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DESIGNING OF SMART AND SECURE SINGLE ATM CARD FOR MULTIPLE BANK ACCOUNTS

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ABSTRACT

This project's main objective is to integrate multiple bank accounts into one single smart card. Many bank charges ATM usage fees from the customers for different transactions. At present day, every customer has an individual ATM card for each and every bank in which he/she maintains account. So, while handling the cards, many passwords are involved. In order to overcome these difficulties, we embedded more than one bank account of the user in a single ATM smart card, therefore letting the user to swipe the card so that the respective individual can select the bank from which he/she is interested to carry out transaction.

INTRODUCTION

Modern ATMs are implemented with high-security protection measures. They work under complex systems and networks to perform transactions. The data processed by ATM's are usually encrypted, but hackers can employ discreet hacking devices to hack accounts and withdraw the account's balance. Hence, to avoid such unauthorized transactions and to protect the confidentiality of the user, we raised the bars by introducing an additional security measure such as the biometrics. In the proposed method, the magnetic strip-based ATM card is replaced with RFID based card which have a unique number. The Arduino MEGA microcontroller is used to process the data from the sensor. The fingerprint module is used to authenticate the user. The user can register the bank details and also withdraw the amount from the registered bank details. Hence this system provides more secure and multiple bank account using single ATM card.

Literature survey

Venka Reddy Maram, Mirza Sajid Ali Baig, Narasappa Reddy "Advanced Security Management System for ATM's using GSM and MEMS",(IJI Tech) International Journal of innovative Technologies, ISSN 2321-8665 Vol.03,Issue.03, July-2015.

To integrate multiple bank accounts into the one single smart card. Many bank charges ATM usage fees from the customer has an individual ATM card for each and every bank in which he/she maintains account. So, while handling the cards many passwords are involved. In order to overcome these difficulties, we embedded more than one bank account of the user in a single ATM smart card, therefore letting the user to swipe the card so that the respective individual can select the bank from which he/she is interested to carry out transaction. An Automated Teller Machine (ATM) is a computerized machine that provides customers of the banks the facility of accessing their accounts for dispensing cash and to carry out

other financial and non-financial transactions without the need to visit the bank branch. ATM's were first used in London in 1967, and after 50 years, these machines were introduced nationwide. Modern ATMs are implemented with high-security protection measures. They work under complex systems and networks to perform transactions. The data processed by ATM's are usually encrypted, but hackers can employ discret hacking devices to hack accounts and withdraw the account's balance. Hence, to avoid such unauthorized transactions and to protect the confidentiality of the user, we raised the bars by introducing an additional security measure such as the biometrics. In the proposed method, the magnetic strip-based ATM card is replaced with RFID based card which have a unique number. The Arduino MEGA microcontroller is used to process the data from the sensor. The fingerprint module is used to authenticate the user. The user can register the bank details and also withdraw the amount from the registered bank details. Hence this system provides more secure and multiple bank account using single ATM card. Automated Teller Machine (ATM)'s now a days are extensively used all over the world for the withdrawal of cash. A unique card is issued for each user along with the unique code provided to him so as to the person may do all his transactions are extensively secure there is no much more security required but in countries like India it's very necessary to have a physical security to the machine. A provision to give physical security to the machine is being discussed over here in the paper presented over here. Security in ATM networks is necessary because ATM is widespread and many areas such as financial- or medicalapplications, network-administration, etc. require very sensitive handling of the transmitted data. If we look at other fields of interest. We see that ATM channels might be used for billing. Misuse of the ATM network, manipulation of transmitted data, spoofing,or repudiation would be fatal in billing accounting system. Robberies of ATM's,misusage of credit

cards of all. Our project is going to concentrate on the ATM security system. Whenever a thief enters and tries to touch an ATM forcefully. The movement will be observed by the MEMS sensor.While MEMS observe the movement it sends a request to the microcontroller. Microcontroller will automatically lock the door which is represented with the DC motor. It will produce with the help of buzzer to alert the security. And this door will be unlocked with the switch which is present outside the room

Aman Kumar, "Advance Security System for ATM", International Journal of Scientific Research Engineering & Technology (IJSRET), ISSN 2278 – 0882 Volume 4, Issue 4, April 2015.

