Intelligent Bank Security System

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Abstract: The proposed system concentrates on working up a framework that will extend the Banking security. The loss of advantages and rigging's a result of theft is starting at now a tremendous issue nowadays. This task is exceptionally helpful to avoid the unlawful exercises like theft. This framework embraced a venture to enhance bank security framework including locker security which depends on Ultrasonic sensor, PIR sensor, Metal Detector and microcontroller gadgets. Here the system completed some additional wellbeing highlights in the current situation so the course of action could turn out to be more secure than any other time in recent memory it would be. In this framework, we included an extremely intriguing component like the GSM to send OTP . This advanced method to build up a Banking security framework more protected when contrasted with the frameworks just utilizing a PIN or password.

Keywords: Bank security system, PIR sensor, Arduino MEGA, Ultrasonic sensor, Metal Detector, GSM Module.

I. INTRODUCTION

In the 21st century people are worried about their wellbeing, for their significant things. Old ideas and gadgets are getting changed according to necessity of them. In everyday life we have to look for new security course of action. In this manner we advance to give the most extreme level security conspire. In this present age, security was turning into an extremely critical occasion for the majority, particularly in the provincial and urban districts. A few people will attempt to cheat or take the property which may jeopardize the wellbeing of cash in the bank, house, and office. To overcome the security risk, a large portion of individuals will introduce a cluster of locks or alert system. There are many sorts of alert systems accessible in the market, which uses diverse sorts of sensor. The sensor can distinguish diverse sorts of changes happening in the encompassing and the progressions will be handled to give out an alarm as indicated by the pre-set esteem.

In present days, billions of people are making utilization of banks day by day in day-to-day life and henceforth parcel of cash can display in the bank. So Investigations and explorability are going ahead keeping in mind the end goal to enhance the security of bank exchanges. As the quantity of bank related violations, for example thefts, illicit weapons and the security of representatives are going ahead around. The innovation must be brought out keeping in mind the end goal to defeat this and the system must be made strides.

II. LITERATURE SURVEY

Now a days bank security system by utilizing Programmable Logic Controller (PLC) are outlined [1]. Some proposed system has compelling checking and controlling system for bank locker rooms which is totally self-sufficient. There are proposed security system which spares the pictures at whatever point the movement will be identified that can be utilized as a part of future for examination [10]. Also the system will impart the picture information ceaselessly to the remote area control rooms utilizing electronic observing through local area network (LAN) and can likewise send the notice message through short message service (SMS) to the administrator utilizing GSM technology [8].

Thus to improve the existing and give more strong security we are designing a system that that gives maximum security to the vault room by generating OTP and sends it using GSM.

III. PROPOSED SYSTEM

In our proposed system we outline a framework that improves security of the bank. The proposed framework is separated into a few phases. The initial segment is utilized to control two front entryways and weapon nearness sensor (indicator), second to control vault room, and third to control the alert framework when the bank isn't working (non-working hours).

Case 1: First case is when the bank is working (working hours) and while entering the bank the ultrasonics sensor which is located in front of the gate (door) of the bank will be activated and the gate (door) will be opened.

Case 2: Second case is when the bank is working (working hours) where the weapon is detected**.** When the person enters in the bank with weapon then the buzzer is in ON state.

Case 3: Third case is when the bank is working (working hours), but now the bank employee wants to enter vault room. So, if the bank employee wants to enter to vault room, he/she will need to login with the TP generated by the GSM module to open the door of vault room.

Case 4: Case four is when the bank is not working (non-working hours). All gates are closed and only the presence sensor is in active mode. When the presence of human detected during non working hours then buzzer is in ON state which alerts security person.

