

Novel Implementation of Anti-theft ATM Machine using ARM

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ABSTRACT : Automated Teller Machines (ATMs) security is the field of study that aims at solutions that provide multiple points of protection against physical and electronic theft from ATMs and protecting their installations. ATM video surveillance cameras and ATM monitoring security system is proposed in this method. The design is made with the use of Machine-to-machine (M2M) communications technology. M2M communications is a topic that has recently attracted much attention. It provides real-time monitoring and control without the need for human intervention. The aim of the proposed work is to implement a low cost stand-alone Embedded Web Server (EWS) based on ARM7 processor. It offers a robust networking solution with wide range of application areas through GSM. The GSM communication is used to send message to the nearby police station if any unknown person enters in to ATM. The setup is proposed for ATM security, comprising of the modules namely, authentication of shutter lock, web enabled control, sensors and camera control.

Keywords : M2M, GSM, ARM7

I. INTRODUCTION

The rapid growth in Automatic Teller machines (ATM) has made life easy for the day to day man, but it is not so for operators who manage it. ATMs are not owned by banks; rather they are outsourced to managed service Providers (MSPs) from purchasing to maintaining the machines. Several factors like the maintenance, money

Filling, security and therefore the passive assets within the ATM rooms are responsible for keeping the ATM active [3]. Typically, an ATM site consists of anywhere between 8 to 12 passive assets which include two air conditioners, two light collection boards, Associate in Nursing inverter/UPS, a security camera and a minimum of eight to twelve lightweight bulbs. Currently, since the security and passive assets in ATM rooms are managed manually, it ends up in larger physical interaction, that increase the time period and therefore shrinks the gross margin of ATM operators. These MSPs are duty-bound and every ATM site is up as costs of downtime are too high. With rising overheads ATM operators struggle to pass on the cost and so are looking for a reliable remote monitoring solution to revitalize ATM maintenance.

1. MACHINE TO MACHINE COMMUNICATION

Machine to Machine (M2M) refers to technologies that allow both wireless and wired systems to communicate with other devices of the same type [1]. M2M may be a broad term because it does not pinpoint specific wireless or wired networking, information and engineering. M2M is considered an integral part of the Internet of Things (IoT) and brings many edges to industry and business in general as it has a wide range of applications like industrial automation, logistics, Smart Grid, sensible Cities, health, defense etc., largely for observation however conjointly for management functions.

2. M2M Architecture

M2M can include the case of industrial instrumentation -comprising a device (such as a sensor or meter) to capture an event (such as temperature, inventory level, etc.) that is relayed through a network (wireless, wired or hybrid) to associate degree application (software program) that interprets the captured event into substantive information (for example, things ought to be restocked). Such communication was originally accomplished by having a foreign network of machines to relay information back to a central hub for analysis, which might then be rerouted into a system like a personal computer. The machine to machine communication in ATM has a

great impact on building a powerful Security Based ATM theft monitoring system. However, there are many challenges in the design of the M2M communications network whereby this 2015 International Conference on Circuit, Power and Computing Technologies [ICCPCT] project deals with prevention of ATM theft from robbery. Sensor based network has been extensively used in monitoring and controlling purposes in ATM [2].

II. IMPLEMENTATION

The Idea of Designing and Implementation of Security Based ATM theft is born with the observation in real life incidents. This paper deals with prevention of ATM theft from robbery .To overcome the drawback found in existing system an innovative method is proposed in this paper. Fig 1 shows the overall implementation of system.

