Literature Survey on Safety of An Atm

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Abstract- *ATMs today have become areas of target due to their easy and readily available cash at everyone's convenience. A high level of surveillance more than the existing security needs to be implemented to prevent from fraud and theft that might jeopardize the ATM. In this survey paper, we look on the various methodologies that helps in building a more secure ATM system. This is achieved by using various technologies like centralized server for the ATM, biometric sensors, QR sensors etc. The usage of centralized sever will keep the information securely at one particular place. Sensors will help detect and notify the user about the changes in physical environment around the ATM machine. The survey paper also covers the areas of face and voice recognition so that disabled people can use the ATM. Usage of zigbee with GPS and GSM modules leads to location detection of cash transfer into ATM.*

Keywords- ATM, security, wireless, embedded technology, server,

I. INTRODUCTION

The advancements in the field of computer have led to may changes in various other sectors as well. Similarly, in the field of banking, the process of withdrawing or depositing money has been made simpler. For this purpose, ATM's [Automatic Teller Machine] is used. A widespread of ATM's can be seen in every nook and corner. This has its own pros and cons. Along with felicitating users to access money easily; it has also increased the rate of thefts. Due to this, the security of the ATM is a prevailing issue. This survey provides the current scenario for the security of the ATM. It also discusses about the advantages and disadvantages of various technologies that are used for securing the ATM. The traditional ATM card that is used has a Radio Frequency Identification [RFID] tag in it. This is very vulnerable and not secure for the user. The ATM's have CCTV camera's installed in them to safeguard the ATM but most of the times due to technical difficulties it does not work. For this reason, various methods are used to secure the ATM. Through this survey, we have put together the merits and demerits and also concluded by comparing the drawbacks for providing a better system.

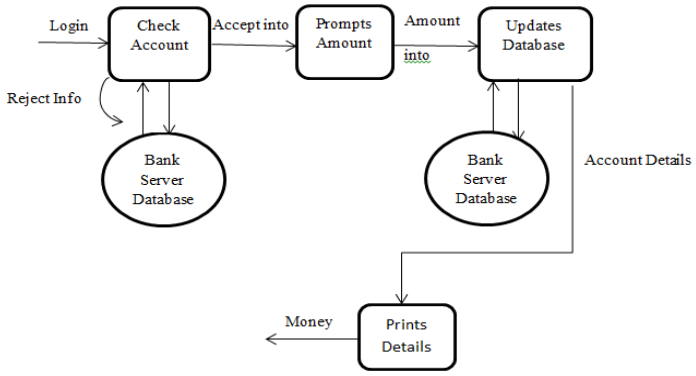

Fig. 1: CURRENT PROCESS OF MONEY WITHDRAWAL BY THE USER

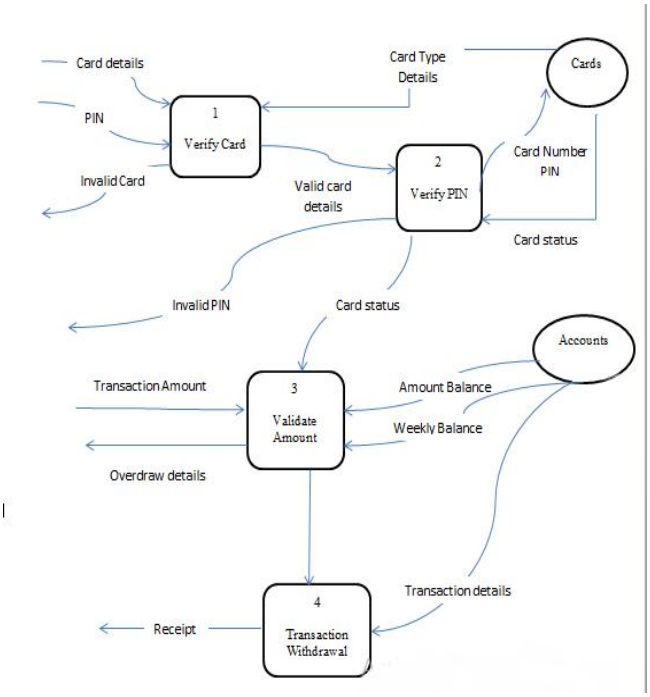

Fig. 2: CURRENT AUTHENTICATION SYSTEM IN ATM

The above image reflects the current scenario in the area of ATM system .Figure 1 depicts the process of money withdrawal by the user from the ATM machine. The PIN put by the user is verified by the server and the user is allowed to withdraw the cash. The conventional method of using a PIN to login has led to many serious issues. Peep attacking is one among them. Figure 2 depicts process of authenticating the

user and the inserted card. RFID used in the plastic cards are now easily duplicated. Also the present security at ATM to prevent physical attacks is poor. Therefore we are in need of having a system to avoid these issues. Technical advancements in the field of sensors and wireless technology will help us build a more secure system for ATM.

