AUTOMATED TELLER MACHINE SECURITY SYSTEM USING BIOMETRICS AND THEFT DETECTION

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Abstract— This paper presents an Automate Teller Machine (ATM) surveillance system which is a smart system based on embedded technology and incorporates various sensors to continuously monitor its surroundings for suspicious activities like physical attack, fraud and theft that might jeopardize the ATM and people nearby. Also discussed is the security and safety measure that can be implemented to prevent such raids by proper surveillance and analyses the different forms of physical attacks on ATM.

Keywords—Cardless ATM; Fingerprint Module; Internet of Things; Temperature and Vibration Sensor; ATM Security

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1. INTRODUCTION

The existing self-banking system has got very high popularity with 24 hours service. Use of ATM is helpful for money transaction. ATM is activated by placing the card, then entering the pin number of the particular card. But this system is not safe to use because anybody can access the system if they have the card and pin number like we share our card and pin number to our friends who may miss use it. This is the main disadvantage of existing system. Traditional ATM systems authenticate the method has some defects. Using ATM card and password cannot verify the client's identity exactly. In recent years, the algorithm that the fingerprint recognition continuously updated, which has offered new verification means for us, the original password authentication method combined with the biometric identification technology verify the users identity better and achieve the purpose that use of ATM machines improve the safety .In the proposed system we are trying to remove disadvantages of existing system. So security over money Transaction is our prime concern. In traditional system client has to carry debit or credit card with him to verify his identity. This identity card may lose, so instead of traditional identification we are using biometric identification. Fingerprint recognition has got continuously updated algorithm in recent years which mean perfect biometric identification. The aim of project is to design a model to give high security while transactions in the ATM's. Main objective of this project is to develop a system by which the authentication is being provided by making use of fingerprint.

2. RELATED WORKS

In traditional ATM systems customer has to carry ATM card with him all the time for transactions. But it is not safe because it can be hacked by unauthorized person.

Duplication of the ATM card also available nowadays. Incase if someone miss their ATM card, it could be used by unknown persons.

Figure 1: ATM Card

3. ATM ATTACKS AND PROTECTION

There are a variety of ATM attacks because it is such an attractive target. We cannot list all the types, but highlights some popular ones. Basically, there are three basic types of ATM attacks which can be as follows.

Physical attack:

Brute force attack to ATM machines with intention of gaining access to cash within the safe

ATM Fraud:

Theft of bank card information

Software Attack:

Theft of sensitive information

Physical attack:

This kind of crime is active in most parts of the world, and is also showing a trend of escalation in Asia pacific area. According to a recent report release by European ATM Security Team (EAST), a total of 2,062 physical attack incidents in Europe.

Cutting:

Use rotary saw, blow torch, thermal lance, and diamond drill to brutally open safe gaining direct access to cash.

Figure 2: ATM cutting

Protection: Audible alarm or siren could help dissuade a thief from following through with their ATM theft. This will be one of the most effective methods to thwart an attempt to burgle an ATM. This system can detect if any suspicious event happens. Thermal sensors, vibration sensors, MEMS (Micro Electro Mechanical system) like accelerometers are the basic requirement in this system.

4. PROPOSED WORK

A. ATM USING BIOMETRIC

In our proposed system there absolutely no need to carry ATM card. There is possibility of fraud/hacking in the traditional system if the secret pin code is known to other person than user. In our system the possibility of fraud is highly reduced. Our system is 3 times more secure than traditional ATM system. In case the user has multiple accounts in different banks then in traditional system the user needs to carry different ATM cards for various banks, but in proposed system there is no such need, as the user does not to carry the ATM card at all.

By single authentication user can access multiple accounts, which is advantageous compared to traditional system.

