NOVEL MECHANISM TO IMPROVE ATM SECURITY

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Abstract:

Security is an important and essential one for every field especially in banking sector. In this modern world, we are all depending on the ATM machines for deposit, withdrawal and also transfer the money. Nowadays banks face more security issues like ATM robbery. This research will propose a new approach to prevent from ATM fraud. This paper proposes two step verification processes which include finger vein recognition and one time password for identifying authorized user. It provides more security and also easier for customers to access the ATM. The highlight of this work is, suppose if the person unable to come to the ATM's place they will allow other persons with their knowledge to do their transactions. Using this approach the customer can avoid robbery and misuse by unauthorized persons.

Keywords: ATM, Finger vein, PIN, Security

I. INTRODUCTION

This research is based on the ATM security. In these modern days, people interacts ATM for several banking services not directly with bank employees. Using an ATM, customers can access their bank deposit or credit accounts in order to make a variety of financial transactions like cash withdrawals and balance checking, as well as transferring credit to and from mobile phones. So, the ATM can play a vital role in our daily life. Customers are typically identified by inserting a plastic ATM card (or some other acceptable payment card) into the ATM, with authentication being by the customer entering a personal identification number (PIN), which must match the PIN stored in the chip on the card (if the card is so equipped), or in the issuing financial institution's database.

Usually people use personal identification number (PIN) for security. In this digital world, numbers of ATM units are increased at the same time numbers of crimes such as ATM robberies, unauthorized access are also increased. Due to the lack of security in previous security mechanisms, one powerful security mechanism is needed for people those who are using ATM. That's why this proposed mechanism is introduced. This mechanism use two step verification, that includes finger vein authentication technology along with OTP verification for identifying an authorized user.

Finger vein biometrics identifies a user based on the vein patterns in their fingers, which are unique to every person. It is also known as vascular biometrics, as the identifiable information is from the blood vessels beneath your skin. As a result, the reader can scan the user's unique pattern of veins. Every user has unique vein patterns so it is impossible to be forge or copy[10].

II. LITERATURE SURVEY

Darwin Nesakumar A et.al. (2020), proposed a new model in which only when card holder allows the person has the ability to access. To find the unauthorized

customer the image of the person will sent to the account holders registered mail id[1].

Chetan M Parashar,et.al.(2020), did a research, in that if customer violating the ATM usage rules by wearing helmet or mask and using weapons the alarm will ON and the door will close automatically[2].

John Thangavel .P et.al. (2018), given new idea that focused on ATM Security through vascular technology. When unauthorized finger is pressed, the ATM door will be closed automatically with a buzzer sound[3].

Deepak G. Deshekar (2016), developed a new solution for ATM security, in that, ATM send the authentication message to the account holder's mobile number. If user replied YES then the transaction will occur. Otherwise it terminate the process[4].

Sugantharaja Radhakrishnan & Venkateshan Baskar(2014) , focused on smart recognition to identify the authorized human for security. Every individuals have a unique finger vein. Sofinger vein technology is mostly used for biometrics[5].

III. RESEARCH METHODOLOGY

This proposed system, allows only a valid account holder. If others will want to access the ATM by using account holders ATM card only with the knowledge of authorized account holder. Once the customer inserts the card into the ATM, it requires a PIN to verify the customer. If the PIN is valid, then it requires the finger vein recognition.

The system compares the finger vein of the customer which is already stored in the bank database. This can be done with the help of finger vein scanner. If the finger vein

is matched then the ATM will allow for access the account. Incase finger vein won't match then the message containing the OTP will be sent to the account holders registered mobile number. By entering that OTP, the system will allow for transaction otherwise it will stop the process. The following Figure 1 depicts this methodology.
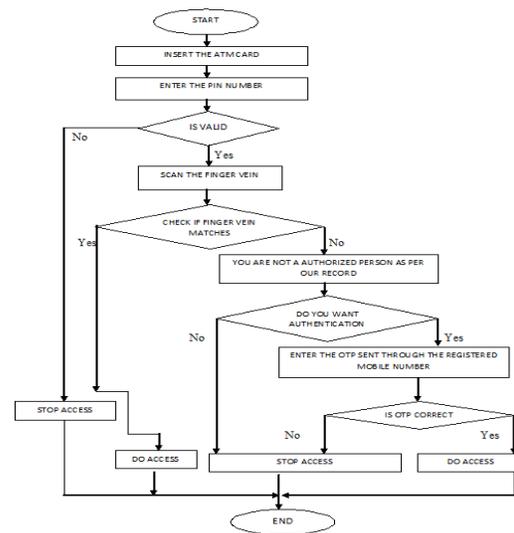
The following algorithm explains this methodology step by step.

