

Transformation of ATM into Safe, Secure and Smart ATM

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Abstract: An automated or automatic teller machine (ATM), also known as the automated banking machine, is a computerized telecommunicating device. In this busy world people run out of cash with the only hope of finding an ATM machine. People know about the ATM working condition in our place without going to ATM. So GSM (Global System for Mobile Communication) is interfaced with the ATM network that can be sends all information to user's mobile. Problems like 'out of order'; 'out of cash'; 'network jam' can be well versed before stepping into ATM. It also comes with a strip of LED Light which alerts people few meters ahead, about the working condition of the ATM machine. So that next time it is not needed to waste time in stepping in, inserting our card and pin in an ATM machine which is out of order, or out of cash. In addition we must prevent the misuse of the ATM enters by the strangers while someone is using it. So we propose the idea of using the counter circuit and metal detectors at the doors to detect the weapons (knife, gun, etc) carried by the strangers and we suggest that the number of persons entering the ATM should be limited to ONE at a time.

Keywords: GSM, Door sensors, Metal Detectors, Biometric System, Password, power saving, Secure ATM, Smart ATM.

I. INTRODUCTION

A. Evolution of ATM Machine

The first modern ATMs came into use in December 1972 in the UK; the IBM 2984 was designed at the request of Lloyds Bank. The 2984 CIT (Cash Issuing Terminal) was the first true Cash point, similar in function to today's machines; Cash point is still a registered trademark of Lloyds TSB in the UK. All were online and issued a variable amount which was immediately deducted from the account. A small number of 2984s were supplied to a US bank. A couple of well-known historical models of ATMs include the IBM 3624 and 473x series, Diebold 10xx and TABS 9000 series, NCR 1780 and earlier NCR 770 series.

B. Problems in ATM Centers

ATM networks are vulnerable to many kinds of attacks and very often the possibilities are underestimated. Now-a-days the problem on using ATM center is being drastically increased due to the strangers. Due the modernization of the INDIAN culture the number of persons using the ATM for the withdrawal of money and exchange of cashes is being increased. Most of the companies pay salaries to the employees through the banking. So the security level of the ATM centers is to be improved.

C. Advantages and Disadvantages of the Existing Model

The current model of the ATM has been very successful and is been under technological advancement time by time. It uses advanced traffic management, and network

architecture for more user friendly environment on consumer and application sides. But minor problems like network jamming, out of cash, out of order, and other fundamental synopsis of problems are unavoidable.

D. Identification of the Problem

First problem in older ATM centre has less security. Unauthorized person access the account very easily, avoid that access biometric authentication are used. But the user after withdraw the amount, criminals enter the ATM attack the user and take the money. Now-a-days most of the companies pay salary to the employee through banking. So the security level of the ATM centre is to be improved. Another problem is wasting the time with not working ATM. User's enter the ATM centre insert the card and PIN then only know ATM is out of order, out of cash, printer not working problem. So the user's waste is time in his busy world and traffic jam is happened in front of ATM centre.

II. OBJECTIVES

The work was mostly designed by us through an original idea which is not used elsewhere, so we use less number of reference paper for our proposed work. This project is proposed to interface the ATM machine with a wireless GSM which displays all the information about the problems. When user call that unique number which is assigned to a GSM phone that sends all information about the ATM to user phone such as ATM out of order, ATM working, out of

balance, printer not working and also distance information. In this method ATM server's connected in centralized server. It feeds the information about ATM machine working condition and also distance information. Assign GSM number to centralized server. This server collect the nearer ATM information and give the first preference to own bank ATM. GSM sends first own bank ATM information, it is not working condition and then send nearest ATM information in a single SMS. This method is used to avoid user come to an ATM in his busy time.

It consists of using the metal detectors at the doors to detect the harmful weapons and also we suggest that number of persons entering the ATM must be limited by one. This can make the transaction safer. When number of persons is greater than one i.e (IF $N > 1$) then the keyboard and the monitor will be made inactive or if a stranger is carrying the weapon to attack the person using the ATM to get money from him/her we need help. But it is not possible to get help instantly so we fix a metal detector at the door which makes the monitor inactive and capture that person, that image is send to nearby police station by using front camera which is fixed in the entrance of the door itself.

