card. When the card is already scanned, the system will check whether the card is correct or not for that user and if the key card is correct then it will enter to the main site of the web.

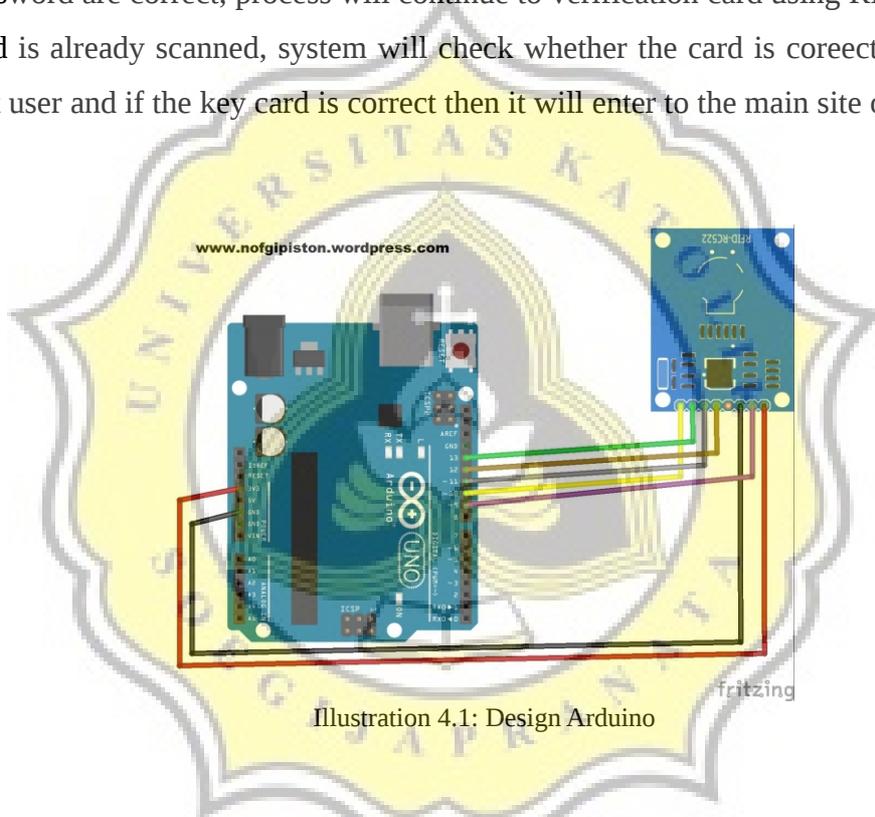


Illustration 4.1: Design Arduino

This project uses an Arduino Wemos D1 board. The Arduino design is as follows:

1. RST pin RFID to pin D9 Arduino
2. SDA pin RFID to pin D10 Arduino
3. MOSI pin RFID to pin D11 Arduino
4. MISO pin RFID to pin D12 Arduino
5. SCK pin RFID to pin D13 Arduino

6. 3,3v pin RFID to pin 3,3v arduino
7. GND pin RFID to pin GND arduino
8. Leave IRQ pin not connect anywhere

