IJCTA, 9(21), 2016, pp. 267-271

Enhancement of the Level of Security in ATM using Biometric Techniques

Rashmi Singh* Vipin Saxena*

Abstract **:** In present scenario the rapid growth in electronic transactions has result a great desire for fast and valid user identification and authentication. Access codes for banks accounts, credit cards and computer systems generally use personal identification numbers for identification and security checks. Biometric based authentication provides several advantages over other authentication methods. The use of biometrics can provide a much more specific and valid user authentication method. Biometric identification introduces an automatic recognition of human based feature vector derived from their physiological and physical characteristic. This study shows that how to enhance security of transactions in ATM system using password with fingerprint verification. The aim of this study is to develop ATM based fingerprint verification operations in order to reduce frauds related with the use of ATM.

Keywords : Electronic Transaction, Authentication, Access Codes, Biometric, Automatic

1. INTRODUCTION

In the present time Automated Teller Machine is most commonly used device by people for their money related transaction. Bank provides services according to their bank timing and it takes more time in transaction as compare to using ATM. People can withdraw money from ATM at any time and from anywhere whenever they required. But the use of ATM with entering four digit passwords is not authenticated because any one can use another ATM card if he or she knows only the password. So the use of only password in ATM transaction is not secure. To do a secure transaction we need password with biometric that provides authentication. The use of biometrics with password in ATM increases the level of security and it is safe from hackers. In ATM the use of biometrics ensures that the user is valid but in traditional method PIN is not provide identity verification. Biometric data is unique for each user and can't be shared or lost.

2. REVIEW OF LITERATURE

This paper combined PIN verification and fingerprint for identification of users. In this technique, information is recorded in the GSM modem connected to the microcontroller which generates four digits OTP. The fingerprint of the card holder are collected and stored in the database. The OTP should be entered after that the customer can proceed [1]. Now days several other methods are used to protect the ATM machine such as fingerprints. In case of emergency when card holder is unable to do the transaction, the nominee finger prints and family member fingerprints are used to access the ATM Machine. There are some limitations in traditional method that users are restricted to use their password only three times but fingerprint technique will solve this problem and increase the level of security [2]. In earlier times, there are so many criminal cases that may financial losses to the customers. To overcome this type of problem, now a day's simple fingerprint recognition is used. This system includes fingerprint scanner which is able to capture fingerprints with its processors and optical sensor. This technique required low power and portability [3]. In modern times, there is a system in which bankers will collect fingerprints and mobile

* Department of Computer Science Babasaheb Bhimrao Ambedkar University, Lucknow (A Central University), Vidya Vihar, Raebareli Road, Lucknow 226025, (U.P.), India rshmi08@gmail.com, vsax1@rediffmail.com

number of customers while opening the new account. In this system customer switch for entry and has to place its finger on finger printing machine. This system check if the fingerprint is valid or not, then ATM machine will ask four digit pin and if the pin is matched then the system will automatically generates another one time password and this password will be message to the customers mobile number, then the customer has to enter this OTP code. If the code is matched, then the customer can further access the ATM machine [4]. In ATM machine, PIN numbers are used for identification of the user. In this paper ATM machine combined with fingerprint biometrics technique to enhance the ATM security level [5]. IN this era of time cyber crime are rising continuously. So for the purpose of security, the biometric system used for authentication of E-banking. System utility scale is used to evaluate the effectiveness of biometric system. It is reported when the biometric system is evaluated; its different components are needed to be considered like biometric technology and the institutional process which is helpful in verification and authentication [6]. In this paper, the adoption of biometric technology in developing countries from institutional point of view is discussed. The result of this technique shows that managerial and operational positions could influence perceptions of innovative ideas in the adoption of biometric system [7]. In the recent time wide variety of biometric models have been tested but some factors make hurdles in the accuracy of monomodel biometric systems. Usually multiple modalities provide better accuracy. This paper shows the potential for biometric technology and its prospects [8]. Biometric systems have potential to improve the security level and enhance the convenience of the payments of customers. Along with these benefits biometric system is not adopted by large scale ATM machine. In this paper a method is proposed in which biometric system is combine pin based authentication. The data suggest that the fingerprint system have the benefits like cost reduction, better security and customer convenience as compared to pin system. This is the reason that explains why large scale biometric payment system in Europe and United states suggest that biometric system is more appropriate for payments [9].In online applications there is convenience for individuals in organizations that they can utilize authentication challenges. One solution is to utilize the behavioral type patterns to provide authentication, such type of biometric have the advantage of being revocable, as compare to physical biometrics such as fingerprints. In this paper authentication accuracy can be achieved through optimal pin selection [10]. The iris and face biometric system is used to accurately identify a person. The unimodel biometric systems have some limitation because there is no single biometric which can need the requirement of real world applications. In this paper there is combination of face and iris biometric traits. This type of biometric system achieves high accuracy [11]. This paper provides a new concept in biometric system; it includes face recognition and OTP. Face recognition technology helps the machine to identify the user at the time of transaction. This system can reduce the chances of frauds and the OTP system restrict the user from the remembering the PIN because OTP itself acts as a PIN [12]. In this paper simulation study are performed for the fusion of algorithm which facilitates multimodel biometric user authentication. In this study transformation based score fusion method with voice and face recognition are used. The simulation studies are helpful in user registering and their authentication with the help of voice recording and face images. Simulation results shows that it is a better option as its performance is meet to the real life requirements [13].

