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Smart ATM Security Using Iot

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Abstract
The Idea of Designing and Implementation of Security Based ATM theft paper is born with the observation in our real life incidents happening around us. This paper deals with prevention of ATM theft from robbery and unauthorized transactions. So overcome the drawback found in existing technology in our society. The proposed system provides biometric registration for entering into ATM rooms just to store the biometric details of the person who entered the ATM room. In case of robbery the biometric details are useful. In this system we can also improve the security for the ATM pin by using Buzzer, Location sharing, Sending notification and Door locking system. MEMS sensor is used here which senses vibration produced from an ATM machine and also provides fire alarms. This system uses ARDUINO controller platform based embedded system to process real time data collected using the sensors. Once the any abnormal condition or unauthorized is sensed the voice alerts will occur from the system. Servo Motor is used for closing the door of ATM. Spray mechanism is used to leak the gas inside the ATM to bring the thief into unconscious stage. And send the robbery occur time with the message to the nearby police station and corresponding bank through the IOT. Hear LCD display board using showing the output of the message continuously. The proposed system also provides the ATM Status to the customers smartly by indicating the RED and GREEN signals

Keywords: IOT,MEMS Sensor, ARDUINO, Spray mechanism

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I. Introduction

An automated teller machine (ATM) is an electronic telecommunications device that enables customers of financial institutions to perform financial transactions, such as cash withdrawals, deposits, funds transfers, or account information inquiries, at any time and without the need for direct interaction with bank staff. ATMs are known by a variety of names, including automatic teller machine (ATM) in the United States (sometimes redundantly as "ATM machine"). In Canada, the term automated banking machine (ABM) is used, although ATM is also very commonly used in Canada, with many Canadian organizations using ATM over ABM. In British English, the terms cash point, cash machine and hole in the wall are most widely used.ATMs can be placed at any location but are most often placed near or inside banks, shopping centers/malls, airports, railway stations, metro stations, grocery stores, petrol/gas stations, restaurants, and other locations. ATMs are also found on cruise ships and on some US Navy ships, where sailors can draw out their pay [1].An ATM is used by people for making transactions. The transaction can be cash deposits and withdrawal, transferring money, balance enquiry and many more. To use an Automatic Teller Machine (ATM), a plastic smart card is provided by the bank to the cardholder. This smart card contains a magnetic black stripe on the back of it which contains the specific information (unique card number and some other information) of the user. Along with the smart card, a PIN code is also provided to the cardholder by the bank to access the account. A PIN is a 4- digit number which is generated by the bank. Each cardholder has a unique PIN code. The PIN can easily be remembered by the user and if needed, it can also be changed by the cardholder. The PINs are 4 digit numbers and have a range from 0000-9999 resulting in 10000 possible numbers. The customer is identified by inserting a plastic ATM card and entering a personal identification number (PIN) for the customer. ATM allows customers to access their bank accounts and enable them to deposit and withdrawal processes as well as check their account balances and enable them to use their mobile phones to buy prepaid credit. Also, an automatic teller machine allows a bank customer to conduct their banking transactions from almost every other ATM machine in the world. The number of entering the password is restricted to 3 only. In the existing system firstly the user inserts his card and the PIN

number. If the PIN number is correct, then the system allows the user to perform the transactions. If the PIN is not correct then the system will again ask the user for a PIN and it allows a maximum of three times to enter the PIN. If an incorrect PIN is entered for the third time, the card gets blocked and retained by the ATM. In an event where the user fails to authenticate to the bank system, the bank card will typically be blocked and also confiscated by the ATM. If the user were to be a fraudster, confiscating the bank card would prevent the fraudster from further guessing the correct PIN and subsequently withdrawing from the card owner's account via the ATM. However, in a situation whereby the fraudster is in possession of both the bank card and correct PIN, there is no way of preventing such withdrawals via the existing ATM machine [4-5].

ATM Networking: The internet service provider (ISP) also plays an important role in the ATMs. This provides communication between ATM and host processors. When the transaction is made, the details are input by the card holder. This information is passed on to the host processor by the ATM machine. The host processor checks these details with authorized bank. If the details are matched, the host processor sends the approval code to the ATM machine so that the cash can be transferred.