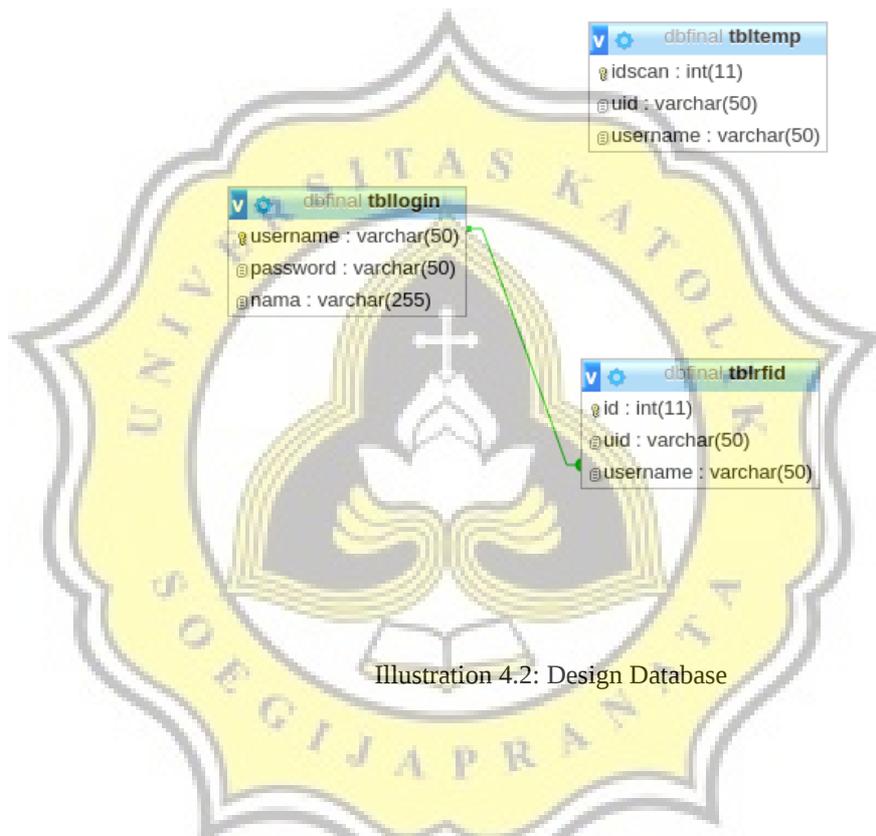


Illustration 4.2: Design Database

This project use database design as shown above. This database design have 3 tables such as `tblrfid`, `tbllogin`, and `tbltemp`.

`Tbllogin` used to store user's basic data , for example username, password and nama. Username contain unique id for user, in password contain the password that created by user, and nama contain the user's real name.

`Tblrfid` used to store user's id and rfid data that will be used as key for user. Username variable is related to the username variable that is in the `tbllogin`.

Tbltemp only used temporarily to store rfid's uid and username for verification when login is on process

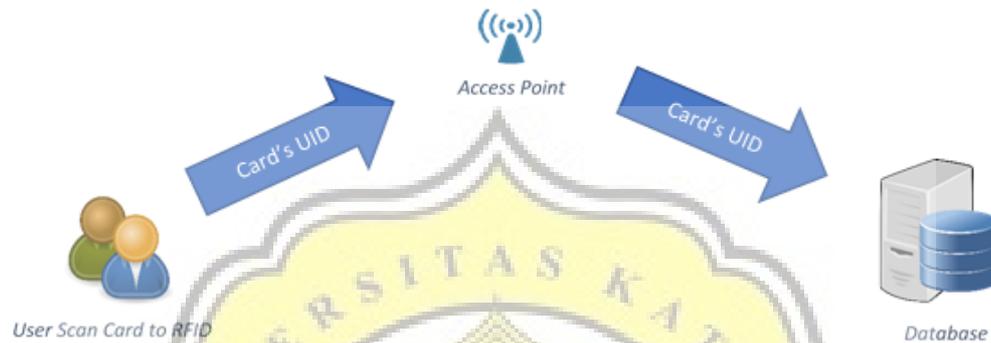


Illustration 4.3: Process Flow

The picture above show the main process flow of this security system. It start from user scan the key card to RFID. After that, the data that rfid read will be envrypted using caesar cipher method first after that it will be sent to access point. It need an access point so the data from rfid can be stored to database and can be used for verification. After the data from RFID is sent to access point, it will be decrypted, after that then the data will be sent to database server,

The login form consists of three main components: a text input field for 'User ID', a text input field for 'Password', and a 'Submit' button. The form is enclosed in a blue border.

Illustration 4.4: Login Form

The login form contains 2 field for user id and password. After fill the id and password there is a button for continue to card verification page.