A. Modeling the Solution for Identified Problem

In this project we use a Transmitting circuit for collecting information from the ATM network, for collecting the required data sources as an input for the external display unit (Receiving Unit). This Transmitting unit has to be interfaced with the ATM machine. As so it is complicated to work with an ATM machine, we use a microcontroller primarily for sending the input signals instead of an ATM machine. This prototype may help in briefing our idea more clearly, considering all the advantages and disadvantages of the project, including all the hardware modules and the programming codes.

B. Basic Flow Chart for 1-4 conditions of TABLE I

The following block diagram describes the process and the hardware to be used to solve the problem related to the 'Working Condition' 'Out Of Service' 'Mini Statement'.

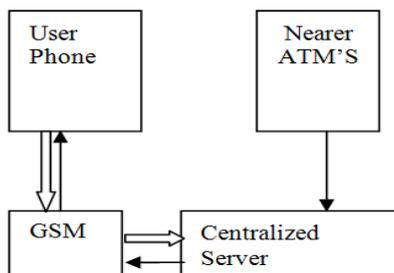


Fig.1 Flow chart for 1-4 conditions of table



Table I: Our Proposed Idea for Implementation for Different Conditions

Sl no	Condition	Display Message to Customers	Display Message to Bank
1	Enquiries about ATM with help of GSM	About ATM condition	-
2	Working Condition	Working Condition	-
3	Out of Service	Out of Service	Out of Service, Take Immediate action
4	Mini statement	Only Mini statement, No cash Withdrawal.	Out Of Cash, Take Immediate action
5	More than one person or no person in ATM (if $N > 1$ and $N = 0$) N- No. of Persons inside the ATM	Actions To Be Followed	
		ATM monitor and Keyboard will be Inactive	
6	Metal Detector	Actions To Be Followed	
		To scan the weapons (knife, gun, etc) carried by the strangers if found ATM monitor and Keyboard will be Inactive	
7	If the person not having knowledge about ATM Then,	We gave authority to the security person only. He can access the ATM by using Bio-Metric system	
8	If User Hijacked by the strangers, Use of Two Password option .	1. One For Transaction Purpose only 2. Another For creating abnormal account to withdraw minimum amount from the ATM to avoid attention of the Stranger	

III. METHODOLOGY

A. Actions to Be Followed If $N > 1$ and $N = 0$

The idea behind is allowing only one person at a time inside an ATM centre which having a single currency dispensing machine is not only to ensure the customer's privacy but also his card's security. Still, it is common to see people standing behind customers withdrawing cash from the machine at many centers. so as to avoid this type of situation we implement a idea called Switching Both the ATM display and Keyboard to be inactive by using program.

B. Metal Detector

Metal detectors based on pulse induction (PI) can be used here. Typical PI systems use a coil of wire on one side of the arch as the transmitter and receiver. This technology sends powerful, short bursts (pulses) of current through the coil of wire. Each pulse generates a brief magnetic field. When the pulse ends, the magnetic field reverses polarity and collapses very suddenly, resulting in a sharp electrical spike. This spike lasts a few microseconds (millionths of a second) and causes another current to run through the coil. This

subsequent current is called the reflected pulse and lasts only about 30 microseconds. Another pulse is then sent and the process repeats. A typical PI-based metal detector sends about 100 pulses per second, but the number can vary greatly based on the manufacturer and model, ranging from about 25 pulses per second to over 1,000.

If a metal object passes through the metal detector, the pulse creates an opposite magnetic field in the object. When the pulse's magnetic field collapses, causing the reflected pulse, the magnetic field of the object makes it take longer for the reflected pulse to completely disappear. This process works something like echoes: If you yell in a room with only a few hard surfaces, you probably hear only a very brief echo, or you may not hear one at all. But if you yell into a room with a lot of hard surfaces, the echo lasts longer. In a PI metal detector, the magnetic fields from target objects add their "echo" to the reflected pulse, making it last a fraction longer than it would without them.