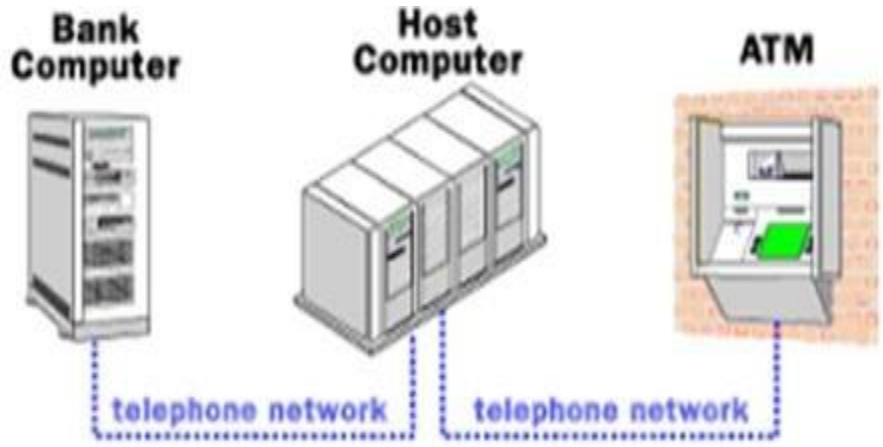

Fig.1.1: *ATM Machine Network*

ATM allows customers to access their bank accounts and enable them to deposit and withdrawal processes as well as check their account balances and enable them to use their mobile phones to buy prepaid credit. Also, an automatic teller machine allows a bank customer to conduct their banking transactions from almost every other ATM machine in the world. The number of entering the password is restricted to 3 only. In the existing system firstly the user inserts his card and the PIN number. If the PIN number is correct, then the system allows the user to perform the transactions. If the PIN is not correct then the system will again ask the user for a PIN and it allows a maximum of three times to enter the PIN. If an incorrect PIN is entered for the third time, the card gets blocked and retained by the ATM[6]. In an event where the user fails to authenticate to the bank system, the bank card will typically be blocked and also confiscated by the ATM. If the user were to be a fraudster, confiscating the bank card would prevent the fraudster from further guessing the correct PIN and subsequently withdrawing from the card owner's account via the ATM. However, in a situation whereby the fraudster is in possession of both the bank card and correct PIN, there is no way of preventing such withdrawals via the existing ATM machine [2-4].

II. Present work

In present scenario, ATM has become one of the most important facilities in our day to day life. This facility enables us to withdraw the money from the authorized account at any time. Security is the major aspect, as the need of ATM is increasing day by day. Security systems are the demands of the day, which helps to avoid theft. Although the banks are deploying security personnel at the ATM spots, but the security arrangement is not quite good enough to secure the facility in case a group of thieves tries to stole the ATM machine. Recently we have seen many cases wherein a group of people entering into ATM and overpowering the security personnel and stole the money from the ATM. Generally a single person is unable to handle the gang of robbers. Thus an automatic security system plays very important role to avoid robberies.

