ADVANCED SECURITY ATM TRANSACTION

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ABSTRACT

Using an Automatic Teller Machine, customers can access their bank accounts. ATMs were originally developed as just cash dispensers; they have evolved to include many other bank-related functions such as Purchasing, Postage stamps, Lottery tickets, Train tickets. The problem is that, if our debit card is lost then we cannot transact the account. Also if our friend wants money from us immediately then we cannot give the money by ATM.
In this modern world ATM is being used by everyone. The security that is being currently used for ATM indeed has a few backdoors and it can be improved further. For the same In this system GSM module as well as biometric verification were introduced. But even the biometric system does not seem to be completely reliable and hence a contingency plan is needed in order to prevent catastrophes. Objective of this paper is to provide high level security to ATM by enhancing the already proposed biometric system and making it still secured by PII[Personal Identification Image] process. So a detailed study on various existing biometric systems is studied and also its limitations are listed. This paper proposes a novel method to meet out the challenges and strengthen the security mechanism. In the proposed security algorithm two phases are defined. These two phases provide two high level security and there by increases the security of ATM machine.

Keyword - *Secure transaction, Anti-theft, ATM Security Enhancement, Biometric In ATM, Fingerprint In ATM Security*
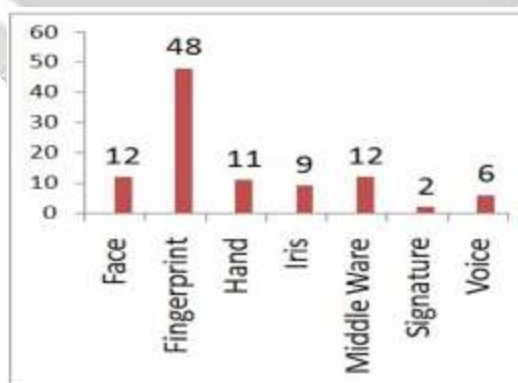
INTRODUCTION

Fig.1. Comparative survey of fingerprint with other biometrics

Biometrics technology permits determination and verification of identity through physical characteristics. to place it merely, it turns the figure in to his/ her watchword, that can not be impersonated by others. The biometric values area unit keep within the info for the comparison functions. The terms "Biometrics" and

"Biometry" are used since early within the twentieth century to check with the sphere of development of applied math and mathematical ways applicable to information analysis issues within the biological sciences. Recently, these terms have conjointly been wont to check with the rising field of data technology dedicated to machine-driven identification of people mistreatment biological traits, like those supported retinal or iris scanning, voice patterns, dynamic signatures, fingerprints, face recognition, or hand measurements, particularly for authentication functions. therefore biometry is outlined because the science and technology of activity and statistically   analyzing   biological   information.
They are measurable physiological and / or behavioral characteristics which will be utilised to verify the identity of a private.Fingerprint verification, iris scanning, face recognition, and voice verification area unit the methodologies for incorporating biometric systems with ATM machine.

1.1 SECURITY TO AVOID ATM FRAUD

ATM frauds increase day by day. So we need to give security to the ATM machine to prevent these frauds. Various researchers studied about the security of ATM and give a different solution to avoid these frauds. The following are solution for ATM fraud:
A. GSM based Technology
B. RFID Technology
C. Biometric Technology

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. 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 850MHz and 1900MHz band.

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 on board power supply.they derive Their power from RFID Reader. 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.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 [1][2]. This EPC number is unique. RFID reader reads this EPC number through an antenna.
The security provided by the RFID technology is not secure [7] [8]. The drawbacks are as follow:

    □□ RFID card can be track easily
    □ The communication between tag & reader can eavesdrop; it occurs when unauthorized reader intercepts the
.
    □ RFID can be cloned in which unauthorized copy can be prepared and this copy can be used for any purpose.
    □ Whenever RFID card is stolen, that card can be misuse.
Due these drawbacks next higher security techniques are introduced .

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
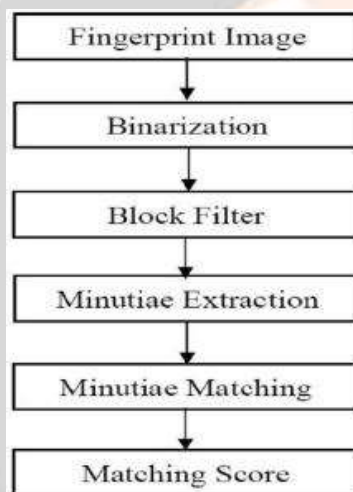
i. Fingerprint Recognition System:

In Novel Method to Enhance the Security of ATM using Biometrics [3] in which replaces the PIN number with biometric system.

