Implementation of Hi-Tech ATM Security System

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Abstract : It is observed that the numbers of crime related to ATM is increasing day by day so there is need to provide better security to ATM machines .In our survey paper we are proposing a technique by using sensors like RFID ,Gyroscope ,Vibration sensor and Servo Motor by which any theft activity found in ATM system can be detected and caught red handed. Compare with the traditional theft control system realizes Hi-Tech ATM security is the advance way to avoid this kind of activities. We design a self-security which automatically informs the authorities as soon as it detects the suspicious activity. The sensors detect the activity and take the absolute measures to avoid robbery. It is provided with many advantages and takes quick reaction.

Key Words: ATM, RFID, Gyroscope, Vibration Sensor, Servo Motor.

I. INTRODUCTION

The numbers of robberies are increasing day by day and have been a great challenge put in front of public and concerned agencies like banking sectors. Today banking sector is one of the most important parts of a human day to day life. Banking facilities grow faster so people used these facilities for their economies activities. ATM (Automatic Teller Machine) is one of a facility which is provided by the bank to the customer. ATMs are located in different places and the customers can make basic transactions without the help of bank staff, due to this use of the ATM machine increase widely as shown in Fig.1. In Fig. 1, shows that in the year 2014 use of ATM machine is less as compared with the year 2016. In the year 2019, the use of ATM increases all most 75% with respect to the year 2016.The customer can access their bank account from ATM system using a PIN number which provided to the customer from bank. This PIN number is totally confidential. Crime related to ATM increases day by day. Fig.2 shows a graph of ATM frauds which increases widely. The crime which is happening in ATM becomes a serious issue so ATM security also a serious issue.

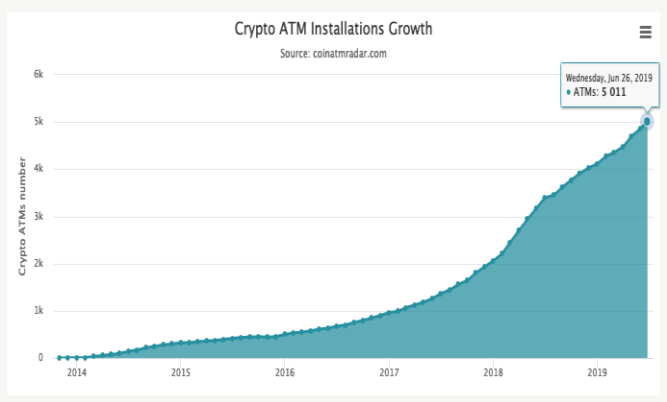

Fig 1. ATM Growth

Once the card of the customer is lost and PIN number is known hacker can withdraw all the money in a short period. So to avoid ATM related frauds there are various methods to provide security to withdraw money and detect any illegal activity.
To provide a security to a transaction or to identify where the person is authorized or not various methods are introduced in ATM system. Many times thieves try to take the ATM Machine with them or try to damage the machine using some tools like hammer for stealing of money. These activities can be handled by considering some technologies which is GSM Module for sending the messages to the police station or the banking sector for any fraud detection and the other one is the Shutter Technology which makes use of servo motor and Gyroscope by interfacing them. When the robber tries to do these illegal activities in ATM system the shutter gets closed from outside. The main work focused on Shutter technique to provide enhanced security to ATM while GSM based technique is also implemented for the same purpose. This system uses a combination of the both techniques. In hi-tech security system there are various sensors used like Gyroscope, RFID Tag, RFID Reader, Servo Motor and GSM Module which have been designed to enhance the security of ATM.in this paper we have developed an affordable and reliable system using Arduino.

II. PROBLEM STATEMENT

The purpose of project is to provide Hi-Tech security to the ATM Machine which will protect the ATM from theft activity.
The objective of project is to provide more security by using GSM, Gyroscope to ATM system. Inform the local police and bank authority to caught the thieves red handed.

III. SYSTEM ARCHITECTURE

A. *System Description*:

In this project we are using an Arduino Uno. When the robbery is held in ATM security system there can be two possibilities by which stealing of cash could be done. One way is that the robber may try to damage the system and use some tool like hammer to break it, at that time vibration sensor will detect vibrations and will generate output for servo motor which will help the shutter to shut down.

At the same time the message will be sent with the help of GSM module to the nearest police station or the banking sector.

The second possible way is that robber may try to take the whole ATM system with himself. In that case ATM machine has Gyroscope sensor which is placed on the top of the machine and if any severe moment is detected in the machine that is if the Gyroscope having X,Y and Z axis. Any of the axes gets deflected from its position the output to servo motor will be sent and the shutter will get locked.

Along with that a message will be sent to nearby police station or the banking sector.