- Nowadays ATM Machines are one of the most important and useful thing. Millions of transactions take place on regular basis, ATM not just make our daily work easy but also provide safe, efficient and better service. They help in saving our valuable time, it is better to use ATM instead of directly reaching to bank for withdrawing money which is a total waste of time and resource. So, It is important to take care of ATMs by providing security to the machine is our responsibility, protecting it from unauthorized access, tampering or any kind of robbery. Advance ATM security system is basically a way of enhancing the surveillance of ATM Machine or the ATM cabin. So, it becomes possible for public to use ATM safely. Advance ATM security system is a Node MCU ESP 8266 based project with other different sensor like IR sensor for Motion Detection, Servo Motor for closing and opening of the cabin gate, LCD display, Alarm/Buzzer for alerts and many other sensors. All these sensors combined will improve the security of ATM and make it safer to use. The project overall provides the surveillance and protect the ATM from intruders Automated teller machine (ATM) has become one of the essential services nowadays as one can withdraw cash through ATM without

even going to a bank. It was in 1987, that HSBC introduced concept of atm in India. The idea of designing and implementation of advance ATM security system project is introduced by observing our real-life incidents. In our project, IR sensors are used, which detects movement of the person entering the cabin. The Node MCU is an open-source software and hardware development enrollment. It is used to store and implement the programs or codes written in different machine understandable programming languages. This system process real-time data collected using IR sensors. Once the suspicious movement is detected, the buzzer starts producing buzzing sound and the node MCU send the tempering message to the nearby police station. For message to be displayed in police station, to display the information an LCD display is used. A servo motor is used to close and open the door immediately. Whenever more than two persons try to enter the ATM cabin at the same time, the door will automatically close.

Moturi Phalguna Satish, Bala Kishore. G , " Implementation of Bank Security System using GSM and Internet of Things", International Journal of Advanced Technology and Innovative Research, ISSN 2348–2370 Vol.09,Issue.09, August-2017.

Big data is an information asset that has attracted attention of many researchers and practitioners in many sectors. Big data analytics process the high voluminous data to make more informed business patterns. This project mainly concerns for banking, hospital, passport and ration card details integrated into a single card i.e., Smart card. For banking sector, it is used particularly for debit or ATM card for transaction of money. Users can create and get accounts from the respective banks. A user can integrate all the bank accounts from other banks in a single card with unique pin number. User can also integrate multiple users' account into a single card. Parent user can set a

withdrawal limit. Different methodologies are used for limiting the withdrawal from other users' account. The withdrawal amount from other users' account which is integrated into this card cannot be transacted without the knowledge of the concerned user. Radio Frequency Identifier [RFID] is used for user identification number for banking, passport, ration and hospital applications. On every transaction, One Time Password (OTP) will be verified for withdrawal of money and formula based authentication is used for verification of withdrawal money limitation. User behavior is monitored using the Hidden Markov Model (HMM) and the user can set up a formula based authentication by this behavior. The operators and numbers for corresponding alphabets will be generated automatically in random. User can use this smart card for getting medical reports from the hospitals and it is feasible for the users to access all the previous medical records related to the users' health. It can help the patient to get diagnosed from different hospitals by easily accessing those records from the smart card. This card can also be used in passport for registering the travel details and maintains the records of all the travel details of the user. The ration card can also be integrated into this smart card to maintain the things bought from the ration store. All details will encrypted using AES algorithm and stored. In recent trends,BigData, Business analytical and RFID technologies are used to acquire a definite business pattern from the large volume of data. Big data in general refer to the increase in the volume of data which are complex to store, analyse and process with traditional database technologies. Business Intelligence systems are used for automatic data retrieving in an intelligent pattern based on multiple data sources. The real time data can be captured better using the wireless technology such as RFID. This system is an integrated application for Banking, Hospital, Passport and Ration. In the Banking application, the user can integrate his /her accounts from multiple banks and multiple users' account can

