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A Secure Smart Card for Multiple Bank Accounts

[1]G.Deepika,[2*]K. Dhana Laxmi, [3]K. Manohar,[4]V.Chanakya

[1]Assistant Professor, Department of Electronics and Communication Engineering, St. Peter's Engineering College, Hyderabad, Telangana, India

[2,3,4]UG Student, Department of Electronics and Communication Engineering, St. Peter's Engineering College, Hyderabad, Telangana, India

ABSTRACT : Automated teller machine services are most popular, because of their flexibility in the banking sector. Nowadays people are using ATM cards for instant moneytransfers,withdrawals,ministatements,and deposits. According to the presentscenario, most customers havemultiple bank accounts as they need to carry those multiple cards and for authentication must remember their PINs. To overcome these kind of problems, in our proposed systemmultiple bank accounts are embedded in a single RFID card [1]. So that customers can easily carry the transactions from multiple bank accounts.Their Fingerprint authentication is enabled to provide the high-security, if the given fingerprint recognized by the machine.So that it allows to display of multiple bank accounts on the LCD, then selected bank transactions can be performed by the customer [2]. It will help forthose who are maintaining multiple bank accounts in the society.

 KEYWORDS: Banks,RFIDcard,Fingerprint,Authentication,Transaction.

I.INTRODUCTION

Automated Teller Machine shortened as an ATM.It is a telecommunication device that provides quick financial transactions to the users instead of without an external person in the public.ATMs arecommonly knownsuchasAutomatedBanking Machine, Automated TransactionMachineand Any Time Money by different placesall over the world [3]. Nowadays, most of the people have ATM cards for financial transactions and generally, the users are identified- inserting the smart card in the ATM which contains magnetic strips and unique information.The identity of the customer is verified by PIN authentication.The information about the pin and password may not be secured as they were easily known by others when we paste the informationon a paper for fear of forgetting [4]. Money from the holder can be easily stolen or hacked by unknown which results in great suffering to the user. The ATMs can be accessed by the user from differentplaces any instant oftime as these machines are located in different places. Moneycanbewithdrawn by the customer based on the authenticationasPIN(PersonalIdentification Number) or password and OTPwhich is insecure [5]. To provide better security to the userbiometric technique like fingerprint is enabled for authentication methodsin ATMs.Data can be made more secure for users by their characteristics likefingerprint.The customers have identifiedaccurately with the biometric information which avoids the hackers to overcome the threats of looting them. Using biometrics, identifiersoffers benefits overtraditional and current methods [6].The physical cards are stolenorduplicated, even the passwords can be shared as fear of forgetting which makes the user risk their money from their account.Themain pillarsof the biometric features are identification and verification which canbe easily accessible and helps to enhance security [7].Inthesemodern days, customers have individual ATM cards for every bank to maintain their accounts. So, handling the cards and remembering their passwordsis difficult in today's trade [8]. To overcome these issues, we are designing a single smart card with multiple bank accounts. So,that the customers can easilyaccess and perform transactions from multiple bank accounts throughsmartcards. In this system,the purpose of RFID is to identify and verify the system effectivelyby transmitting the radiowaves.With the growing technology, for performing banking operations noone wants to stand and wait for a long time in queues [9].Thusmanypeopleareusing ATMsfor their needs in life, which leads to the development of the banking sector.

LITERATURE SURVEY

1. G.Manoharbabu, Anil Kumar:Theseauthorshad presented the idea of multiple bank accountsembeddedina single smart card. So that the customers can operatemultiple bank accounts with a smart and secured single card.While the user swipes the card in the ATM,then immediately requests OTP on theserver-side [10].Then customer receives the OTP

from the registered mobile number which is generated by ATM. Through this OTP authentication,the usercan perform the transactions in the ATM.

2. Apeksha BM,PrarthanaMB,Dechamma Pavan c: These authors give an overview of designing a single smart card with multiple bank accounts.Hereeachuser isprovided with an individual card and number for their respective bank accounts.To perform the transactions user always swipes the card, for authentication,it asks to enter the PIN of 4 digits,ifthe entered PIN matched with the registered PIN. Thus,ATM processes the transactions, which are intimated to the user through the GSM module.