STEP 1: Insert card into the ATM machine

STEP 2: Enter the PIN number

STEP 3: If PIN is valid GOTO STEP 5

STEP 4: If PIN is not valid GOTO STEP 11

STEP 5: Scan the finger vein

STEP 6: If the finger vein matches with the database GOTO STEP 10

STEP 7: If the finger vein doesn't matches with the database then the screen will display "You are not a authorized person as per our record do you want authentication?".

STEP 8: If the user enters YES and the OTP which is sent to the registered mobile number is correct then GOTO STEP 10 other wise GOTO STEP11

STEP 9: If the user enters NO then GOTO STEP11
STEP 10: Allow for transactions
STEP 11: Terminate the process
STEP 12: Eject the card

IV. RESULTS AND DISCUSSION

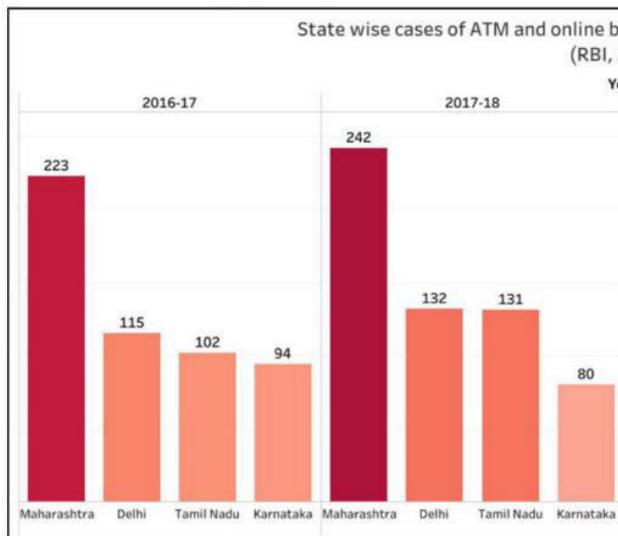The following Figure-1 shows the number of fraud cases occurred throughout India during the year 2019.

Figure 1: State wise cases of ATM and online banking frauds

The following Figure-2 shows that every year the number of cases pending at the end of every year is increased. So, stopping new cases is the only solution.
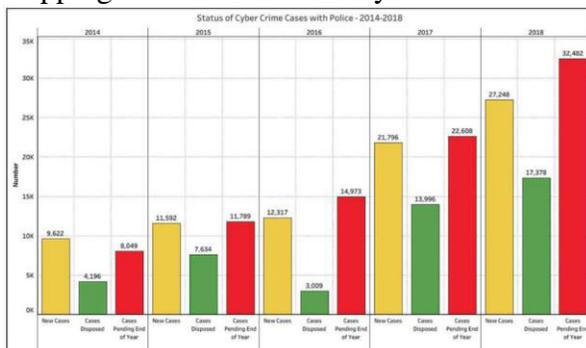

Figure 2: Status of Cyber Crime cases e wise cases

Even though, lot of development done after every year, the online frauds still continued due to many reasons. The main cause of these frauds is improper authentication. This loop hole is stopped by finger print, finger vein and OTP. Each and every method is having its advantages and implementation disadvantages. If we hybrid all these good methods in a effective manner, the customer will get better safety. In the following table that is clearly shown. This data is collected from cyber crime department of Thanjavur after analyzing for three years. The following Table-1 shows the number of cases per day in various methods.

Table-1: Number of cases per day in various methods

Method	No of cases per day
PIN Method	200
OTP Method	50
Finger Vein with OTP	3

The following Figure-3 shows the graphical representation of the above Table-1.
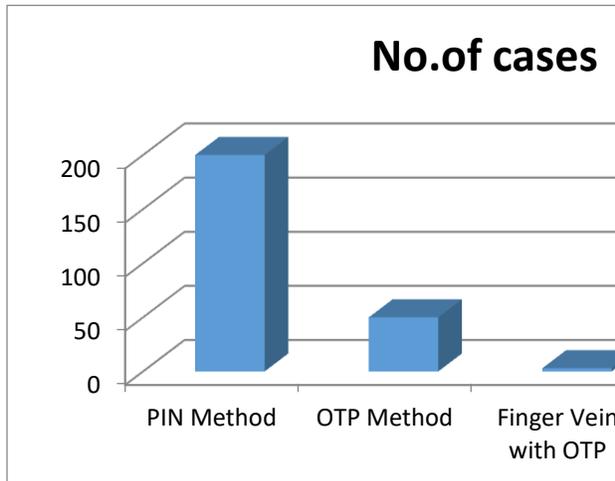
Figure-3: Status of Cyber Crime cases e wise cases

This result clearly shows that if we hybrid more mechanisms, the ATM security level will be increased tremendously.

V. CONCLUSION

This methodology can eliminate the unauthorized access. It provides more security by two step verification process. In previous security mechanism like finger print can easily be copied or forged. But finger vein is impossible to forged or copied because every person have unique vein patterns. Through this approach, others who is not the account holder of the card will wants to access the card only by getting the permission from the authorized account holder through OTP.

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