II. COMMONLY OCCURRING ISSUES

A major issue faced by the user in an ATM is peep attack and filming of their PIN number. This can thwart their privacy. Physical attacks are one of the prominent attacks that happen on the ATM. Many a times the cloning of the RFID tag on the ATM takes place which leads to duplication of cards.

III. LITERATURE SURVEY

1. Smart ATM security system using FPR, GSM, GPS

Security of the ATM is very necessary as it deals with a huge amount of money. In this paper, Bharati M Nelligani, N V Uma Reddy and Nithin Awasti[1] present various methods for enhancing the security system of the ATM. The embedded technologies play an important role in this. RFID card, IR sensor, finger print scanner, GSM, GPS is used for securing the ATM in various aspects. These technologies help in dealing with the problems of burglary of the cash box, notifying the user by SMS for tampering the ATM, verify bank authority etc.

2. Centralized server based ATM security system with statistical vulnerability prediction capability

This literature paper states that there should be a security system for the ATM, which has a centralized private server for monitoring all the ATM's in a particular city. All the information regarding the security is recorded by multiple sensors and switches. Then this is processed and sent to the centralized server for the process of analysis and storage. The sensors constantly send the information obtained in order to create a strong database. Certain tests are carried to find the vulnerability, based on the data received from the servers and then a vulnerability quotient is given to all the ATM's. This acts as the central system to find the loopholes in the security systems.

3.MFCC and VQ voice recognition based ATM security for the visually disabled

The reference given by Ericson D. Dimaunahan, Alejandro H. Ballado[3] focuses on the problems face by people who are visually challenged. They use the techniques of voice and fingerprint recognition for the visually challenged to use an ATM. This two tier security system will help to overcome the issues faced by the differently abled. Four samples of the fingerprint of a user are taken and each of them is different. Once the fingerprint is recognised, the voice recognition comes into picture. Only the voice of the user in the database can be used to operate the ATM.

4. The Study for Application of ZigBee Location Tracing Mnitoring System for ATM Device Theft

Banking has become easier than before due to the technological changes that have occurred. The use of ATM cards has also increased. Increase in the number ATM's is directly proportional to the increase in thefts in the ATM. For this, Jong Min Kim, DongHwi Lee and Kuinam J. Kim[4] have presented the idea of using the Zigbee technology to easily trace the location of the ATM machine in the case of robbery.

5. Face detection based ATM security system using embedded Linux platform

The above paper proposes a smart ATM system, which is reliable and secure. In order to do so, face detection is used for providing high level of security. The OpenCV software is used in the Raspberry Pi for the purpose of image processing. The face will be detected and verified with the one in the database. The user is just given 2 chances to verify his face, followed by which the door of the ATM will be locked. To unlock the door, an OTP will be sent to the phone of the security outside the ATM using GSM. Only if the corrected OTP is entered the door can be opened else not.

6. Validating an ATM security prototype — first results

This paper proposed by Tim Stelkens-Kobsch[6] and his partners states the growing need to address threats and vulnerabilities in ATC (Air Traffic Control) since it can now be easily intruded and is therefore subject to recurrent attacks. The fact that medium between pilots and air traffic controllers still uses the general voice communication leads to the need for inventing an secure ATC communication within the scope of GAMMA -Global ATM Security Management. GAMMA is a new vision for ATM security management. ATM Security expertise from the GAMMA perspective is provided in air traffic management. This is achieved by providing an architecture and solution definition to the possible threats to ATM security.

7. Design and implementation of security based ATM using ARM11

The aim of this paper is to design and implement an economical and independent Embedded Web Server (EWS) based on ARM11 processor and Linux operating system using Raspberry Pi. Through this web server can be run on an embedded system having limited resources. Smoke and vibration sensors are used for protection purpose and their values are uploaded to the sensor. The design consists of two sides. One is at the door side with AT89S52 microcontroller and another one is inside ATM with RasberryPi.

8. Design and implementation of anti-theft module for ATM machine

This paper proposed by Prachi More and Shriram Markande[8] uses a system, which aims to design real-time monitoring and controlling system for ATM. The methodology is implemented by using RasberryPi. For security purpose, finger print sensors are used and for controlling purpose, Embedded Web Server (EWS) is designed using Raspberry Pi. This is more efficient than the existing system because in the current system ATM cards having RFID tags can be stolen and can be misused. This paper avoids the usage of any such cards.

9. Achieving Privacy and Security Using QR Code by Means of Encryption Technique in ATM

This paper by V. Malathi and B. Balamurugan[9] intends to develop an authentication system to banks that protects the asset of user's from peeping attack and secret filming. The PIN number of the user is not safe while the user is typing. ATM machine will have a QR code in which the information of the user will be encrypted .There will be one mobile application in the customer's mobile which will decrypt the encoded QR code. Information will be sent to the server and displayed in the ATM machine.

