Development of Intelligent RFID Based Security System For Automated Teller Machine

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Abstract- The main objective of this project is to upgrade the security of the current ATM (Automated Teller Machine) system. In this project RFID reader and the RFID Tag technique is used. And linking the RFID Tag of the client into the bank's database as to additionally verify it. By assisting and matching RFID Tag, furthermore with the generation of OTP to the client's mobile through SMS it must have to be entered by the clients to start the ATM system. Also the addition of components such as IR sensor and the metal sensor helps to strengthen the security of the system. If any individual trying to enter the system without authentication or carrying any metal devices to harm the client, by giving security voice commands such as illegal entry and metal detected through the speaker module. And immediately terminating the ATM transaction. Also giving an alert SMS to the local police station, bank authority and to the bank account holder. It gives the second level of security.

Keywords- GSM, ALCD, RFID, RL78 microcontroller, OTP, IR sensor, Proximity sensor, FN16Mp3 speaker module.

I. INTRODUCTION

Security1has1always1been1a1major1concern1and1securing1the1integrity1of1it1is1the111majorgoal11of1allorganization. When discussing ATM machines the part that most worried about is Physical security which goes for guaranteeing Access control, Identification and Authentication. Access control is another thought of Information System security to affirm the only authorized entity is accessible to the system with the advancement of banking technology the method for managing an account has changed. On one hand where it has freed us from remaining in long lines to do money withdrawal, on the other it has increased the dangers of robbery. ATM (Automated Teller Machine) has turned out to be a simple and advantageous approach to do all our banking tasks in only couple of minutes.

An ATM card or debit card confirms individual, after confirmation of card number, Expiry date, card holders name and the PIN. In any case, what in the event that when the card is stolen, or PIN is known to an unapproved individual. For it requires higher level of security which coined up an idea of adding OTP and RFID to the current technology. RFID has developed as a measure for exceedingly secure identity and individual authentication. There can be a chances that sometime a person needs to withdraw amount, behind him is a long queue. In such situation if he fails to type OTP generated at predefined time just to debit a little cash, other people has to wait for long time and upon it time consumption is simply irritating and causes much delay than needed. To skip this problem setting up time limit constraints for one person entry for the transaction. This time out process helps to allow next person for his amount transaction.

It also1guarantees1security as1each ATM has1its cash limit1and bank1hasitstransaction limit. So1in case of card1misuse, this1embedded system1developed will1prevent withdrawal1of large1cash. Large1 amount1transaction is secured1by the use of RFID technique and1 the one time1password generation method. Individual must have to enter the OTP before entering to the system. Thus1this technique helps to limit1the maximum amount1that can be withdrawn by unauthorized person. Along with this even securing the ATM machine itself from fraud attacks by using Metal sensor and IR Sensor.

## II. BLOCKDIAGRAM
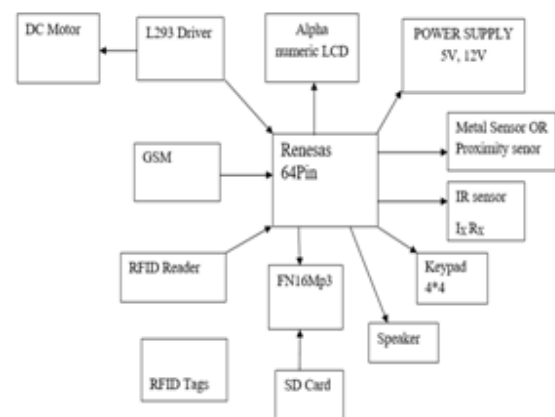
III. BLOCK DIAGRAM DESCRIPTION

1. Renesas Microcontroller:

In this project Reneses microcontroller used to connect all other components of the project. The main advantage of Renesas microcontroller over other microcontrollers ishas total 3 UART and availability of Total 11 ports with 58 Input/output Pins helps to connect all the necessary components.

2. LCD

In this project to display specific information commands this LCD is used.Fig4.2: Shows the LCD display. This1LCD1has116 columns1and12 rows.1So that1it1can display116 characters1in each row.
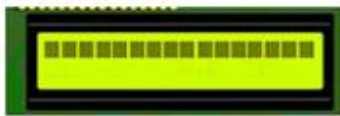
3. GSM

Earlier GSM called as Group special mobile and the GSM is called as Global System for Mobile Communications. In this project GSM is used to send OTP or SMS purpose.