3. BACKGROUND

3.1. Biometric System

The term “Biometrics” is derived from two words bio means fife and metric means to measure. The biometric system is used to analyze the personal characteristics like fingerprints, voice pattern, thumb impression, iris, and others. These biometric system characteristics are not stolen by any one.

- A biometric system consists of Image acquisition module, feature extraction module, matcher module and database module. In image acquisition module a image is required for further processing.
- It requires salient or discriminatory features.
- Matches the extracted features of probe image to obtain a match score.
- It contains the digital representation of previously occurred samples which is known as templates.

Biometric system is operated through various modes such as verification, identification, and screening. The advantages of biometric system are that it is difficult to copy, share, and distribute.

- It cannot be lost or forgotten because the person is physical present.
- It is reported that biometric system plays very major role in aspects of bank protection.

3.2. Different biometric Technologies

There are different biometric technologies are described below :

Method	*Description*
Thumb Impression	This method is based on patterns of thumb
Hand Geometry	This method involves measurement of shape of hand
Iris	This method is used for analyzing the colored ring of the tissue surrounded to the pupil
Face	In this method characteristics of face such as structure, distance between nose, eyes, mouth etc analyzed
Retina	In this method the layer of blood blesses situated at the back of the eye is measured
Vascular Pattern	In this method picture of veins in a human hand or face is measured. The veins are unique in each individual so it is helpful to identify the person
Signature	This method is used to analyze the way of user signature for the authentication
Voice Recognition	In this method the system converts the users voice into text for the purpose of authentication

4. PROPOSED METHOD

Step 1 : In our proposed mechanism the user has to swap the ATM card and enter the password.

Step 2 : If the previous step is follow then proceed for the step 2 in which the user has to put their thumb on the thumb scanner in ATM machine.

Step 3 : After the feature extraction the rest processing is occur in the bank database.

Step 4 : When the information of user is matched by the database then he can further proceed for money transaction and if it is not matched from the bank's database then user cannot make any transaction.

