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"Survey of ATM Security System"

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Abstract— The main aim of this paper is to provide security for ATM Centers by using IRIS Recognition. For the traditional ATM terminal, customer recognition systems rely only on bank cards, passwords and such identity verification methods which measures are not perfect and functions are too single. For solving the bugs of traditional ones, there is need to designs new ATM terminal recognition systems to verify the IRIS or face of the Account holder of the bank at ATM Center. The use of Biometric ATM's based on IRIS recognition technology providing a safe and paperless banking environment. The iris recognition system completely eliminates the chances of fraud due to theft and duplicity of the ATM cards. This project will detect the iris of the user and allows the person to make transactions, by using matlab it detects the human IRIS and allows person for the transaction and sends the message automatically. Once we receive the OTP we need to enter that key and then it allows the transactions, plus when the attacker try to damage the ATM machine vibration detection sensors gets activated. A message is passed to the nearby police stations with the help of GSM modem and door will get lock. We can remotely monitor the user accounts for Authorized or unauthorized Access by using Internet of Things (IOT).

Keywords— IRIS recognition, One-Time Password (OTP), ATM Security, Biometric, GSM, Vibration sensor.

I. INTRODUCTION

Automated teller machines (ATM) were first started to used in year of 1939. Nowadays, about 1.5 million are installed worldwide. ATMs are now found in many locations. For e:g ATMs are typically found in restaurants, Convenience stores, malls, supermarkets schools, gas stations, hotels, work locations, banking centers, airports, and entertainment. There are different aspects that should be considered. One of the paramount consideration issues is security because all over the world is an increasing use of ATMs and it mean that risks of hacking turn to be a reality more than before. Automated teller machine well known as the ATM is a computerized telecommunication device and it enables its customers to access their bank deposits or credit accounts in order to make a variety of transactions such as cash withdraws, check balances etc without any need for a cashier or human clerk. In conventional ATMs the identification of the customer is done using a PIN number .Here there is a possibility of hacking of passwords more over memorizing a password (PIN) and carrying smartcards in a significant overhead to users. Nowadays there are many persons which uses technological progress in circumvention of humans to steal their money, like Skimming Attack, Card trapping, PIN Cracking, ATM Malware and ATM hacking. So there is need to make framework with more secure and make unenlightened people able to use ATMs with quick secure way, it lead us to use biometrics which use human traits. Now a day, Government of India has taken up Digital Payment mode across all sectors Related to billing and Transactions with development in the banking sector, security implementation has become priority to check the Authentication of the Account Holder. ATMs and Various Digital Payment modes are found in many locations. [2]Considering the development in the digital payment mode the security systems also needs to be uplifted with various modes and characteristics.

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II.PROBLEM DEFINITION

There is increase in cyber crime and hacking of bank accounts by introducing viruses that can corrupt or decode the passwords without any human interference. To avoid the loopholes in the system as mentioned below we have introduced human characteristics to shelter the inheritance of the system.

Problems in Existing Systems

1] Card Theft: In some ATM Machines Hooks are attached to the probes preventing the card from being returned to the consumer at the end of the transaction.

2] Skimming Devices: Skimming method is the most frequently used method of illegally obtaining card track data. Skimmers are devices used by criminals to capture the data stored in the magnetic strip of the card.

3] Shoulder Surfing: Shoulder Surfing method is the act of direct observation, watching what number that person taps onto the keypad.

4] Utilizing a Fake PIN Pad Overlay: In this case, a fake Pin pad is placed over the original keypad. This overlay of PIN pad captures the PIN data and stores the information into its memory. The Duplicate PIN pad is then removed, and recorded PINs are downloaded. [15]

III.LITERATURE SURVEY

Frauds in ATM's are increases day by day. So we need to provide security to the ATM machine to prevent these frauds. The following are the different technology used to solve the ATM Frauds.

A. GSM based Technology

B. RFID Technology

C. Biometric Technology

The brief discussions about these technologies are as follows.

A. GSM based Technology

Global System for Mobile Communication (GSM) which is wireless network also it has low power, low cost and easy to use. It behaves like a dial-up modem also it support extended AT commands which are defined in GSM standard. GSM is used by billion people across the world. GSM modem accepts a SIM card and operates a subscription to a mobile operator. The computer uses GSM modem to communicate over the mobile network when a GSM modem is connected to the computer. GSM modem is like a mobile phone it is used to provide internet connectivity. It is also used for sending and receiving SMS. GSM modem is a device which has a serial, USB and Bluetooth connection. GSM network operate in different bands depend on the country, but most of the GSM operate in 900 MHz or 1800 MHz bands. America uses 850 MHz and 1900 MHz bands.