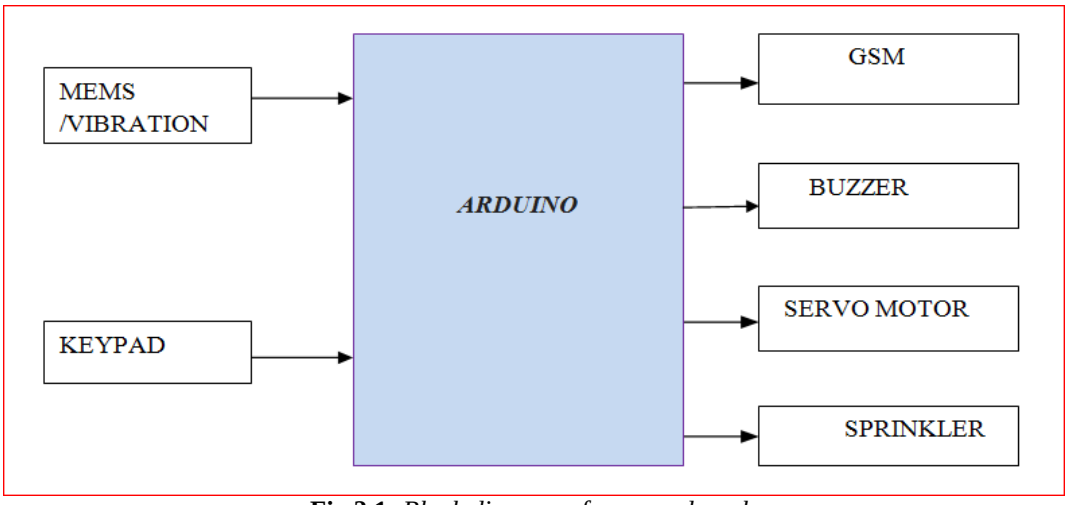

Fig.2.1: *Block diagram of proposed work*

The Idea of Designing and Implementation of Security Based ATM Security Alert project is born with the observation in our real life incidents happening around us. In this project we are going to design system that will help in catching the thieves when an attempt is made to stole the ATM. This system will also act as a security barrier for the ATM facility. The proposed work consists of an idea of implementing Vibration Detection sensors. These sensors will generate a signal whenever someone tries to forcefully open or damage the ATM machine. After detection of such signal immediately an SMS will be sent to the authorized person of the bank, making him/her aware of the situation. Also we are using a wireless camera, so that in such cases, authorized person can have a live footage of the ATM facility onto his/her mobile phone. In this work, we are offering more security for ATM machines and also to identify the robbery quickly by implementing an embedded system. Whenever someone tries to make damage or want to lift the ATM machine from its place, automatically vibration sensor attached to the ATM machine will be activated and sends a signal to controller. Once the controller receives signal, it locks the door of ATM by the rotation of motor, and send a message to concerned authority about the theft occurring through GSM modem. After this the sprinkler (DC Pump) installed inside the ATM will get activated and it will spray the chloroform chemical to make the person unconscious and at the same time buzzer will be activated[8]. When the wrong pin entered for the first time buzzer will beep and message will be sent to the account holder. When the wrong pin is entered for the second time intimation through voice module can be observed. When the wrong pin is entered for every third time automatically doors will be closed by using servo motor. And also message will be sent to the account holder; on the other hand if any tilt is occurred in ATM machine then spray mechanism will be activated. It can also provide the status of ATM machine by providing red and yellow signals. It can be shown below flow chart