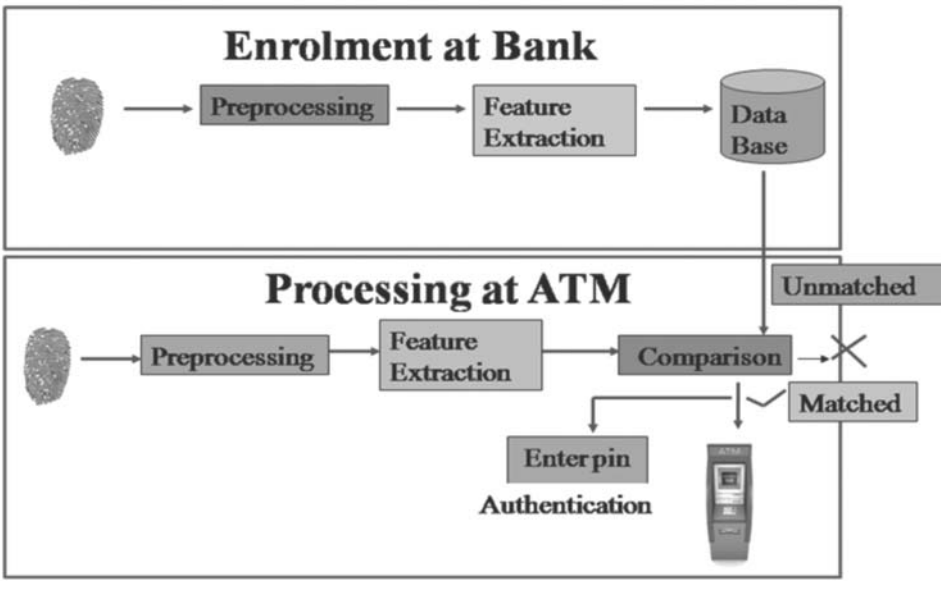

Fig. 1. Figure for Biometric use in ATM machine

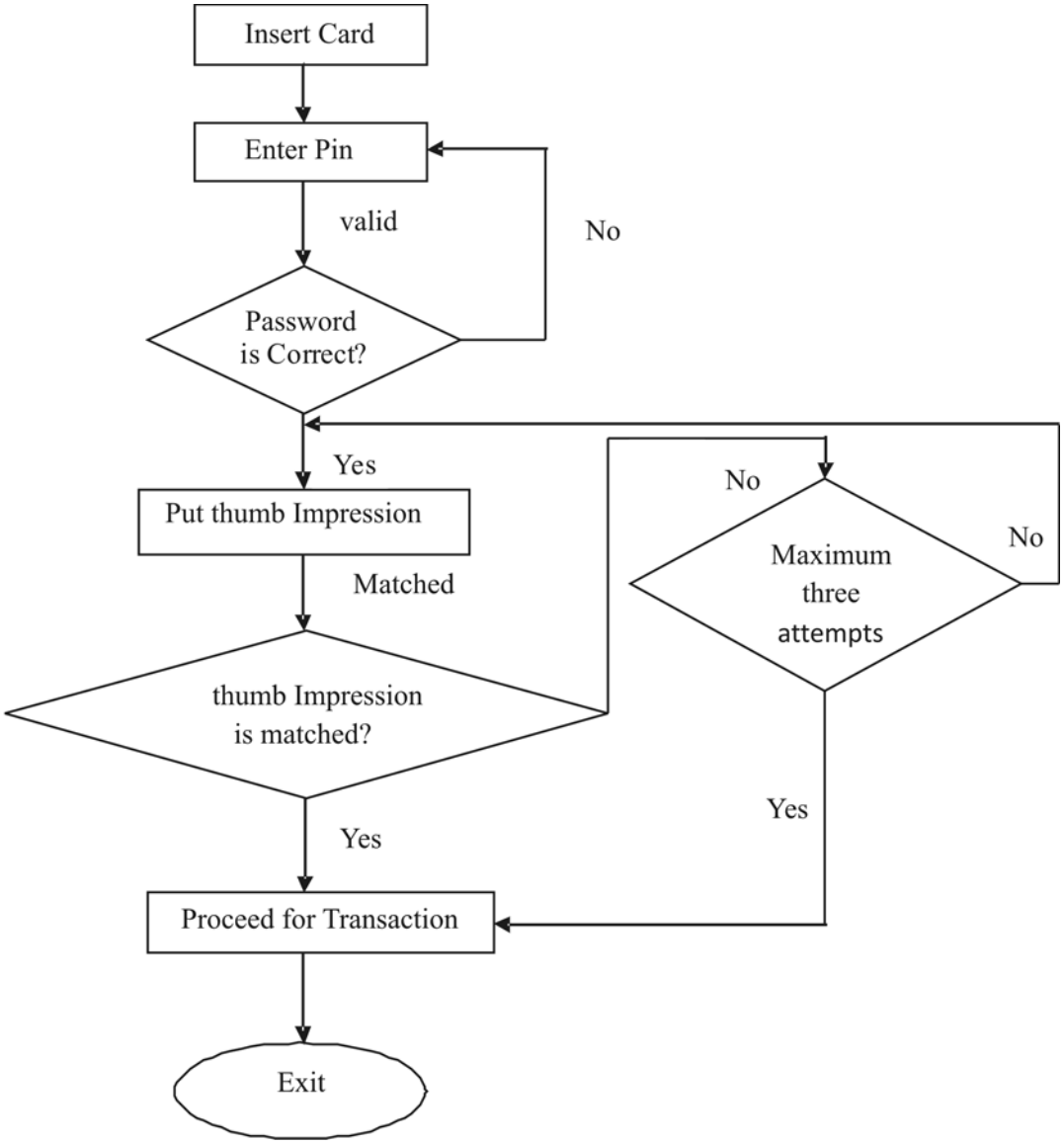

Fig. 2.