This project deals with the design and implementation of fingerprint module in ATM machine. Whenever the transaction has to be done the fingerprint is inserted inside the ATM machine and it is verified with AADHAR card details if it is correct further transaction is proceed.If the fingerprint is wrong, further transaction will not be proceed.
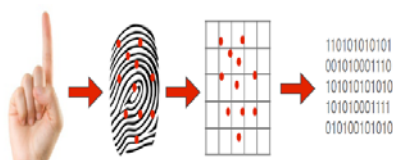

Figure 3: Fingerprint module

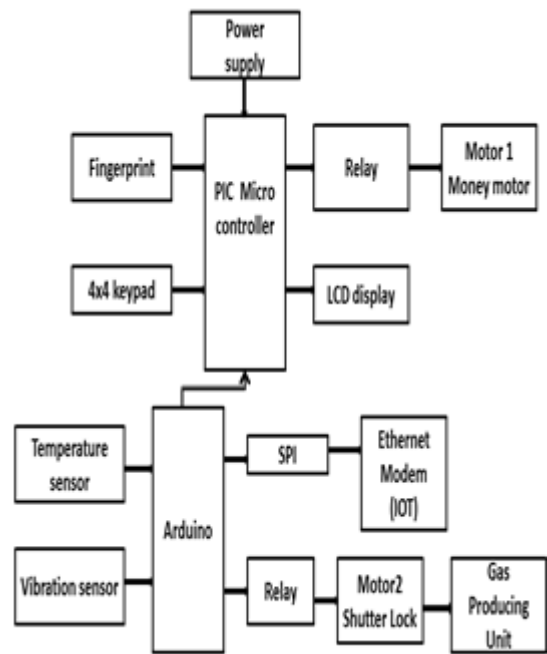Figure 4: Fingerprint Identification Code

B. BLOCK DIAGRAM

Figure 5: Block Diagram

C. THEFT DETECTION:

For theft detection we use temperature and vibration sensors, they provide additional security to ATM. If theft people damage the ATM means vibration sensor is used to find out the vibration and give the alert signal to the microcontroller. Microcontroller automatically locks the shutter.


Figure 6: Heating the Machine

When the machine damaged by the robberies therefore they can be damage the machine chassis using welding machine in sometime. In this case they will detect the uncertain level of temperature in machine (During welding machine is used) and alert environment. If these two sensors reach above the threshold value, alert will be given to the nearby police station through IOT

5. IOT SECTION

IOT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is expected to usher in automation in nearly all fields, while also enabling advanced applications like a smart grid, and expanding to the areas such as smart cities.

6. FLOWCHART
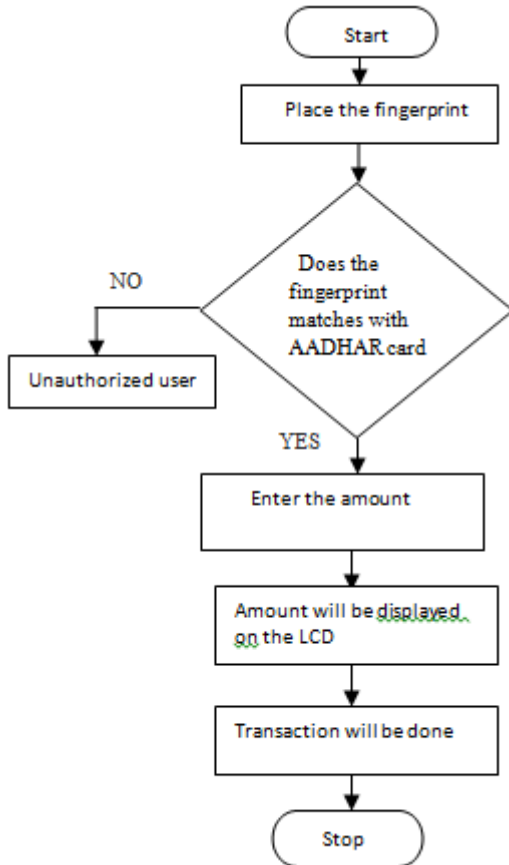
7. CONCLUSION

The biometric recognition technique makes the ATM system more secure. The biometric recognition has been developed for finger print scan with the help of unique identification code. This system will replace the current ATM card system and will definitely make the ATM system more flexible, secured and reliable. The finger print scan provides very high accuracy to the system. It is one of the developed biometrics. Our suggested system will be very much effective to reduce the ATM robbery. This secured system will also help the authority to take necessary steps before happening of a theft or unauthorized access. Limitation of this system may be a little bit costly as compared to a current ATMs, but when it's all about someone's money, potentially is more of this system. This advanced ATM theft security system will provide secured, smarter and better tomorrow for the human being.

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