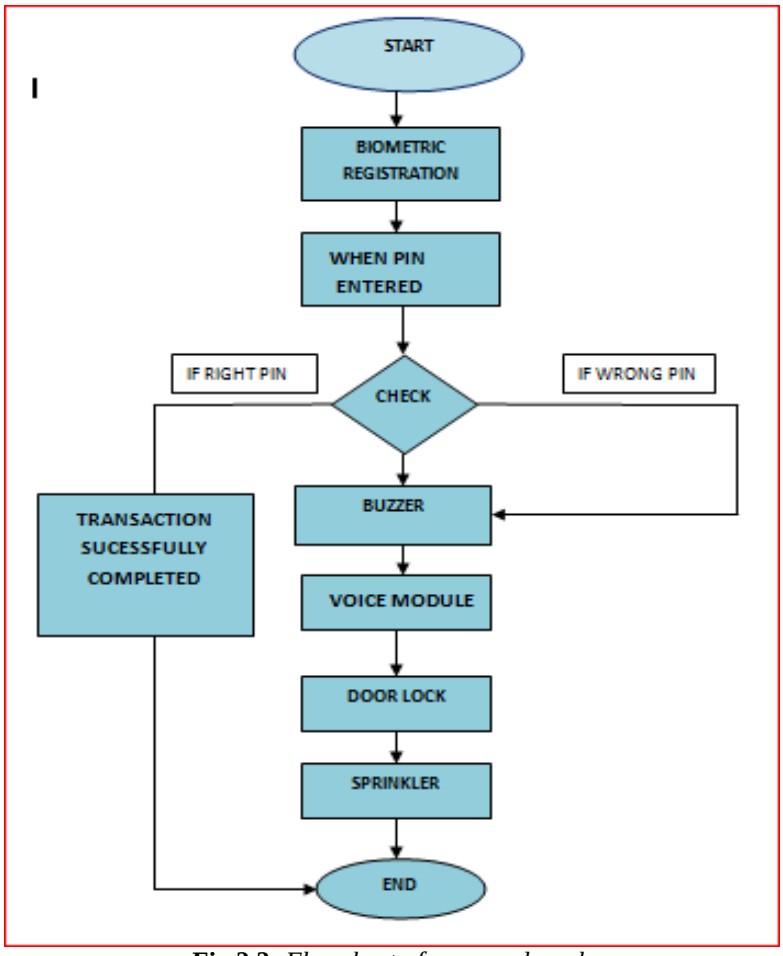

Fig.2.2: *Flowchart of proposed work*

III. Experimental Results

According to the observations, results show that the robustness of presented work and appropriate results shown below.