5. CONCLUSION

In the developing countries ATM machine has become latest and easy technology which provides financial services to a large number of populations. Now a day's biometric system which includes thumb print is easily acceptable because it is reliable form of security through identification and verification of a person. In this paper we introduce thumb impression with password system to enhancing the security of ATM machine. When this system is fully developed then it will reduce the rate of crime associated with ATM machine. This system will provide various facilities as positive identification of the user, identification of user on a large scale and screening. The aim of this study is to develop ATM based Thumb impression verification operations in order to reduce frauds related with the use of ATM. The use of biometrics or characteristics is tightly connected to an individual and cannot be forgotten, shared, stolen or hacked. These characteristics can uniquely identify a person.

6. FUTURE SCOPE

In this paper we are using Thumb impression with password for authentication of user. This method is dependent on the Biometric System *i.e*. thumb impression scanner. In future it will be very easy to implement this technique because every person has its own thumb impression and nobody can copy it. The system has several advantages like we do not forget our thumb impression so this method can easily protect the user from frauds.

7. REFERENCES

1. V.Padmapriya, S.Prakasam "Enhancing ATM Security using Fingerprint and GSM Technology", *International Journal of Computer Applications*, Volume 80, No. 16, October 2013.
2. Kaur J., Malhotra S., "An Overview of ATM Security Using Biometric Technology", *International Journal of Advanced Research in Computer Science and Software Engineering*, Volume 4, Issue 3, March 2014.
3. Pandit R. Vaibhav, Joshi A. Kirti, Bawane G. Narendra "ATM Terminal Security using Fingerprint Recognition", *International Journal of Applied Information Systems (IJAIS)* – ISSN : 2249-0868, Foundation of Computer Science FCS, New York, USA, 2nd National Conference on Innovative Paradigms in Engineering & Technology (NCIPET 2013).
4. Khatmode Ranjit P., Kulkarni Ramchandra V., Bharat Ghodke, P P Chitte, Anap S. D., "ARM7 Based Smart ATM Access & Security System Using Fingerprint Recognition & GSM Technology", International Journal of Emerging Technology and Advanced Engineering, Volume 4, Issue 2, February 2014.
5. Moses Okechukwu Onyesolu, Ignatius Majesty Ezeani, "ATM Security Using Fingerprint Biometric Identifer: An Investigative Study", (IJACSA) International Journal of Advanced Computer Science and Applications, Vol. 3, No.4, 2012.
6. Rana Tassabehji, Mumtaz A. Kamala "Evaluating Biometrics for Online Banking: The case for Usability" *International Journal of Information Management*, Elsevier publication, 32, pp. 489-494, 2012.
7. Faith-Michael E. Uzoka, Tshepo Ndzinge "Empirical analysis of biometric technology adoption and acceptance in Botswana", *The Journal of Systems and Software*, Elsevier publication, 82, pp. 1550–1564, 2009.
8. J.A. Unar, Woo Chaw Seng, Almas Abbasi "A Review of Biometric Technology along with Trends and Prospects", *Pattern Recognition*, Elsevier publication, 47, pp. 2673-2688, 2014.
9. Jeroen Breebaart, Ileana Buhan, Koen de Groot, Emile Kelkboom, "Evaluation of a template protection approach to integrate fingerprint biometrics in a PIN-based payment infrastructure", *Electronic Commerce Research and Applications*, Elsevier publication, 10, pp. 605-614, 2011.
10. Benjamin Ngugi, Marilyn Tremaine, Peter Tarasewich, "Biometric Keypads: Improving accuracy through optimal PIN Selection", Decision Support Systems, Elsevier publication, 50, 769-776, 2011.
11. Hiew Moi Sim, Hishammuddin Asmuni, Rohayanti Hassan, Razib M. Othman, "Multimodel Biometrics: Weighted score level fusion based on non-ideal iris and face images", Expert Systems with Applications, 41, 5390-5404, 2014.
12. Mohsin Karovaliya, Saifali Karedin, Sharad Oza, D. R. Kalbande, "Enhanced security for ATM machine with OTP and Facial Recognition Features", International Conference on Advanced Computing Technologies and Applications (ICACTA-2015), Procedia Computer Science, Elsevier publication, 45, 390-396, 2015.
13. Firas S. Assaad, Gursel Serpen, "Transformation Based Score Fusion Algorithm for Multi-Model Biometric User Authentication through Ensemble Classification", Elsevier publication, Procedia Computer Science, 61, pp. 410-415, 2015.