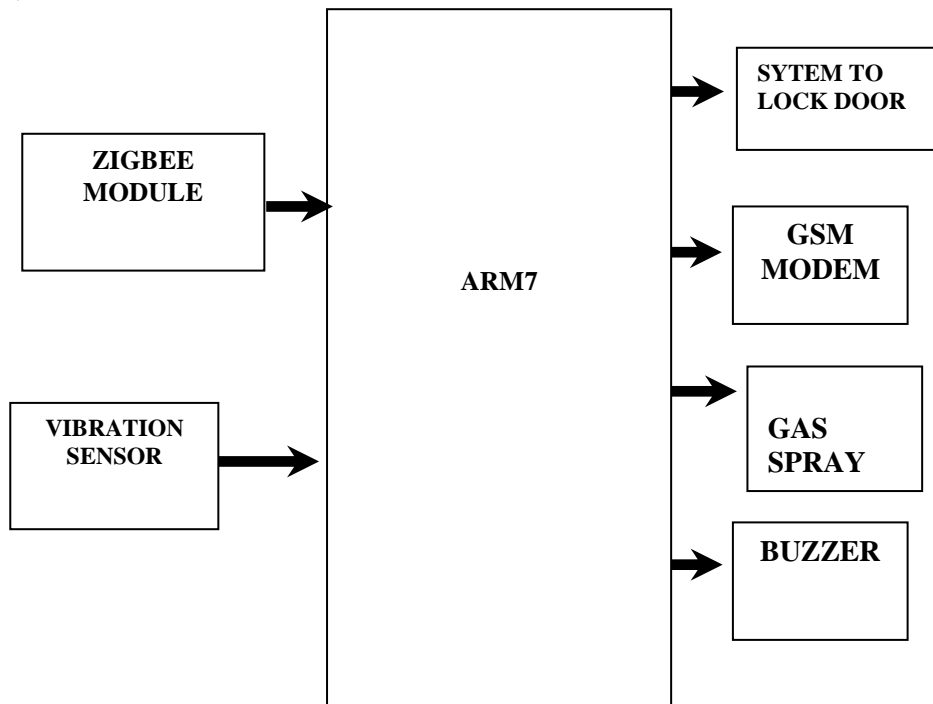


Fig 1: Over all implementation of project

GSM module is interfaced in this system so that when theft occurs the message is passed automatically to nearby police station. When robbery occurs, Vibration sensor senses vibration produced from ATM machine and sends command to the ARM processor through Zigbee module. Then accordingly the action is taken. This system uses ARM7 controller to process real time data collected using different sensor. Once the vibration is sensed, information is passed to ARM7 based master device over zigbee channel. In this paper buzzer sound is used to notify the persons regarding theft. Motor setup is used for closing the door of ATM. Gas spray is triggered to leak the gas inside the ATM to bring the thief into unconscious stage. The message is send to corresponding bank through the GSM. This will prevent the robbery and the person involving in robbery can be easily caught.

1.SHUTTER LOCKING SYSTEM

RFID reader is placed on the outside of the ATM shutter and it is separated from the main controller unit. When controller receives serial data from the Reader it controls the shutter lock or unlock. When the card is brought near to the RFID module it reads the data in the card and displays on the LCD. The data in the card is compared with the data in the program memory and displays authorized or unauthorized message. The door opens for a licensed person, closes for associate unauthorized person. The overall process is explained in figure 2.