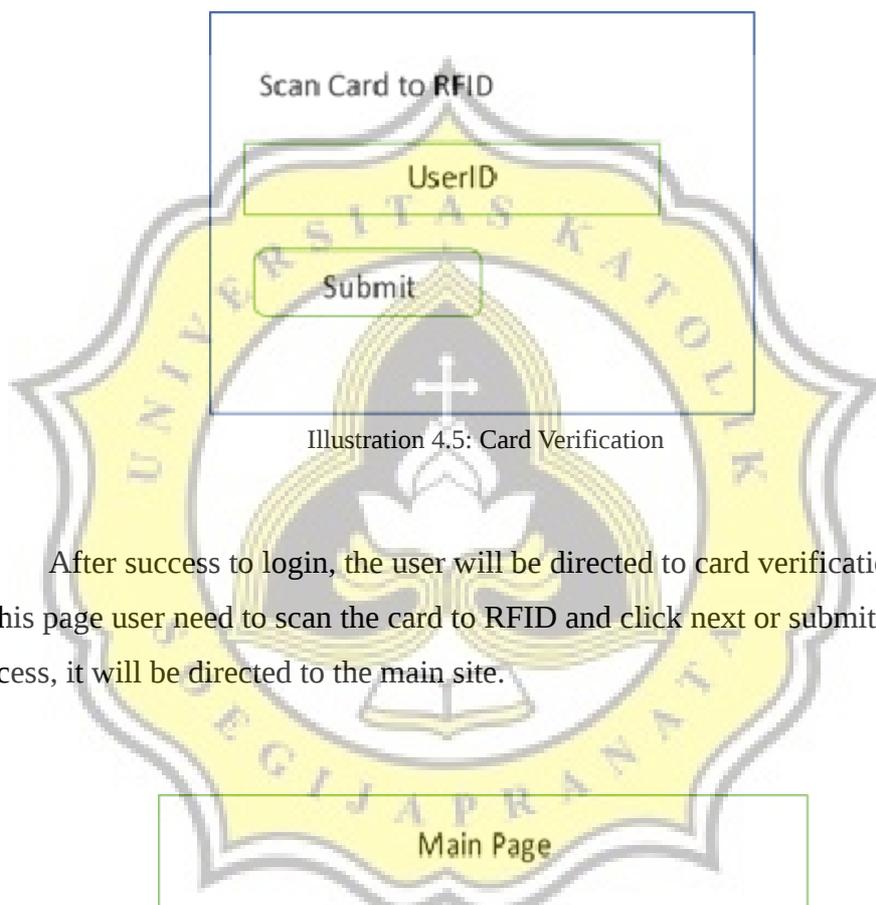


Illustration 4.5: Card Verification

After success to login, the user will be directed to card verification page. In this page user need to scan the card to RFID and click next or submit button. If success, it will be directed to the main site.

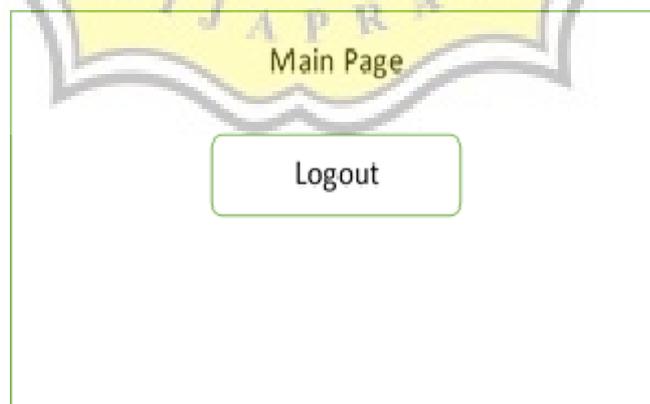


Illustration 4.6: Main Page

After all component that need for login is correct, then user will be directed to main page. In this page there is a logout button to end the session.



```

27.   cipher = char(cipher);
28.   cipher2=cipher;
29.   pass2=cipher2;
30.
31.   pass3 = char(buffer2[3]);
32.   pass3.toCharArray(temp,20);
33.   cipher = ((temp[0] + kunci - 'a') % 26) + 'a';
34.   cipher = char(cipher);
35.   cipher2=cipher;
36.   pass3=cipher2;

37.   pass4 = char(buffer2[4]);
38.   pass4.toCharArray(temp,20);
39.   cipher = ((temp[0] + kunci - 'a') % 26) + 'a';
40.   cipher = char(cipher);
41.   cipher2=cipher;
42.   pass4=cipher2;

43.   pass5 = char(buffer2[5]);
44.   pass5.toCharArray(temp,20);
45.   cipher = ((temp[0] + kunci - 'a') % 26) + 'a';
46.   cipher = char(cipher);
47.   cipher2=cipher;
48.   pass5=cipher2;

```

On the first line is command to print text password. Line 2 until line 6 is to declare variables that will be used for read data and encrypt data. Line 7 until line 9 to declare variable that will be used to store the data that ready by RFID. Line 10 until line 48 is to read the data that ready by the arduino and store it to variables. It also encrypt each character.