also be integrated into a single smart card. The user must have registered accounts in the banks that are supposed to be integrated. The user can set an unique PIN number for every account that are integrated to this smart card or a single PIN number can be set for all the accounts globally. The data regarding the users account details are encrypted using the Advance Encryption Standard (AES) algorithm and are stored in a secured way.

Existing system

Implement a fingerprint sensor on the card for biometric authentication, ensuring that only the authorized cardholder can access the accounts. NFC (Near Field Communication): Enable contactless payments for enhanced convenience. Users can simply tap their card on compatible terminals for quick transactions. Use a secure microcontroller or chip that complies with international standards (e.g., EMV) to store and process sensitive data securely. Develop a mobile app that syncs with the card, allowing users to manage multiple bank accounts associated with the card, set transaction limits, and receive real-time notifications. eCVV (Dynamic Card Verification Value): Implement a dynamic CVV that changes periodically, adding an extra layer of security to online transactions. Consider integrating blockchain to enhance the security and transparency of transactions. This can also help prevent fraud and unauthorized access. Biometric Confirmation for High-Value For high-value transactions, require additional biometric confirmation through the fingerprint sensor. SMS

or App-Based Authentication: Implement 2FA for additional security. Users receive a one-time code via SMS or a dedicated authentication app to complete transactions. End-to-End Encryption: Ensure that all communication between the card, ATM, and mobile app is encrypted to prevent data interception. Allow users to freeze and unfreeze their cards through the mobile app in case the card is lost or stolen.Implement behavioral analytics to detect unusual spending patterns and flag potential fraudulent activities, triggering alerts for both the user and the bank. OTA (Over-The-Air) Updates: Provide a mechanism for over-the-air updates to ensure that the card's software and security features are up-to-date. Security Awareness Campaigns: Educate users about safe practices, such as not sharing PINs or leaving the card unattended. Compliance with Data Protection Ensure compliance with relevant data protection and privacy laws to protect user information. Instant Customer Support: Provide a dedicated helpline for users to report issues or concerns immediately.

Proposed system

In the proposed method, the magnetic strip-based ATM card is replaced with RFID based card which have a unique number. The Arduino MEGA microcontroller is used to process the data from the sensor. The user can register the bank details and also withdraw the amount from the registered bank details. Hence this system

provides more secure and multiple bank account using single ATM card. A power supply of +5V is given to the circuit as an input. Arduino mega acts as a microcontroller that simultaneously stores data given to it. The ATM card consist of a magnetic strip containing a unique 12-digit number which acts as an RFID tag. This tag is read by a passive RFID reader (here EM-18 module) which is connected to the microcontroller through serial communication (UART). A 4x4 keypad is connected to the microcontroller that acts as an input to enter the 4-digit pin. Once the authenticity of the pin is confirmed the finger print of the user is verified using an optical fingerprint reader. The money is deposited or withdrew through servo motor that rotates 180 degree if the finger print matches the biometric data. On the other hand, if the finger print does not match, the buzzer starts ringing. Finally, irrespective of success or failure of the transaction a message or call is sent to the user through GSM module (SIM800L) which is 2G based network that uses AT commands.