4. DC MOTOR

In this project 12 volts DC motor is used for opening and closing of the door of security system.Motor is driven by the L293 motor driver in forward and the backward direction.

5. L293 Motor Driver

The bidirectional Control of motor is achieved by This1L2931Motor1Driver.1This1L2931it1isa1synchronized1circuit1motor1driver.in1fact1the1L293 can only handle lower currents such as 600Ma it has its limitations
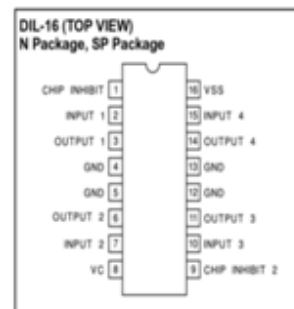

6. The RFID Reader:

RFID stands for Radio-frequency identification. It is an automatic detection technique, which uses RFID tags. This technique two important components RFID reader1and1the1RFIDTag.

7. Proximity sensor

This is also called as metal sensor or proximity which has the capability to identify the nearby objects without any physical touch. To get return signal and to detect any changes in the signal this metal sensor produce electrostatic
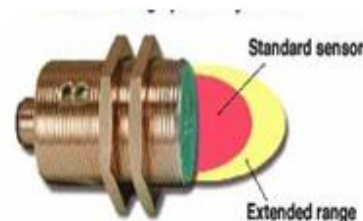
8.   IR Transmitter and Receiver sensor

Infrared Obstacle Sensor Module has built in receiver and transmitter of IR sensor. That propels Infrared energy and then looks for the s reflected Infrared light energy to spot any object near the IR sensor.

9.   FN-M16P MP3 Audio Module

FNM16P is the well-integrated and having a WMV decoder chip MP3 module which is used for the voice output function in this project.

10. Matrix Membrane Keypad (4x4)

In this project matrix membrane keypad is used to the enter the OTP generated by the GSM Module

IV. METHODOLOGY

The1project presents the RFID1system1in 1automated1teller machine.1The entrance1will1be approved essentially1by methods for1the RFID1verification. A man, before going into ATM must confirm with their RFID label whether he was having authorization or not, the owner will receive an OTP through an SMS, Owner must enter the OTP to get into the ATM. When confirmation done then ATM entryway door   opens. On the off chance that the individual attempting to go into ATM without checking RFID1Tag the alert unit will be on, It gives second level security.

RENESAS 64 pin microcontroller acts as the heart of the project to which all other components are connected as shown in the block diagram. Initially user need to tap the RFID card by then it scans personally-linked information of the user which is then verified with the stored database. Later an OTP is sent to the user's mobile through GSM Module. OTP is entered through keypad. As soon as the door opens a person enters the room then IR sensor detects the headcounts, if the count is more than 1 buzzer beeps along with it message will be sent to the administrator. Metal sensor is used to detect metal objects, if the entered person carries any metal objects buzzer beeps. Stepper motor interfaced with the microcontroller is used to drive the opening and closing of the door. During this process whenever buzzer beeps display will turn-off restricting further transaction

V. CONCLUSION

This project1is developed1on the1basis of1more need1of1security1in1ATM   banking1system. Now-a-day's1ATM1is1getting1less1secure1with1emerging1ways1to hack/crack1ATM1PIN or1ATM1card. The1ATM user's cash1transaction is1secured by adding1the RFID reader, Tag and OTP to the existing system. The individual with the RFID tag can tap the tag along with individual must have to type the OTP generated to enter the door and to stats the system. This constraints helps to improve the safer transaction of1clients.1Along1with1this1ATM1system11is1alsosecured1from1the1fraudattacks1by1using1the1Metalsensor1and1IR1Sensor.1if any unauthorized person1try1enter1the1system and even carrying any metal objects thus immediately process gets terminated and security voice commands given by the speaker module. This ensures safety of the both ATM machine and the clients. So it has been able to prove that the RFID based ATM is practicable and could be implemented in the security of ATM systems

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