The researchers Arjun Kumar Mistry, Suraj Kumar and Vicky Prasa proposed a system, Secured Atm Transaction Using GSM , in which they provide security to ATM transaction. In this system whenever a user wants to make transaction user have to enter the pin number, if the password matches then a message will be send to corresponding account holder throughGSM. The machine also gets acceptance message from an account holder. If acceptance message is delivered to the machine then machine allow doing further transaction else machine denies the transaction. [5]

The researchers Siva kumar T., Gajjala Askok, k. Sai Venu prathap introduces ATM theft monitoring system [3]. In this system vibration sensor, DC motor, GSM stepper motor, Stepper motor is used to secure ATM machine. Whenever robbery occurs in ATM center, vibration generates from vibration sensor and due to this beep sound is comes from buzzer andDC motor is used for closing the gates and stepper motor used to leak the gas inside the ATM center. The

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camera is also there to take the video from ATM center and send to the computer for saving a video. Here GSM is used to send a message to the nearby police station and bank whenever robbery happens in ATM. [5]

B. RFID Technology

RFID Technology mostly used for a security purpose. It is also used in a library, for antitheft security, E-passport etc. Radio Frequency Identification (RFID) Technology is used for security purpose. RFID technology is used to identify a particular person is authorized or not.In this technology, RFID tag and RFID reader is important. RFID tag which is a small device for data transmission. There are three types of RFID tags.

a) Passive RFID tags

b) Active RFID tags

The Passive RFID tags are a small and less expensive; they have no onboard power supply. They derive their power from RFID reader. In other hand, Active tags have an onboard battery so it is expensive. The range to read active tag is larger than the passive tag. The passive tag can operate only when there is RFID reader else it will be inactive. Normally Passive RFID tags are used for security purpose. Passive RFID tag consists of a small microchip, which stores a unique Electronic Product Code (EPC) number which is transmitted to the reader within RF range. In this system RFID tag is used for authentication. After detecting authorized user, the user has to enter correct PIN then 4 digit codes is send to the registered mobile number through GSM. This 4 digit code has to enter further transaction after entering this code further transaction will be complete.GSM based system has required more time to make a transaction as compared to RFID-based technology. The security provided by the RFID technology is not secure. [5]

The drawbacks of RFID are as follow:

1] RFID card can be track easily.

2] The communication between tag & reader can eavesdrop; it occurs when unauthorized reader intercepts the tag.

3] RFID can be cloned in which unauthorized copy can be prepared and this copy can be used for any purpose.

4] Whenever RFID card is stolen, that card can be misuse.

5] RFID card can be disabled using jamming so that RFID card stop working.

Due these drawbacks next techniques are introduced by the researchers.

C. Biometric Technology

The biometric system is a pattern recognition system which is operated by acquiring the biometric data from users and then extracting this feature of biometric data, after extracting this feature compare with the stored set of the database. Biometric technology is used for security purpose; it is more secure than RFID & GSM technology. There are various techniques that are used in ATM security:

i. Fingerprint Recognition

ii. Face Recognition

iii. IRIS Recognition

i. Fingerprint Recognition: Krishna Nand Pandey, Md. Masoom introduces system that the bank will collect the fingerprint from the customers which are stored in a database. Whenever customers have to make a transaction in ATM, customers have to place a finger in fingerprint module, and then module compares this fingerprint with database fingerprint. The customer has to enter this 4 digit code on the screen. If this fingerprint matches then the further

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transaction will proceed else transaction will be denied. There are three basic fingerprint patterns- Loop, Whorl and Arch. [11]

Disadvantages of Fingerprint Recognition

1] For some people it is very intrusive, because is still related to criminal identification.

2] It can make mistakes with the dryness or dirty of the finger's skin, as well as with the age.

3] Image captured at 500 dots per inch, resolution 8 bits per pixel demands a large memory space 240 Kbytes approximately so, compression is required.

ii. Face Recognition: Researcher Deepa Malviya proposed authentication for ATM using face recognition. In this system whenever the user wants to access their account users have to enter PIN after entering correct PIN, face will be scan from 3 angles. 3 angles are front, left & right angles. If all these face angles are matched then the user can access the account else card will be rejected. Face recognition means matching the extracted feature of a face with sample feature stored in memory. Face recognition technology is a very costly secure application. [11]

Disadvantages of Face Recognition

1] 2D recognition is affected by changes in lighting, the person's hair, the age and if the person wears glasses.

2] Digital camera equipment is required for user identification thus it is not popular.

iii. IRIS Recognition: The human Iris is an internal organ of the eye, protected by the eyelid, cornea. The iris is the colored portion of the eye that surrounds the pupil .It controls light levels inside the eye similar to the aperture of a camera. The round shape in the center of the iris is called the pupil. The iris are embedded with tiny muscles that dilate and constrict the pupil size. The iris features remain constant throughout the years. Iris recognition is a method of biometric authentication that uses pattern recognition techniques based on high-resolution images of the iris of an individual's eyes. Iris systems have a very low False Accept Rate (FAR) compared to other biometric traits like fingerprint, Face. The False Reject Rate (FRR) of these systems can be rather high. Image capturing method can be used to extract the unique iris pattern from a digitized image of the eye, and encode it into a biometric template, which can be stored in a database. IRIS recognition is done based on image Acquition, Segmentation, Normalization, Pre-processing stages.

