Highly Secure Multiple Account Bank Affinity Card-A Successor For ATM Card

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***Abstract*— Present day, ATM system provides the facility to access any ATM card in any ATM system to a user. The problem with the present ATM system is that if an user has more than one account, he has to carry all the ATM cards associated in his account to access multiple bank accounts and also has to remember multiple passwords. In this paper we are introducing an application for banking purpose particularly for ATM card. Here we are integrating multiple bank accounts into a single ATM card. In this cryptographic era, passwords represent the weakest link in the computer security chain. So, we are introducing fingerprint based authentication and face recognition which provides high security. SMS based OTP(One Time Password) is also used to prevent fraud and to avoid PIN (Personal Identification Number) which provides higher security. In addition to user friendly and reliable banking procedure, the proposed method also reduces the cost of interbanking transactions as interbanking different bank data bases is a resource consuming thing.**

Keywords—ATM, PIN, Multi banking, Fingerprint, User behaviour, Card authentication.

I. INTRODUCTION

ATM is an electronic device which provides the user to perform transactions without the need of cashier, bank teller. ATM servicess are popular because of their easiness for banking systems. In modern ATMs ,the customer account can be identified by inserting a plastic card with magnetic strip that contains his or her account number.The customer then verifies his or her identityby entering a passcode(i.e.)personal identification number(PIN) of four digits.If the number is entered incorrectly sevaral times consequently(usually thre,most ATMs will retain the card as security precaution to prevent an authorized user from assuming the PIN by guesswork and so on.Moreover the customer has to pay transaction fees.By keeping all burdens aside ,a novel aaproach bank affinity card been proposed in this project.In the proposed system, the person with the card needs to swipe the card first and then ATM ask for the fingerprint authentication. If the fingerprint matches with the card details, then it will ask for the face recognition.If the face is recognised, the ATM will provide all the bank accounts linked to the same number from which a person can select any one.Upon bank selection, the cash transaction can be done. Both the bank selection and cash transaction procedure in the proposed system is authenticated based One Time Password (OTP) which will be sent to the registered mobile number. An RFID tag is used as a smart ATM card, it is considered as an exciting and fast growing technology. It improves the multibanking and transaction is easier.

II. LITERATURE SURVEY

The design of an embedded system is used for the ATM security in the paper "Secured ATM Transaction System Using Micro Controller"[1].The UART mode of communication was used to scan the data base of the card holder and it automatically generates the message to a register mobile number through a GSM module[2].

Vibration Detection Sensor was used in the paper "Anti-Theft ATM Machine".They used RFID, GSM and micro controller in this system[3]. In the "Finger Print Based Authentication System"they used fingerprint module, micro controller,buzzer[4]. With biometric features like fingerprint Babaei et al. presented a method of using face recognition for ATM users[5].

To increase the reliability of ATM transactions Aru et al. proposed an ATM security model which combines physical acccess card, a PIN and face recognition[6]. In most of the approaches mobile devicess are introduced. They have the capability of reading RFID tag and they also provides higher computing performance.

A. Existing System:

In the present system firstly, the user has to insert his card into the ATM systems card slot. User has to enter the PIN of four digits for that particular card in the next immaediate step for the purpose of authentication. If the PIN is entered incorrectly more than three times that particular card will be blocked for some time. If the PIN is verified user can select particular transaction which he wants and he can also enquire balance by selecting Balance Enquiry Option, it provides printed slip of the details. He can also deposit amount by selecting deposit option, then the amount will be added to that percular account to which he wants to send money. User can withdraw money by selecting withdrawl option, then requested amount will be

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drawn from the cash dispenser. If the entered amount is less than 100 or more than the limit It will display that enter valid amount.

B. Drawbacks:

1. User has to carry more ATM cards for more bank accounts.
2. There is no OTP based technology
3. When transaction is done from different ATMs user has to pay extra charges.
4. User has to remember PINs for all ATM cards.
5. There is no fingerprint and theft detection.
6. PIN is the weakest link in the existing system.

III. PROPOSED SYSTEM

In the proposed system we have Aurdino Mega, RFID Tag, RF Reader, RS232, Fingerprint scanner, LCD display, Keypad, GSM modem, Relay, Motor, Buzzer and Camera. RFID tag is used as a smart ATM card for transaction. A user can operate all his different bank accouts using a single card instead of carrying multiple cards and rememebering PINs. Fingerprint, Face recognition and SMS Fig1:Multiple accounts display

A. Advantages:

1. User can carry a single ATM card for all different accounts.
2. Enhanced security sytem.
3. It generates OTP to the registered mobile number.
4. It is user friendly.

B. Methodology

In the proposed multiaccount bank affinity card system,the autonomous actions are attained by employing Arduino.The Arduino is the central core part in this system.the Arduino has multiple features which enables all the security concerned application for the ATM card issues. The RF ID reader,finger print sensor,GSM module and keypad are the key modules interfaced with the Arduino.

