DESIGN AND IMPLEMENTATION OF SECURITY BASED ATM THEFT MONITORING SYSTEM

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Abstract—now a days the increased threat encountered by customers and ATM machine. The ATM center goes to the danger zone .the present day monitoring system is most popular which turn to encourages the fraud ,crime & unknown activities in ATM center. This is high-time for the government and banking sector to join hands to weed out this adversity in security system. so it becomes essential to strictly monitor the do's and don'ts inside the ATM center, very specifically the facial recognition is considered to authenticate the entry of any individual inside the ATM center, it is achieved by employing identifier technique .As an additional features, a combinational biometry system is used to access the ATM machine .The entire security module is combine with an easily detect the unknown activity and vibration sensor cum alarm, which alerts the nearest police station as well as the bank security wing ,ensuring immediate defense to the victims including strong physically challenged people .this overall system proves to be an autonomous ,continuous and secured surveillance system

Index Terms— Raspberry pi 2, Vibration Sensor, GSM Technique, DC Motor, Buzzer, Raspbian OS, ATM center, webcam.

I. INTRODUCTION

In today's technically advanced world, autonomous systems are gaining rapid popularity. As the social computerization and automation has been increased and the ATM and credit card has been installed and spread out to simplify the activity for financial activity, the banking activity has been simplified, however the crime related with financial organization has been increased in proportion to the ratio of spread out of automation and devices. Among the crime for financial organization, the cases of theft and robber have very high proportion of over 90% and the crime for the ATM has been increased because the external ATM has been increased and it is always exposed to the crime. Therefore, this study is going to suggest the method of rapid reaction and minimization of loss by detecting the ATM machine at real-time when it has been stolen can be found through GSM technology. So by using the GSM technology, Vibration sensor, DC Motor, Stepper Motor theft of external ATM machine can be predicted. In this project we are using buzzer to give signal for corresponding bank and police station. Camera is used to take the continuous video clips.

II. BLOCK DIAGRAM

Functional Block diagram of proposed system in which how the Raspberry pi 2 is interfaced with vibration sensor, GSM Modem, DC Motor, buzzer, webcam, internet connection.
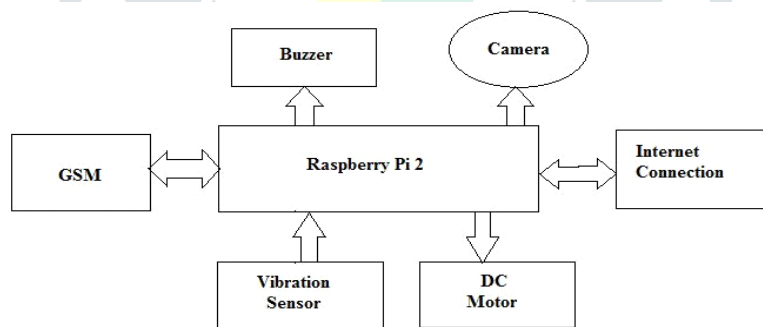

Fig.1.Block Diagram

III. RELATED STUDY

1. ATM (Automated Teller Machine):

The first ATM in Korea was installed by Korea exchange Bank in 1975, and after   installation of ATM by Shinhan Bank in 1982, the civilian can use the ATM of various banks with Starting of operation of common CD network which is controlled by Korea financial telecommunications & clearings institute. The number of installed ATM machine has shown the trend of increasing continuously with the high increasing ratio in the first half of year 2000s, and gradual increase after the year. Especially external ATM machine has been increased continuously.

The external ATM machine is located in the entrance of kiosk booth and sidewall generally. The security system of those external ATM protects the 1st stage with the signal lamp installed in the machined itself, and covers the others with the open and impact detecting sensors. The impact detecting sensor generates and sends the signal to the security center immediately to protect the ATM machine. The control center has a rule if the emergency signal is sent and order to dispatch to the agent, the agent shall be the location within 25 minutes at the latest, however the late dispatch due to the lack of responsibility of agent and lack of number of agent and equipment will not be done of proper and rapid reaction for the ATM theft.