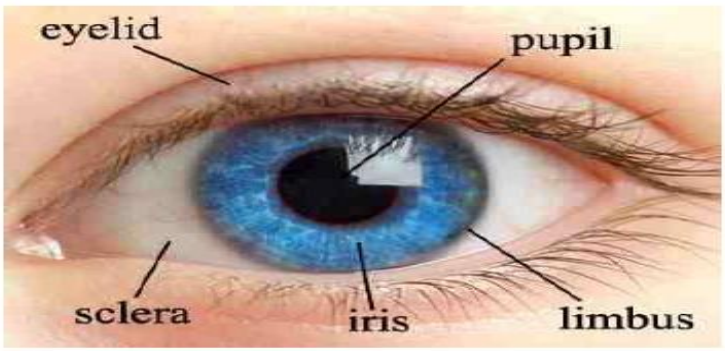

Fig.1 IRIS Image

Benefits of using IRIS Technology

1. Very high accuracy.
2. Uniqueness

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3. Stability
4. Externally visible highly protected internal organ.
5. Artificial duplication is virtually impossible
6. Probability of matching of two irises is 1:1078
7. Unique patterns.
8.Not genetically connected unlike eye color (Genetic independency)
9. Stable with age.
10. Impossible to alter surgically.
11. Living Password cannot be forgotten or copied.
12. Works on blind person.
13. User needs not to touch appliances.
14. Accurate, faster, and supports large data base
15. Right eye differs from left eye.
16. Twins have different iris texture.

IV.PROPOSED SYSTEM

There are some limitations in the previous technology used for ATM security, so there is a need to add some extra features in ATM security. The following diagram gives the proposed system which is used to enhance a security of ATM.

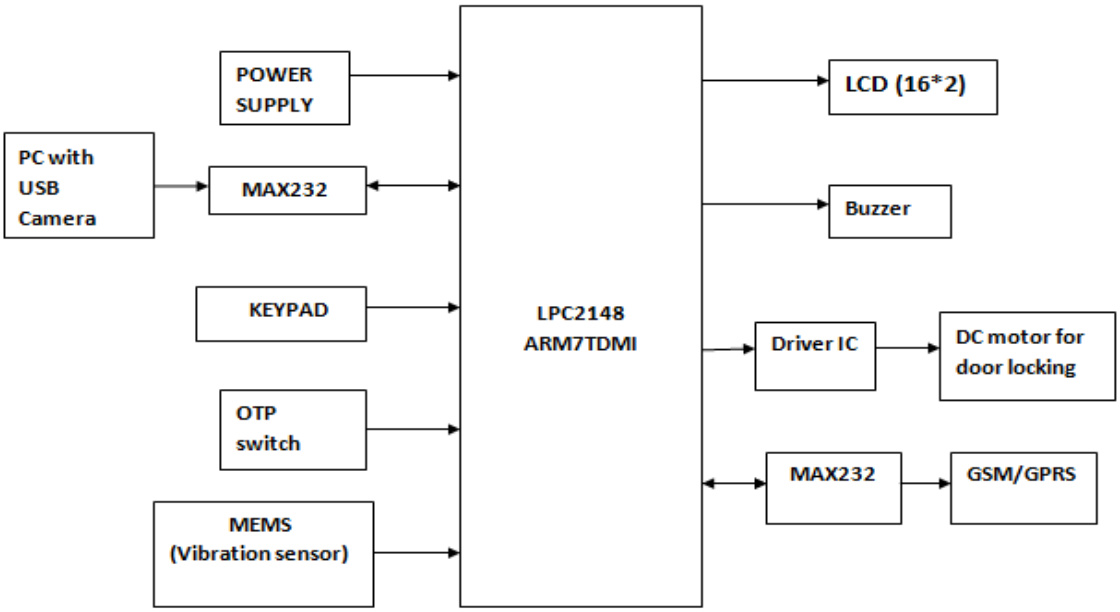

Fig.2 Block Diagram of Proposed System

Here we are interfacing the camera to the ARM controller. The USB camera will capture IRIS image of the person and send it to the PC Database, comparison will be done. Controller will recognize the iris of the particular person from the image. If they match then it will display the data on the display unit, and then a 6 digit code is messaged (OTP) to the customers' registered mobile number through GSM module connected to the ARM. It is only after entering this valid OTP that the user is allowed for making further transactions. For providing security to the ATM terminal from thieves we include a vibration sensor in the system. The vibration sensor will sense the position of ATM, in case of robbery the position of the ATM is changed then the sensor will automatically generate an alarm signal and will shut down the

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shutter of the ATM center. The turn off of the shutter will be done using a DC motor. By using the concept of Internet of Things (IOT),we can observe the authorize or Unauthorized Access of user Remotely

V.CONCLUSION

Securities provided by previous technologies are less significant and allowing frauds at ATM. There is a need to add some extra features in previous technology to enhance ATM security. Biometric technology is more secure than RFID and GSM technology. In the biometric method, rather than fingerprint, face recognition IRIS gives high performance. This concept will be very much useful in providing advanced high end Authentication and also problems such as carrying card etc will be avoided. As it offers high security, the unauthorized entry is restricted to maximum extent.

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