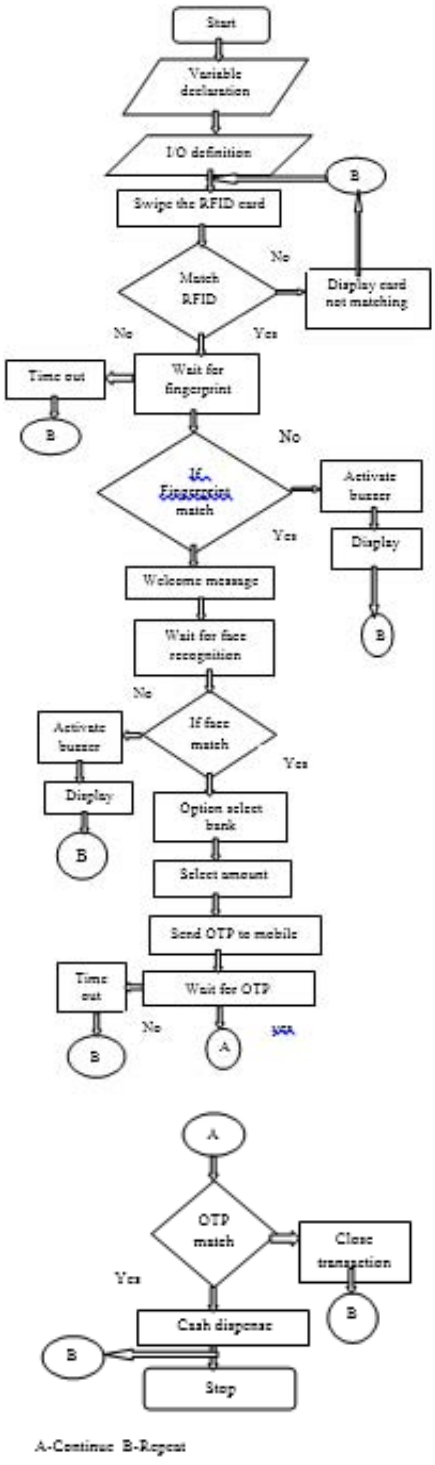
When the customer swipes RF ID card on the card reader,the system will ask for fingerprint authentication to identify the card holder. When the customer place finger on the scanner,it will match the fingerprint with the database to identifiy authentication and give signal to arduino.The arduino process the signal and alerts the card owner with SMS in case of unmatched finger print found and produce a warning sound with the help of buzzer.If the finger print is matched with the database,then arduino identifies the registered user then it will check the face if the face is matches with the database then it will send the OTP to the mobile number registered by the user.The Arduino will ask user to enter the OTP send to mobile in order to proceed the transaction. Once the OTP is entered and verified by arduino,it will give option to select bank account that user want to make transaction and to proceed with the transaction. After selecting the bank,if the user want to make cash transaction the same OTP procedure is followed.The OTP in the system is sent to the mobile number registered by the card holder.In this proposed system GSM module is used to provide SMS services. Moreover,for OTP authentication,the user needs to enter the received passcode within default time limit.If not,the transaction will be cancelled and the user needs to repeat the same.

IV. BLOCK DIAGRAM

ARDUINO 2560: It consists of both software and development board. Operating voltage of arduino is 5v and the input voltage is 7-12v. It has 54 digital input or output pins and 4 UARTs(hardware serial ports). Power for arduino can be supplied externally or via USB connection. Controller used is ATMega 2560.

RF ID TAG AND READER: The RF ID read write module is used for storing and transferring the user details through radio waves..For example if the user is having 4 different bank accounts this card contains all the account numbers with customer name and identity.There is a RF ID card reader in the system which is used to read information from the card. RF ID unique tag will be given with specific code to each user,depending upon the code customer is identified.The information from the RF ID reader is sent to Arduino via RS232.

FLOWCHART



A-Continue B-Repeat

Fig2:RFID TAG

RS232: RS232 is introduced for serial communication transmission of data.It is also used for connection in modems,printers and other peripheral devices.In this paper the data from RF ID reader will be transmitted to Arduino through RS232.This is placed connection is between Arduino and finger print scanner,GSM modem,USB cable.The data get transferred between this modules from the Arduino via radio waves.

LCD DISPLAY: LCD display is used. This displays the message for example customer details,enter the amount,enter the OTP etc.The control pins of LCD are register select,read write and enable pin.The register select is used to select the register specifically as command or data register.If you want to send data to display we need to give high at RS pin and if we want to give commands to LCD display then we need to give low at RS pins.Since we are writing into LCD from arduino mega the value of RW pin is always low.In considered to Enable pin,it serves as toggle for input acceptance at LCD side.Whenever we want to send anything to LCD,thease control pins need to be sent in the software.In absense of such pins,the LCD wont respond back for the commands or it wont display the data which are published from controller.For both the control and data,LCD have only 8 pins in common(D0-D7).Since we are using the include library itself provides all the foresaid things in connection with LCD display

. **GSM:** In our project, we used UART mode of communication for interfacing GSM with Arduino mega.Baud rate of 9600 is utilized for communication purpose between arduino and GSM. The default baud rate of GSM is 9600.The possibility of GSM baudrate value is 9600*N and the value of N can be from 1 to 12.The GSM respond to any connected device only when the client sends AT commands.AT stands for Attention.Receiver and Transmitter pins of the GSM needs to be connected to Arduino.In the GSM program we are using following commands for sending message.They are Attention,Command message format(CMGF),Command message sends(CMGS),and message.After sending every command we need to press enter and linefeed for the accptance at recepient side.Upon successful reception of AT commands at GSM,it will respond with OK.