3. Nagaratna,B. Sree, Ravikiran,F. Kouser:These aboveauthorshadintroducedthe Highly Secured Affinitycard to multiple banks.They have integrated multiple bank accountsinto a single card.They have included authenticationas OTP. Based on that transactions are carried out in the ATMs.

4. Arpita v naik, Soniya R Naik, Nehananaiah, Sheral paul: These authors have discussedthe model ofmultiple accountsthat arebeing unified in a single ATM card,where each user hasan individual cardandunique account number. Here users use the OTP as the verification part.Since OTPs are the valid specific duration of time that are generated by the ATMs. If the entered OTP is valid with the register number then the transactions are carried out by the users.

5. P. H. Kale and K. K. Jajulwar: These authors have implemented the design of theATM Card securitywith TwoFactorAuthentication.To enhance the security they include the authentication factor asOTP and the PIN.After verifying the identification of the user, transactions are enabled by the ATM.

6. S. Gokul, S. Kukan, K. Meenakshi, S. S. V. Priyan, J. R. Gini, and M. E. Harikumar: These authors had been worked on a smart ATM using RFID based on thebiometrics. In this work, every user has an individual ATM card for their bank accounts and it works based on the RFID and thebiometrics of the user [11]. After obtaining the detailsof RFID and biometrics from theuser it iscompared with database details. Then a message will be sent to the corresponding account holder about whether their status is valid or not. If valid transactions are carried by the user in the ATM.

III.A SECURE SMART CARD FOR MULTIPLE BANK ACCOUNTS

Thecurrent banking systemrequires a slight change in the implementation of ATMs [12].The main idea of this model is that customers have individual ATM cardsfor theirrespective bank accounts. According to the presentscenariosmaintaining the PINs andcarrying the cards is a complicated process for the users, which are embedded in the single smart card.The customer can beableto operate multiple bank accounts easilythrough a smart card instead of multiple cards.This smart card reader is used as RFID, which is a fast-growing technology. RFID can read multiple Tags at once which leads to an increase in the efficiency of barcode technology. Here user scans the Tag on the reader, thengivesthe fingerprint. If the given fingerprintisthe same as the registered data, then ATMs are enabled to display multiple bank accounts on the LCD [13].After selecting the bank the request is received from the corresponding bankfor accessing the database through the network, which is linked with the bank sever. Such that transactionsare processed by the ATM [14].
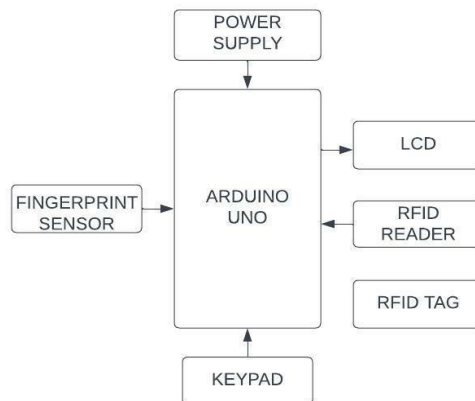

Figure 1: Block diagram of A Secure Smartcard for Multiple Bank Accounts

The Block diagram consists of

- Arduino UNO
- Fingerprint sensor
- Power supply
- Keypad
- RFID Reader
- LCD(Liquid Crystal Display)