In this system; the bank will collect the fingerprint from the customers which are stored in a database.

Each fingerprint has a unique identification number. Whenever customers have to make a transaction in ATM, customers have to place a finger in fingerprint module, then module compares this fingerprint with database fingerprint. If this fingerprint matches then the further transaction will proceed else transaction will be denied.

In this system, they proposed a system which extracts minutiae of the fingerprint. After extracting the minutiae it will be encrypted using blowfish algorithm. To extract minutiae there are two techniques Binarized fingerprint images and Gray-Scale Fingerprint Images. When encryption is done then this image is transfer to the server side and decrypted at the server side. Core points can easily find out after extracting minutiae.

The researcher combines fingerprint and GSM techniques for better security of ATM. Researchers introduce this technique in a paper [9]. In this system, bankers collect fingerprint of each customer as well as mobile number. Whenever a customer wants to make the transaction, the customer has to place a finger on fingerprint model. When fingerprint matches 4 digit code will be send in customer mobile number.

Flowchart of fingerprint recognition

The customer has to enter this 4 digit code on the screen. If this code is valid then the customer can process further access.

There are three basic fingerprint patterns-Loop, Whorl and Arch. This paper gives a flowchart of fingerprint recognition as follow:

As shown in finger there are 6 steps.

☐   Binarization means convert gray scale image into a binary image that is in 1 & 0 form. The threshold value is set to fix value.

☐   If the pixel value is above threshold value set „1" else it will be „0". After binarization fingerprint image is clearer.

☐   Block filter is used to reduce the thickness of ridge line into the single pixel to extract minutiae points.

☐   Minutiae Extraction is used to find out the location of minutiae.

☐   Minutia matching is used to compare current fingerprint image with a stored fingerprint image.
      To get efficient matching extracted image is stored in matrix form.

☐   Matching Score is used to calculate between current fingerprint image and stored fingerprint image [4].

Matching score = Matching Minutiae / Max(NT,NI)

Where, NT and NI represent the total number of minutiae in the template and input matrices respectively [5].

ii.   Face Recognition System:

In biometric techniques, there is another method called face recognition system. In ATM if a customer wants to withdraw money face recognition system is proposed for security. Researcher Deepa Malviya proposed [6] authentication for ATM using face recognition from 3 angles. Facial characteristics are analysis such as face cut, mouth etc. of the user in the face scan technology.

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.

In face recognition, there are some drawbacks if face and camera are not at the proper distance, face size will be reduced due to this there will be a problem of matching a current facial image with stored facial image. To get appropriate matching it should necessary that face at proper angle and distance between camera and face at a proper distance.Face recognition technology is a very costly secure application. Fingerprint recognition technology performance is high as compared with face recognition technology.

The researcher implemented Improving ATM Security via Face Recognition in this system [10] for a transaction; user's face is compared with stored image in the database if that match then the user can make a transaction. In this system for extracting face feature PCA(Principal Component Analysis) algorithm is used. This algorithm converts face image into Eigen face. Also, locate anchor points at eyes, nose, and mouth. Unique face image is creates after measuring distance and angles of the net,In this system pose variation gives a problem.