A sampling circuit in the metal detector is set to monitor the length of the reflected pulse. By comparing it to the expected length, the circuit can determine if another magnetic field has caused the reflected pulse to take longer to decay. If the decay of the reflected pulse takes more than a few microseconds longer than normal, there is probably a metal object interfering with it.

If we caught the person by sensing we made ATM display and Keyboard to be inactive by using Programming code and capture the person using entrance camera and they send to nearby police station.

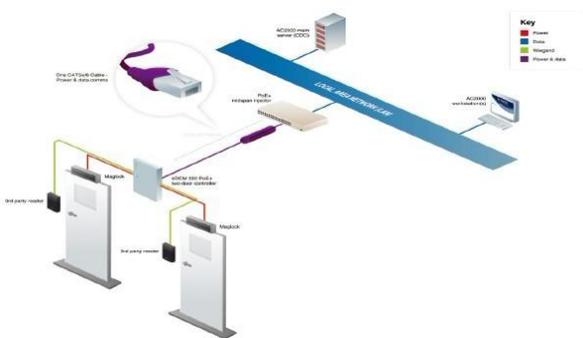


Fig.2 Block diagram showing the interfacing of door and monitor
The interfacing process is carried out with the circuit shown above. It consists of the metal detector fixed with the door which is being interfaced with the computer monitor and the keyboard.

C. Use of Bio-Metric System

In addition to all these securities we can use the bio- metric sensor in addition to the metal detector circuit to increase the safety level in the ATM. If user is not well educated or not aware about ATM means at that time, We gave authority to the security person only to help the customer. His Bio-Metric is fed by a bank Authority.

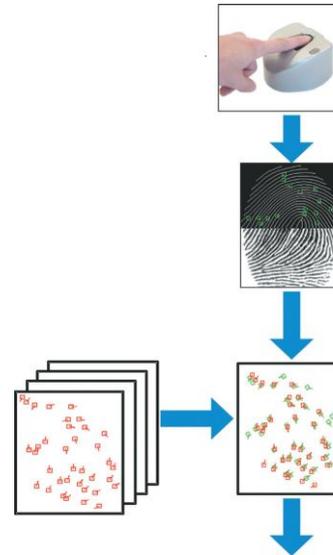


Fig.3 Use of bio-metric system

D. Door Sensor

A sensor is attached to the door to count the number of persons entering the ATM at a time. If the number of persons entering the ATM is more than one the monitor and keyboard become inactive and lights will be off. When card inserted into ATM machine the door will be automatically closed and finishing all his transaction the door automatically opens. Uneducated person will get help from the security. Security enters into the ATM by using biometric fingerprint that time only two persons allowed. Otherwise only one person allowed in ATM centre that time the keyboard, monitor, and one light will be on. It is also for the power saving purpose and security. Transaction the door automatically opens. Uneducated person will get help from the security. Security enters into the ATM by using biometric fingerprint that time only two persons allowed. Otherwise only one person allowed in ATM centre that time the keyboard, monitor, and one light will be on. It is also for the power saving purpose and security.

E. Two Password System

Till now our government providing Single password for transaction, we had an alternate idea, by issuing two password for two different purpose. One For Transaction Purpose only and another password is used in emergency time. For example user is hijacked by the stranger and asked to take money from the ATM, here in this situation user as to use second password, after entering the password money 5000 in original account transferred to second abnormal account in $M > 5000$ condition (M -Money in user account). In this second upto 24 hours these account should be access for security. After 24 hours using the abnormal (second) password again transferred 5000 to abnormal account only emergency time. Suppose user have less than 5000 that time access original account in $M < 5000$ condition. Otherwise we

use first password for normal transaction. It is implemented in ATM security is much improved.

IV. CONCLUSION

Advantages of this Project are more secure and protect the privacy and confidential information. Time saving, user friendly. It can be easily interfaced with any ATM machine and can be upgraded for future progress. Helps people to avoid getting into a jammed ATM machine at times of busy schedule, or at traffic road junctions. It makes the use of the ATM in safe and secured way. Future scope of this project has over viewed the process of notifying the process and service of the ATM machine in advance to solve the present fundamental problems.

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BIOGRAPHY



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