A magnetic strip-based ATM is used as an RFID, which has unique information. The data from the sensor is processed by using an Arduino UNO microcontroller. The user registers the bank details that are stored in a database, based on the withdrawal of the amount from the ATM instead of multiple cards. This system provides a securesmart cardto operate multiple banks instead of multiple cards. An input to the circuit is given as a power supply(+5v) [15]. Arduino UNO stores the data simultaneously which is given to the system and it acts as a microcontroller. RFID tags act as smart cardsconsisting of fixed 12-digitnumbers and are unique for each card. The RFIDtag is read by the RFID reader which is connected to the microcontroller through serialcommunication.The keypad is connected to the microcontroller which is input to the microcontroller. Authentication of the user is verified by the fingerprint sensor. After the verification, the system displays the multiple banks on the LCD screen, then the transactions are further processed by the ATM.
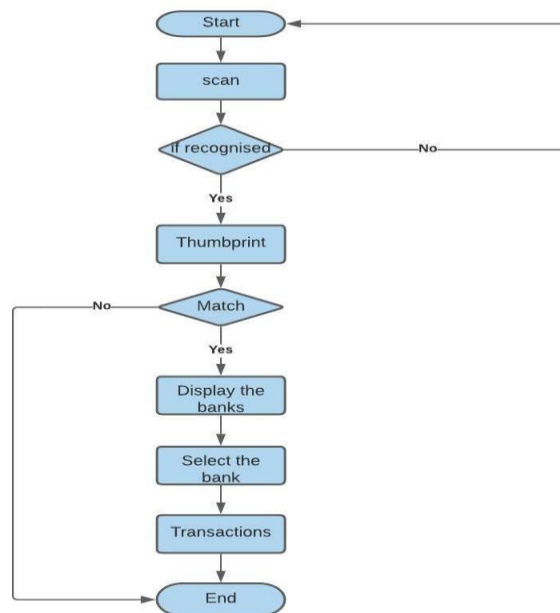

Figure 2: Flow chart of a Secure Smart card For Multiple Bank Accounts

This prototype design gives working of multiple bank accounts using a single smart card.

 Initially, the system turns on and then scans the tag on the reader. If it is recognized the system display the message as welcome to banking otherwise, the system starts from beginning.Whileauthenticating the Thumbprint to the system,the usershould scan the tag. Then the given Thumbprint matches with the registered database detailsand displays the banks.If not matched, the process will be ended. The selected bank transactions are performed by the user. After the successful transaction, the transaction process is completed.
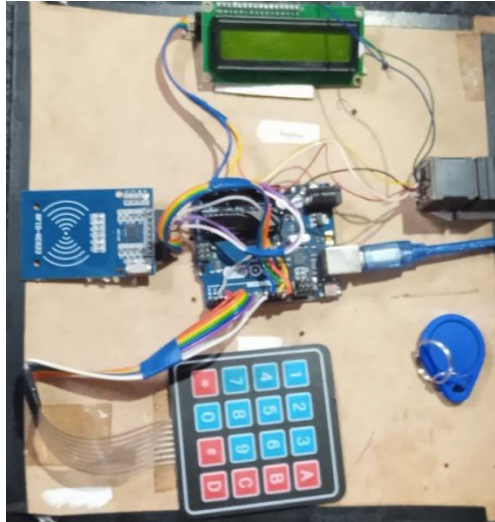
IV.RESULTS AND DISCUSSIONS

Figure 3: Hardware implementation for multiple bank accounts using a single ATM card

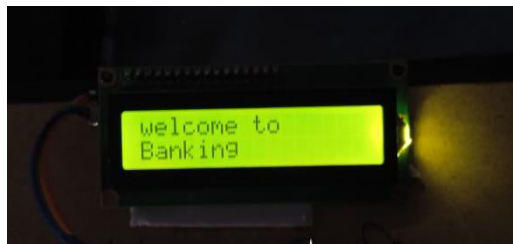The below figures represent the output of the proposed system.

Figure 4: RFID reader reads the smart card

Figure 5: Fingerprint is matched and Bank accounts are displayed on the LCD
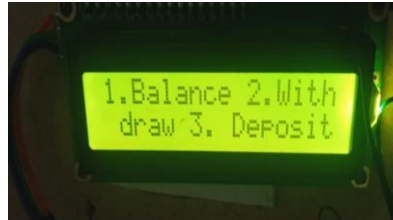

Figure 6: The selected bank is displayed

Figure 7: Menu is displayed on LCD

Figure 8: Balance is displayed

Figure 9: Amount is deposited

Figure 10: Amount Withdrawn

V.CONCLUSION

The system is designed as a smart card formultiple bank accounts. In this users can maintain multiple bank accounts with a single smart card, which provides easy access to multiple banks and reduce the transaction fee for the users. This idea helps us to reduce the complexity of handling cards and remembering the PIN, which makes the banking system more secure. By implementing biometric technology we can enhance the security of the ATMs. Using this user performs the transactions from a single ATM cardinstead of Multiple cards.

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