Also if these both illegal practices are occurred at the same time the message will be sent and also the shutter will be closed till the police or people from banking sector reaches that place.

The RFID tag and RFID card reader is used for the authentication purpose so that the person from banking sector can stop the security system of the ATM machine for the transfer of money in ATM machine and for that purpose the threshold value is set .in that fixed given time the money should be deposited otherwise the machine security system gets activated.

Using the RFID tag which is only accessible by the banking sector person can stop the system which is read by the RFID reader in the ATM machine.

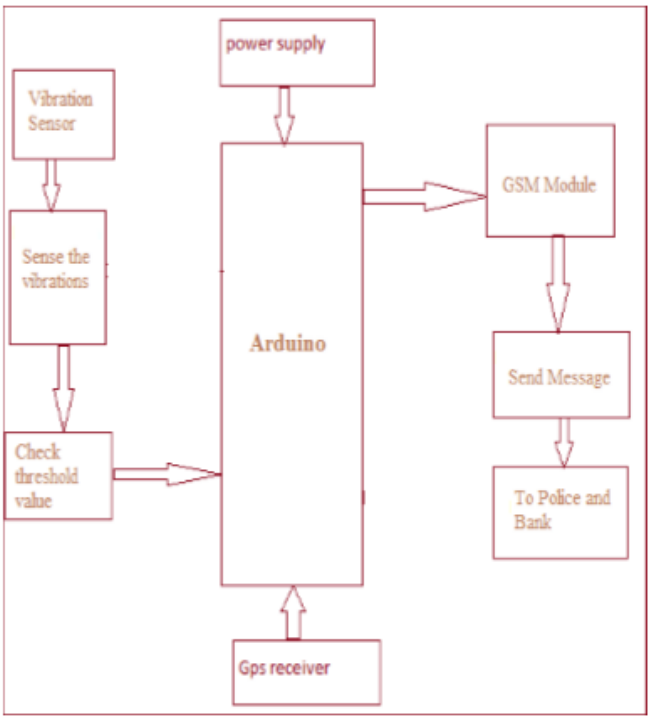

Fig2. Block Diagram

IV. RESULT

Fig3. Hardware Setup

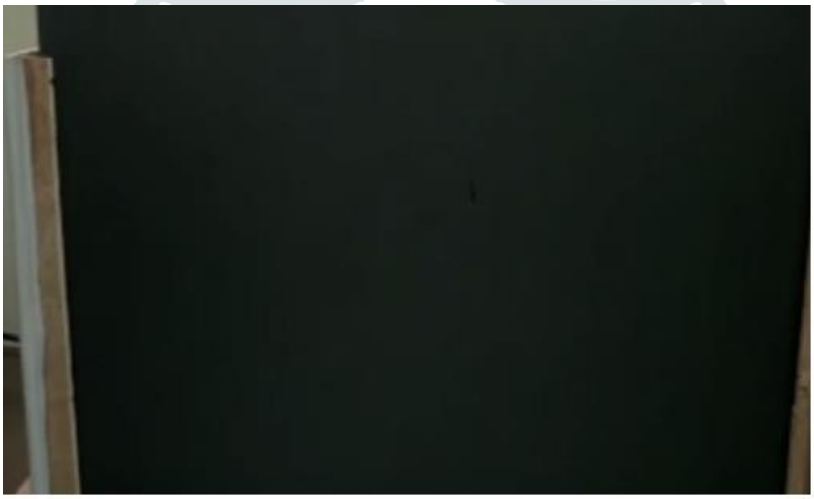

Fig4. Any unwanted activity detected then close ATM

V. CONCLUSION

Many times thieves try to take the whole ATM machine with them or try to damage the machine using some tools like hammer for stealing of money. These activities can be handled by considering some technologies which is GSM module for sending the messages to the police station and the banking sector for any fraud detection and the other one is shutter technology which makes use of servo motor and Gyroscope by interfacing them. When the robbers tries to do these illegal activities in ATM system the shutter of the ATM get closed from outside. The main work focused on shutter technique to provide enhanced security to ATM while GSM based technique is also implemented for the same purpose. This system uses a combination of both techniques. In hi-tech security system there are various sensors used like Gyroscope, RFID Tag, RFID Reader, Servo motor and GSM module which have been designed to enhance the security of ATM. In this project we developed an affordable and reliable system using Arduino. Securities provided by previous technologies are less significant and allowing frauds at ATM. There is a need to add some extra features in previous technology to enhance ATM security. GSM technology and shutter implementation is more secured than previous ones and provide high performance with hi-tech security system.

VI. FUTURE SCOPE

To continuously avoid robbery and suspicious activity in ATM. To avoid loss of cash in ATM and time to find cash after robbery. Can further be improved to avoid accident by adding more sensor to existing system and programming it.

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