Therefore, GSM Technology with addition of some more components already mention above which is to suggest in this study is installed in the ATM, the advanced security System can be setup with the rapid reaction implementing in real-time even the theft is happened.

2. SIMCOM 900 GSM (Global System for Mobile Communications):

The GSM which is one of the representative wireless networks which has low-power, low-cost and convenience to use .Global System for Mobile Communications originally from Group Special Mobile is the most popular standard for mobile telephony systems in the world. The GSM Association, its promoting industry trade organization of mobile phone carriers and manufacturers, estimates that 80% of the global mobile market uses the standard. GSM is used by over 1.5 billion people across more than 212 countries and territories. A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network.

Fig. 1. GSM.

3. Vibration Sensor:

The Vibration module based on the vibration sensor SW-420 and Comparator LM393 to detect if there is any vibration that beyond the threshold. The threshold can be adjusted by the on-board potentiometer. When this no vibration, this module output logic LOW the signal indicate LED light and vice versa.

In the system we will be using a vibrating sensor (piezoelectric transducer) to find vibration from ATM machine whenever robbery occurs.

Fig. 2. Vibration Sensor.

4. Web Camera:

Fig.3. Web Camera

IV. HARDWARE RESOURCES

A. Power supply circuit

The main building block of any electronic system is the power supply to provide required power for their operation. For the microcontroller keyboard, LCD, RTC, GSM, +5V are required & for driving buzzer +12V is required. The power supply provides regulated output of +5V & non-regulated output of +12V. The hardware part consists of the components and the sensors used in the system. This part mainly collects the status of the sensors and stores it into the processor.

B. DC Motors

For the Closing the ATM door, we are using DC motors. It is operated by 12VDC power supply. In any electric motor, operation is based on simple electromagnetism. A current carrying conductor generates a magnetic field; when and to the strength of the external magnetic field

Fig.4. DC motor.

Here we are placing DC Motor for closing the ATM door while theft is trying to broken the ATM machine.

C. Motor Driver L293D

L293D are quadruple high-current half-H drivers. The L293 is designed to provide bidirectional drive currents of up to 1 A at voltages from 4.5 V to 36 V. The L293D is designed to provide bidirectional drive currents of up to 600-mA at voltages from 4.5 V to 36 V.All inputs are TTL compatible. Each output is a complete totem-pole drive circuit, with a Darlington transistor sink and a pseudo- Darlington source.

D. Buzzer

Good performance, general purpose piezo buzzer used commonly in alerting / alarming circuits. This is a PCB mountable buzzer can be easily soldered to PCB board. Most commonly used in at 5v. Long life, stable performance, High Quality with SOT plastic package

Fig.5.Buzzer

Specification

- Voltage : 2 - 5VDC
- Maximum current : 30mA/5VDC
- Decibel : > 85db/10cm
- Resonant frequency : 2500Hz (+/- 300 HZ)
- Operating Temperature : -20 to 70 C

V. SOFTWARE IMPLEMENTATION

Fig. 6. Raspberry Pi2

Features of raspberry pi2:-

A raspberry pi2 is having 900MHz quad-core ARM Cortex-A7 CPU, 1GB RAM Like the (Pi 1) Model B+. It also has: 4 USB ports 40 GPIO pins, Full HDMI port, Ethernet port, combined 3.5mm audio jack and composite video also Camera interface (CSI) and Display interface (DSI).Here we use python language for raspbian operating system.

VI. FUTURE SCOPE

- This is the embedded plus DIP based so we can make our own algorithm in micro controller   for more security concern.
- We can use these high level security transfer system for banking, military and online shopping
- We can use the powerful antennas for longer communication.

VII. CONCLUSON

Now days, most of the ATM has been attacked by the robberies. Also gradual increases the theft of ATM after the year by year.
This project demonstrates how an automation of "ATM THEFT" prevention from robbery (or) thief can be implemented using GSM Technology, vibrating sensor, dc motor, Web camera, buzzer with Raspberry pi 2 can be implemented in ATM Machines center.
By implementing this project we can catch thief and robberies in ATM itself and also we can save our precious time.

ACKNOWLEDGMENT

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