10. Smart ATM Surveillance System

This paper analyses the different forms of physical attacks on ATMs. This paper further discusses the methods that are used to detect the frauds. These include continuous monitoring of the sensors, using siren, warning and shutter locking. The siren is activated in case of attacks and designated person is alerted by SMS and call using the SIM GSM module. The proposed system thus provides more security of ATM against imminent attacks effectively

IV. LITERATURE OVERVIEW

After reviewing various papers, the needs for improving security of the ATM possess to be a major concern. The growth in the sectors of wireless technologies and sensors will assist us in developing an unbreakable system with top-notch security. This will decrease the chances of any sort of compromises in the safety of the ATM.

TABLE 1: Summary of Literature review

S.NO	TITLE	AUTHOR NAME	PUBLICATION JOURNAL/DATE	ADVANTAGE	DISADVANTAGE
1	Smart ATM security system using FPR, GSM, GPS	Bharati M Nellisani, N V Uma Reddy, Nithin Awasti	Inventive Computer Technologies ICICT, 26 August 2016	It provides a secure environment for the users throughout the session in the ATM.	A high maintenance is required as many embedded technologies used for the process of security.
2	Centralized server based ATM security system with statistical vulnerability prediction capability	T Guru Sarath	ICCE-Asia, October 2017	We deploy a central system for detecting the gaps in security amongst the ATM's in a city.	The breakdown of the centralised server can result in a halt in the functioning of the ATM's in the entire city which will be a major issue.
3	MFCC and VQ voice recognition based ATM security for the visually disabled	Ericson D. Dimaunahan, Aleiandro H. Ballado, Febus Reidi G. Cruz, Jennifer C. Dela Cruz	HNICEM, 25 January 2018	We begin by defining a model for the problems faced by the differently abled. This makes it easily accessible for them.	Accurate speech signals are needed to be recognized by VQ. Noise in the speech signals can lead to difficulty in recognizing the voice.
4	The Study for Application of ZigBee Location Tracing Monitoring System for ATM Device Theft	Jong Min Kim, DongHwi Lee, Kuinam J. Kim	ICISA, May 2012	We model an implementation of the Zigbee which helps to find the location of the cash box in case it is robbed.	The Zigbee can be turned off by the person who has done the theft to not be traced.

5	Face detection based ATM security system using embedded Linux platform	Jignesh J. Patoliya, Miral M. Desai	I2CT, 9 April 2017	We use the new technology of face detection that helps in enhancing the security system.	Since the OTP is sent to the security, any unauthorized person can try to use someone's ATM card because the ATM itself opens when the OTP is given.
6	Validating an ATM security prototype — first results	Tim Stelkens-Kobsch, Michael Finke, Matthias Kleinert, Meilin Schaper	DASC, September 2016	Overcomes the vulnerabilities of general voice communication, example insider collusion, between air pilots and air traffic controllers.	It is not economical since it includes huge cost.
7	Design and implementation of security based ATM using ARM11	D. Narmada, J. V Priyadarshini	ICICT, 26 August 2016	Various sensors are used like vibration and smoke sensors.	The latency of data transfer(alert messages)from sensor to the user may take time.
8	Design and implementation of anti-theft module for ATM machine	Prachi More, Shriram Markande	ICICT, August 2016	This paper avoids the usage of plastic ATM cards having RFID tags.	Finger print sensor proves to have many drawbacks that can hamper the system.
9	Achieving Privacy and Security Using QR Code by Means of Encryption Technique in ATM	V Malathi, B. Balamurugan, S. Eshwar	ICRTCCM, February 2017	PIN is no more prone to attacks since it is replaced by QR code authentication.	Inclusion of an mobile application may lead to data leakage by third party users and network providers.
10	Smart ATM Surveillance System	S.Shriram, Swastik B.Shetty, Vishnuprasad P. Hegde, KCR Nisha, Dharmambal. V.	ICCPCT, 2016	We have tried to cover all the possible imminent physical attacks on the ATM.	Here the usage of many hardware modules is witnessed.

V. CONCLUSION

This research paper puts forth a number of techniques to secure the integrity of the ATM. The benefits of the literature survey given above contribute mainly towards enhancing the reliability prospects. By integrating and implementing the above-mentioned techniques, an ATM system equipped with high level of authentication can be deployed.

VI. SCOPE

Witnessing the numerous fraudulent activities day by day, a reliable system is the need of the hour. The likelihood of unaccredited user trying to invade the privacy of an authorized user has to be overcome. With the help of embedded and wireless technology, we can prevent further attacks in the ATM. The upcoming enhancement in the areas of Open CV and biometric animatronics is more impregnable as compared to the current system.

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