Block diagram
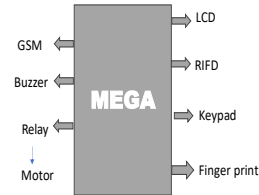
ARUDINO MEGA

Introduction to Arduino Mega 2560. It is a microcontroller board based on Atmega 2560 microcontroller. Arduino Boards have revitalized the automation industry with their easy to use platform where everyone with little or no technical background can get started with learning some basic skills to program and run the board. I have updated articles previously on Arduino Uno, Arduino Nano, and Arduino Pro Mini. All these boards function similarly in one way or the other. There are some basic features like PCB layout design, size, number of analog pins and breadboard friendly nature that make them different from each other. In terms of coding, all these boards are programmed in Arduino IDE software and you don't need to attach extra components or devices to put them in the running condition. Everything is already

built in the board that makes this device readily available. Just plug and play with the board as per your requirement. All the boards mentioned above work perfectly for a number of Arduino Projects when you require a simple task to be completed with less number of I/O pins and memory. However, when the nature of project goes complex, a board with less memory fails to complete the task. This is where Arduino Mega 2560 comes handy. This board comes with 54 pins and 16 analog pins with more memory to store the code. Sounds crazy, isn't it? Thanks to technology that keep your covered in every aspect and provides support in any way when it comes to fulfilling your technical needs. I'll try to cover each and everything related to Arduino Mega 2560, what is this about, main features, working, technical specifications and everything you need to know.

RFID READER

Active RFID and Passive RFID technologies, while often considered and evaluated together, are fundamentally distinct technologies with substantially different capabilities. In most cases, neither technology provides a complete solution for supply chain asset management applications. Rather, the most effective and complete supply chain solutions leverage the advantages of each technology and combine their use in complementary ways. This need for both technologies must be considered by RFID standards initiatives to effectively meet the requirements of the user community.

GSM (Global System for Mobile communications)

GSM (Global System for Mobile communications) is a cellular network, which means that mobile phones connect to it by searching for cells in the immediate vicinity. GSM networks operate in four different frequency ranges. Most GSM networks operate in the 900 MHz or 1800 MHz bands. Some countries in the Americas use the 850 MHz and 1900 MHz bands because the 900 and 1800 MHz frequency bands were already allocated.The rarer 400 and 450 MHz frequency bands are assigned in some countries, where these frequencies were previously used for first-generation systems.

GSM-900 uses 890–915 MHz to send information from the mobile station to the base station (uplink) and 935–960 MHz for

the other direction (downlink), providing 124 RF channels (channel numbers 1 to 124) spaced at 200 kHz. Duplex spacing of 45 MHz is used. In some countries the GSM-900 band has been extended to cover a larger frequency range. This 'extended GSM', E-GSM, uses 880–915 MHz (uplink) and 925–960 MHz (downlink), adding 50 channels (channel numbers 975 to 1023 and 0) to the original GSM-900 band. Time division multiplexing is used to allow eight full-rate or sixteen half-rate speech channels per radio frequency channel. There are eight radio timeslots (giving eight burst periods) grouped into what is called a TDMA frame. Half rate channels use alternate frames in the same timeslot. The channel data rate is 270.833 kbit/s, and the frame duration is 4.615 ms.

BUZZERS

In common parlance a Buzzer is a signaling device that is not a loudspeaker. It can be mechanical, electromechanical, or electronic (a piezo transducer). BeStar produces Buzzers in every available configuration for a wide variety of applications. A Piezo transducer can produce the sound for panel mount buzzers, household goods, medical devices and even very loud sirens. When a lower frequency is required an electromagnetic buzzer can fill the need. These are very common in automotive chimes and higher end clinical diagnostic devices. The BeStar buzzer range includes self drive units with their own drive circuitry (indicators), or external drive units, which allow the designer the flexibility to create their own sound patterns.

CONCLUSION

In this project, the user can manage his/her multiple accounts in various banks with the help of this single smart card ATM which provides easy access and reduces the complexity of managing more than one ATM card and their respective passwords. Here we provided the user with biometrics in order to create a viable method of identifying user's sufficient security level for the ATM system. The security features were enhanced largely for the stability and reliability of the owner's recognition. The whole system is built on the technology of embedded system which makes the system safe, reliable and easy to implement. Hence the vulnerabilities of the ATM fraud are reduced.

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