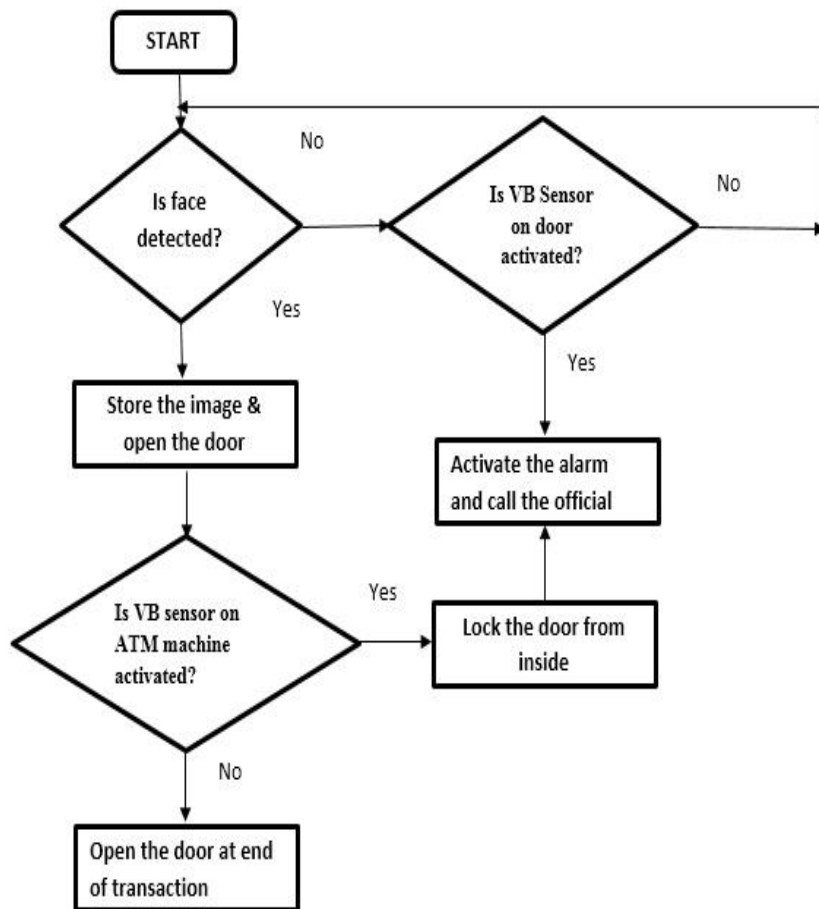


Fig 2. Flowchart of the entire process

2.M2M DRIVEN ATM SITEs

The only solution to the above mentioned security problems are resorting to M2M technology. Banks can specialize in the safety of its client as they are of supreme interest, by implementing remote observance resolution across their ATM sites to resolve security problems. M2M put in ATMs are able to provide handiness, security, cut back field service visits, minimize system downtimes and minimize operative prices. Operators are directly alerted once a haul happens, and is able to resolve the threats in real time from a distant location. In case of physical attacks, vibration sensors put within the machine raises associate degree alarm and intimate the operator on breaking, drilling, or cutting of the safe area unit dispensed. Additionally anonymous closure of ATM shutter or any physical attacks on the patron is captured to boost alarm to the general public, and additionally to the closest police headquarters. Apart from the protection, M2M assists the operators to beat different bottlenecks mounting on them like energy management, fault management, rising operative prices, and news. Optimized utilization of infrastructure, continuous network period of time, and reduced operative prices maximizes revenues for ATM operators are also provided. Smart ATMs add location intelligence and enhances observance visually by desegregation Google map. It allows integrating Google Maps and placing the sites on the maps in step with the geographic distribution. The site status of a site can be viewed during a popup by clicking on the positioning balloons on the Google Map [3]. Furthermore the site location on this popup redirects to site exposure page containing sensing element standing, power supply, power consumption pattern, etc.

III. RESULTS AND DISCUSSION

Security and passive assets in ATM rooms are managed manually and it ends up in larger physical interaction, that increase the time period and therefore shrinks the gross margin of ATM operators. These MSPs are duty-bound to create certain that every ATM site is up as costs of downtime are too high. With rising

overheads ATM operators struggle to pass on the cost and so are looking for a reliable remote monitoring solution to revitalize ATM maintenance. The proposed work implements a secure way of accessing an ATM by authorized persons alone in terms of monitoring the ATM using hardware and the above said module is accomplished by using RF Modules, RFID Reader. For closing the ATM door, DC motors area unit is used which are operated by 12VDC power provide. In any motor, operation is predicated on straightforward electromagnetism. A current carrying conductor generates a magnetic flux; once and to the strength of the external magnetic field. A DC Motor is placed here for authorized closing the ATM door. The GSM module is shown in figure 3. Zigbee module is shown in fig 4. Fig 5 shows the ARM7 module interfaced in this paper.



Figure 3 :GSM module interfaced

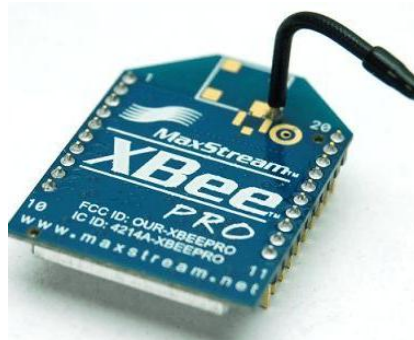


Figure 4: zigbee module



Figure 5 :ARM Module

IV. CONCLUSION

In this paper a novel method of anti-theft system is designed to prevent theft in ATM machine. The module is interfaced with zigbee , GSM and ARM7 processor. The system can be used in realtime ATM machine to block the person from theft. GSM is interfaced to send message to nearby bank and nearby police station.

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