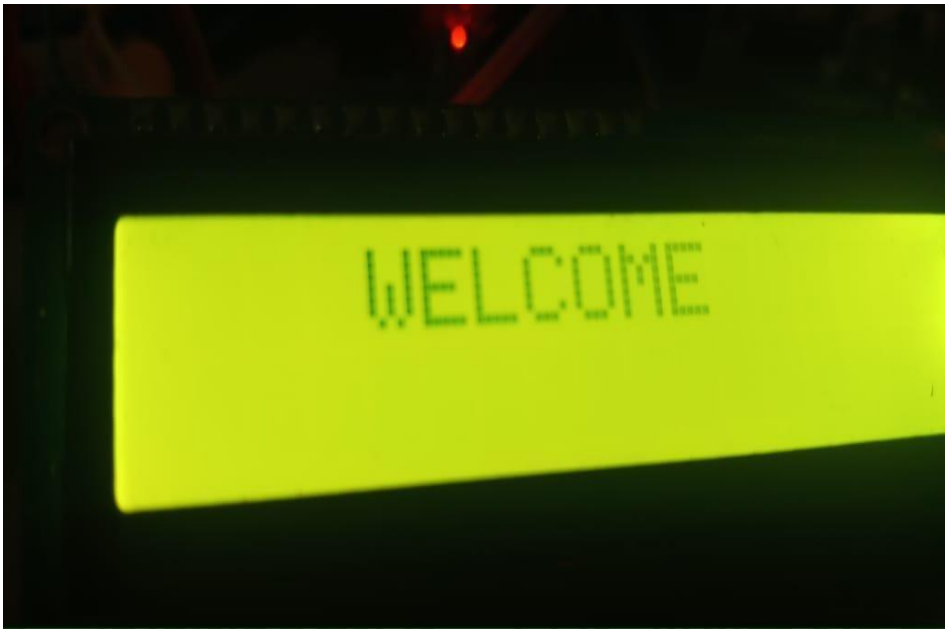

Fig3.1: *WELCOME message displaying on LCD display before entering the ATM.*

Fig 3.2*: Display showing the command for scanning the finger*

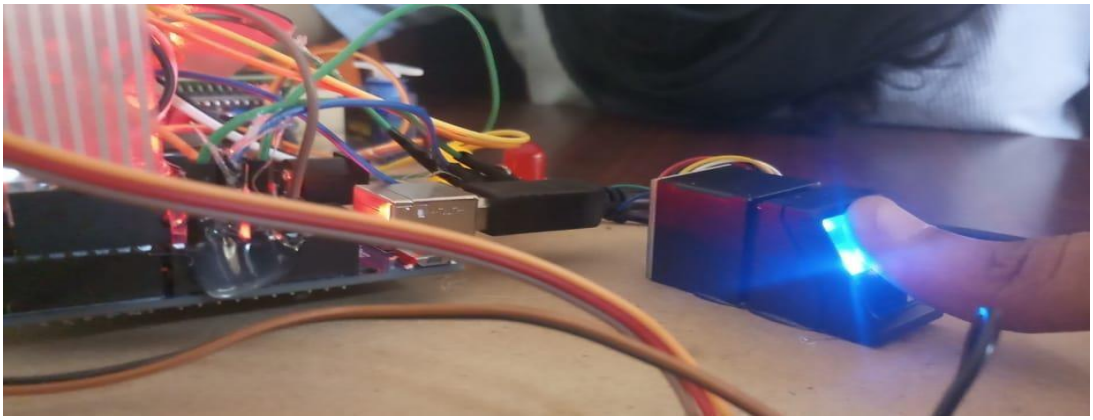

Fig 3.3*: Picture showing the command for scanning the finger*

Fig 3.4*: After successfully scanning the finger*

Fig 3.5*: Door opened for entering the ATM after scanning finger*

Fig 3.6**:** *Display showing the command for entering the password.*

Fig 3.7**:** *Entering password through KEYPAD*

Fig 3.8**:** *Display showing WRONG PASSWORD1 after entering the wrong password for the 1st time.*

Fig 3.9*: *Display showing WRONG PASSWORD2 after entering the wrong password for 2nd time.

Fig 3.10*:* *Display showing WRONG PASSWORD3 after entering the wrong password for the 3rd time.*

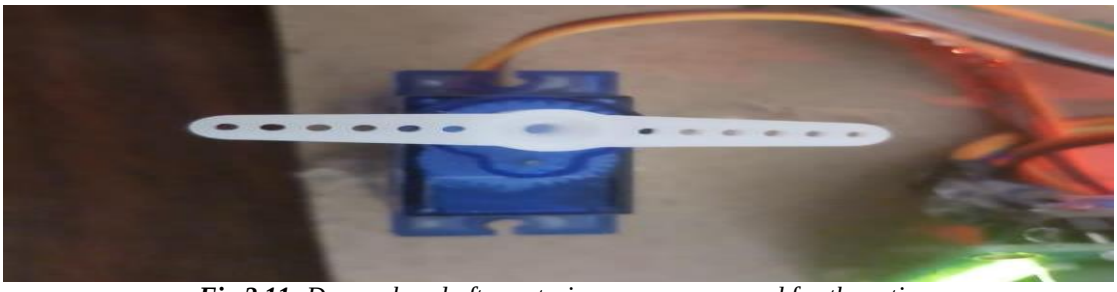

Fig 3.11*: *Doors closed after entering wrong password for three times.

Fig 3.12*: *Image of the sprinkler which sprinkles the spray after entering the password for the 3rd time.

Fig 3.13*: *Image of the buzzer which gives a precautionary beep after entering the password for 1st time.

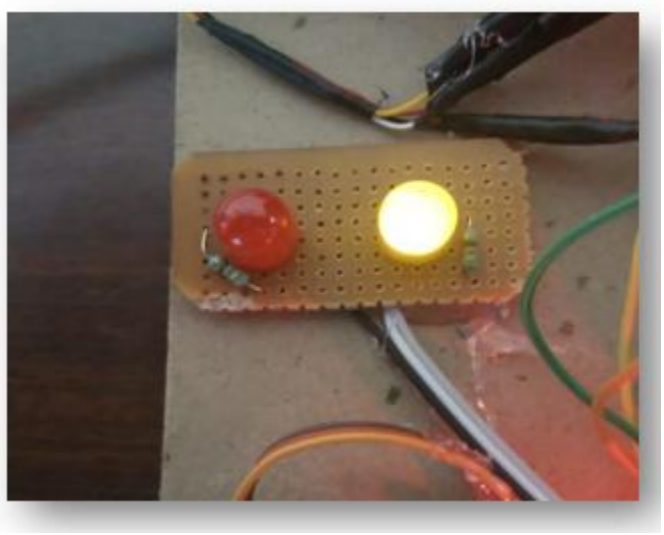

Fig 3.14*: *Image shows the LEDS lights where are used to show the status of the ATM machine. Here YELLOW lights indicate that the ATM machine is in working condition.