NUMERIC KEYPAD: In our project,the keypad library is utilized for interfacing keypad with arduino.In the code you

need to configure,the array format of keypad ie number of rows,coloumns,rowpins(pins on to which row of keypad is connected) and column pins(pins on to which column is connected).In our demo code,the keypad consists of 4*4 matrix.In the program,we need to configure the pin status of row and coumn pin of keypad.After successful completion,create a keymap using predefined inputs.

POWER SUPPLY UNIT: Power supply plays a major role in smooth running of a connected circuit. Power supply is used to supply the stabilized power to the circuit.5 and 12 volts power supply is required to make arduino mega work and relay to activate.

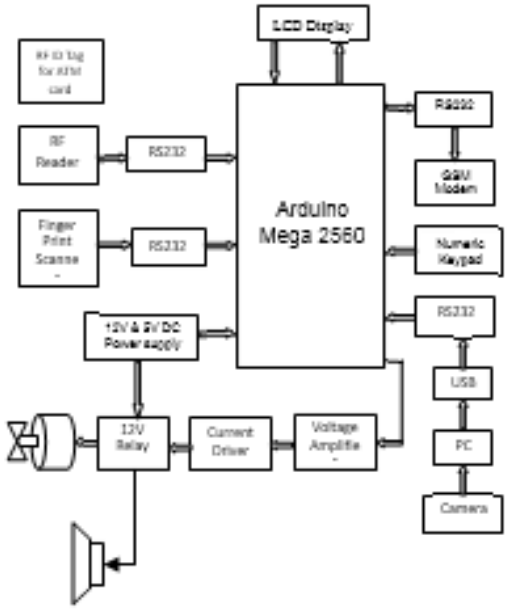
It consists of fout stages:

I. Stepdown Transformer.

II. Rectifier stage.

III. Filtering stage

IV. Voltage Regulation Stage.



FINGERPRINT SCANNER: Fingerprints are distinctive and persistent, every person has different fingerprints. It is basically consists of crests and furrows that form a unique pattern. At the time of authentication fingerprint scanner scans the user's fingerprint and extracts unique features which are compared to previously stored database.It is used to match the finger prints of a user given while creating a bank account

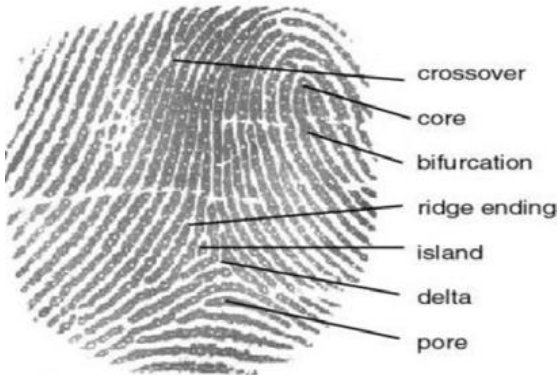


Fig3: Fingerprint scanner

CAMERA: To recognize or verify a person, a camera with facial recognition software is an efficient solution.

BUZZER: A buzzer is a mechanical or piezoelectric device which generates audio signal. Typical use of buzzer include alarm device, timers etc.It is used for a warning sound when there is a mismatch of finger print or if face is unknown and if OTP is typed incorrectly.

RELAY: A relay is an automatic switch.We use 5pin relay which consists of two coil pins ,one common pin,normal close and normal open pins.Controller or Arduino Mega decides to activate or deactivate relay.The output of arduino mega is 3.5 to 5 volts.Relay requires high current and voltage,so driver circuit is required to activate relay.It is also used to activate either motor or buzzer.

VOLTAGE AMPLIFIER: It is used to amplify the voltage level coming from arduino mega as relay requires high voltage to activate.

CURRENT AMPLIFIER: It is used for amplification of current and drop voltage which is required to operate relay.

I. FUTURE SCOPE

Since more bank accounts are added the existing security is not enough, so Iris recognition and vein pattern recognition can be added to the existing ATM system in the future.

II. RESULTS

In this project we successfully recognised face and finger print of user for multiple accounts and received OTP to registered mobile number.

III. CONCLUSION

Thus with a help of single ATM card user can manage his different accounts of various banks which provide simple access and lessens the transaction charges. It also reduces the complications of maintaining more ATM cards .In this project, OTP based system provides more security for customers. The system is more convinient because there is no need of memorizing all the PINs. Finger print authentication and Face recognition provides high security which prevents ATM fraud.

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