1.2 PROPOSED SYSTEM

In this project we analyzed what is the problem people faced in the existing technology. Especially Multifactor Authentication (MFA) method provides more complexity to the user. This project helps to overcome the problem of complexity and provides easiest way to secure the ATM transaction.following diagram gives a proposed which is used to enhance a security of ATM.
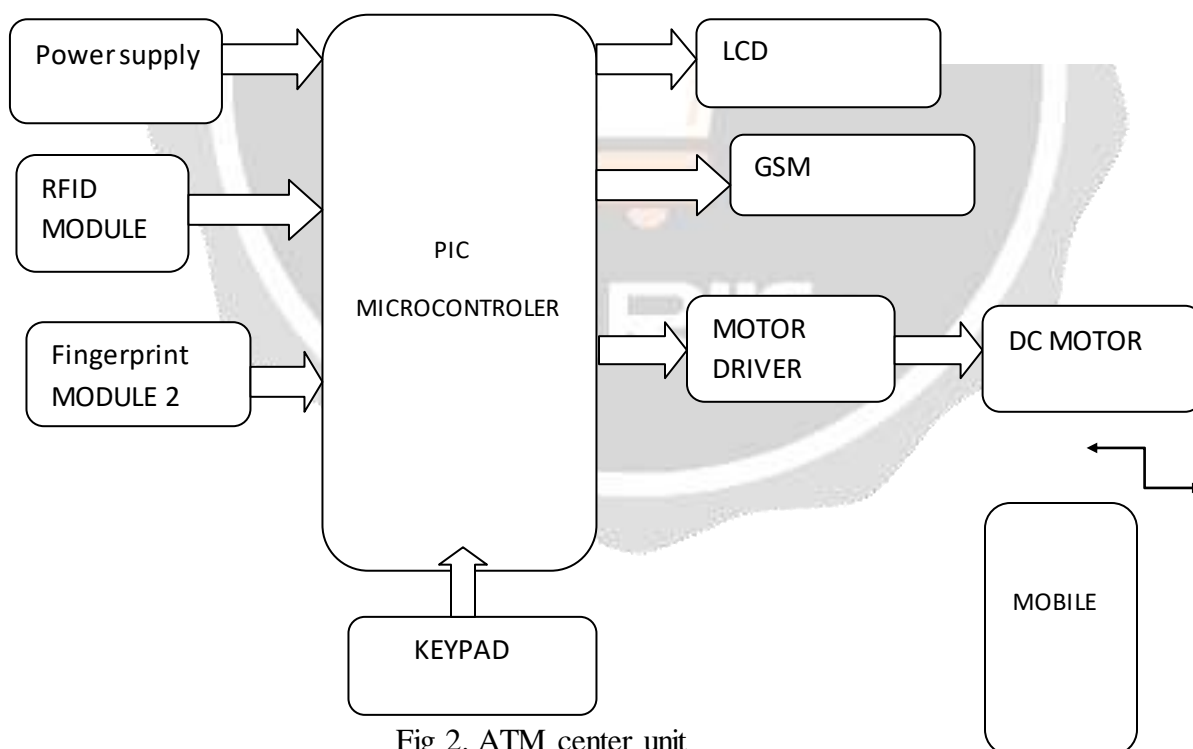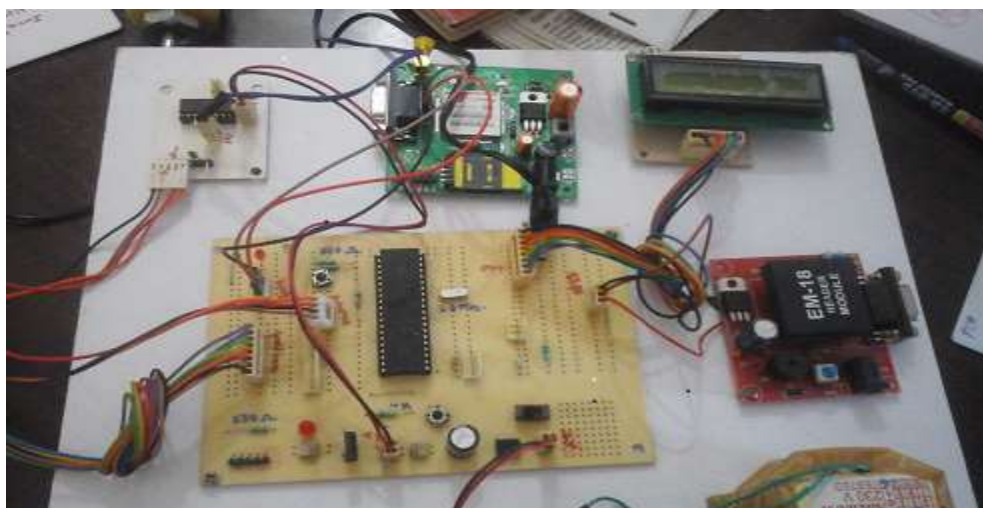

Fig 2. ATM center unit

Fig -3 actual model

4. CONCLUSIONS

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, fingerprint recognition gives high performance as compared with face recognition technique. Due to the probability of high technology (GSM) used this "Protected Cash Withdrawal in ATM Using Mobile Phone" is fully software controlled with less hardware circuit. The feature makes this system is the base for future systems.

Advantages:

1. Advanced ATM system provides multiple level of authentication.

2. Biometric system ensures high level of security for ATM users.

4. This system shows Good time response.

5. This is user friendly system.

6. It is possible to implement this system in Low cost.

 Application:

1. Library management.

2. Laboratory authentication.

3. Industrial authentication.

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