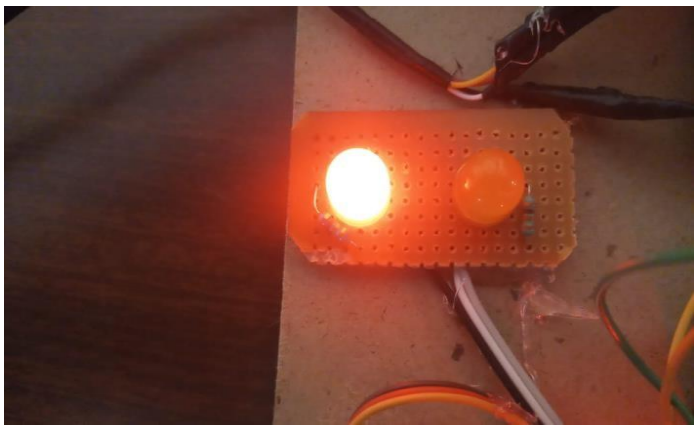

Fig 3.16*: *Image shows the glow of RED light which says that ATM is out of order.

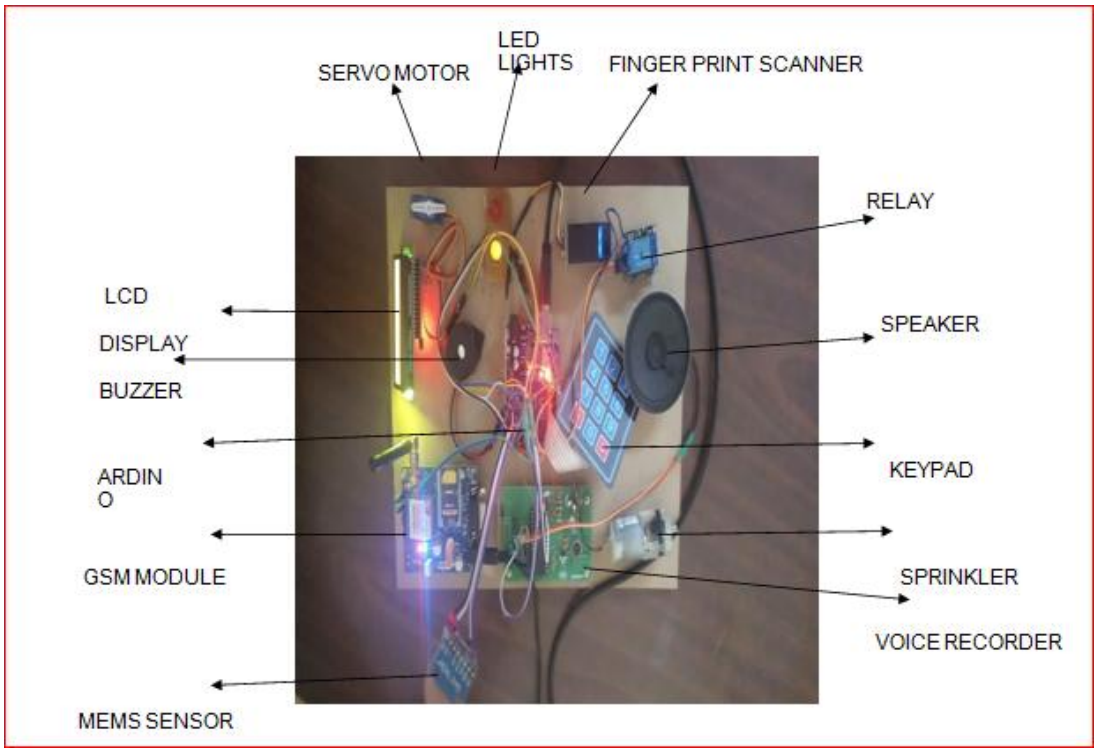

FIG3.17: *Overall Circuit of the Proposed Work*

IV. Conclusion

Based on the results obtained, the objective of implementing ATM security system using GSM & vibration sensor has been achieved. This project is used to provide security to ATM. Whenever a person tries to distract the ATM, the sensor which senses the vibrations & send a signal to the microcontroller. Once the controller receives signal, it locks the door of ATM room by sending signal to the dc motor and sprinkler sprinkles the chloroform to make the thief unconscious. At the same time, the buzzer also gets activated. Simultaneously, the controller will provide the status of ATM machine whether it is working or out of order with the of the YELLOW and RED LED lights.

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