IV. ALGORITHM

1. Ultrasonic sensor will sense the human presence at the entry door i.e. door 1.
2. It will send the high output signal to the controller and the door 1 will open.
3. At the door 2 the metal detector will detect if the weapon is getting carried inside the bank if so the buzzer will turn on as an alert signal and door 2 will remain closed.
4. At door 3 i.e. vault room door, GSM module is interfaced through which user gets an OTP as a password to enter the vault room.
5. For the non working hours of the bank, the system has PIR sensor to detect the motion. If the motion is detected sensor sends high output signal to the controller which turns the buzzer on.
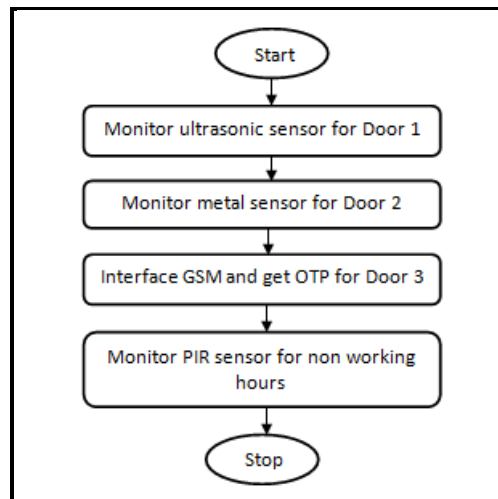
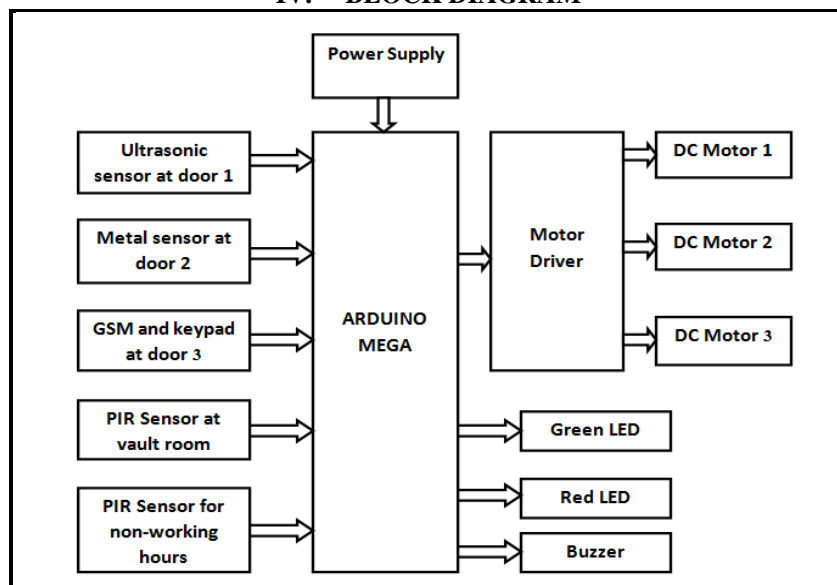## V. FLOWCHART

Figure 1: Flowchart

IV. BLOCK DIAGRAM

Figure 2: Block diagram of proposed system

Above figure shows the block diagram of the system. Power supply and various peripherals are interfaced to Arduino microcontroller. Ultrasonic sensor, Metal sensor, GSM, keypad and PIR sensor are the input peripherals to the microcontroller. Whereas Motor driver, DC motors, LEDs and Buzzer are output peripherals of the microcontroller for handling reason. As per the sensors output, controller play out the activities by utilizing output devices, for example motor, buzzer or LED.

V.   HARDWARE

1.   Microcontroller

The Arduino ATmega2560 microcontroller board has 54 advanced input/output pins (of which 14 can be utilized as PWM outputs), 16 simple analog inputs, 4 UARTs (equipment serial ports), a 16 MHz crystal oscillator, a USB association, a power jack, an ICSP header, and a reset button. We are using this microcontroller to control all the input and output peripherals attached to it.

2.   Ultrasonic sensor

The sensor has 2 openings on its front. One opening transmits ultrasonic waves, the other receives them.
We are using this sensor at door1 to open the entrance door automatically [3].

3.   PIR Sensor

When a human body or any creature cruises by, at that point it captures the principal space of the PIR sensor. There is a window which is made of normally covered silicon material to ensure the detecting component. We are using this sensor for non-working hours of the bank to detect human presence at night[3].

4.   DC motor

Electrical DC Motors are persistent actuators that change over electrical into mechanical energy. We are using three motors, one at entrance door, and one at metal detector door and one at vault room door. These motors are connected to microcontroller using motor driver IC [5].

5. GSM

This GSM Modem can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number. We are using GSM to send the OTP generated by some complex logic to the employee on his/her registered phone number [6].

IV.   ADVANTAGE

- Comparably higher accuracy and better comprehensibility, simplicity and low weight of a actuator System.
- The system provides complete security to bank.
- System is completely automatic.
- This system will have low cost, low power consumption and high accuracy.

V.   RESULT

Figure 3: Bank Model

Figure 3 shows the model of our bank security system having three doors with their respective motors.

Figure 4: Hardware Interfacing

Figure 4 shows all the hardware implementation of input section, processing unit and the output display and indicator. All the peripherals are interfaced to the microcontroller.
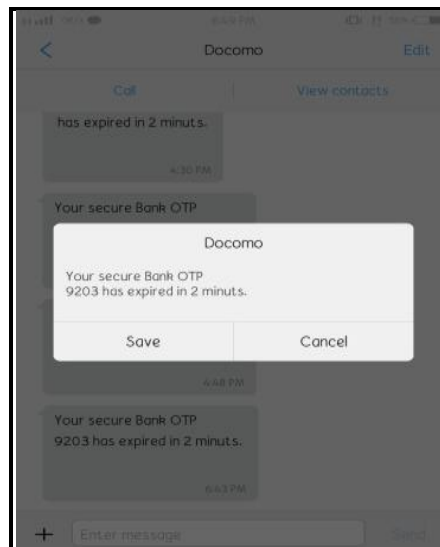

Figure 5: Received OTP Message

Figure 5 shows the OTP sent to the user who want to access the vault room.

VI. CONCLUSION

In this manner our system gives new upset in present day world. We can decrease robbery in bank locker by giving full security to it. Accordingly the withdrawn wrongdoings in banks can be controlled by our project. By actualizing our system the bank theft can be dodged thus it will give effective security in banks.

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