

IOT Based Centralized Bank Security System for Monitoring and Auto Arresting

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Abstract

Today security is a main issue for protecting the resources. Security is important because risk of intrusion and theft has become increasing. Security is also necessary for protecting banks from fire and other abnormal activities. Many people are using various types of security systems. We have found that most of the security systems are developed only for alarm using microcontrollers; in our research we use Microcontrollers with different sensors (PIR, Smoke or Fire, IR and Gas) as observatory to detect or identify intruder or abnormal activities inside the bank and ATM.

The main aim of this research is to design a system for alerting theft and to auto arrest the thief in bank or ATM itself from centralized monitoring unit. The purpose of the system is to design a smart and centralized monitoring and control system using IOT technologies.

Keywords: Bank Security System, IOT based security system, monitoring system, intruder detection system, web monitoring system.

I. INTRODUCTION

The banking industry is continuing to grow and their technology implementation is forever expanding due to the number of customers that they receive and new challenges they have to face periodically. Regardless of that, the present world of threats and thief attacking the banking industry is not reducing neither will it slow down anytime soon. Vulnerabilities are being discovered daily and exploits developed towards them mostly targeting financial institutions. Traditional methodologies for

threat and thief detection cannot work anymore thus a need for revolutionary ideas and focus when it comes to the mitigations in banking security industry. Many people focus on just firewalls and burglar applications to do carry out task with default setups to detect thief and mitigate threats. The effectiveness of such methods in the present Cyber Security world to fight against such threats and forms of attacks can be easily circumvented. Banks have to redefine their security management systems by continuous monitoring methods to be able to have a wider view and knowledge of threats they deal with on day to day basis.

IOT emerged the idea of remotely monitoring objects through the Internet. When it comes to our research, security is crucial issue to the general public banks and atm's. Currently, the increments of various theft was identified with the bank was numerous. As to diminished that proportion this thought gets to be distinctly conceivable that expanded the security level of bank robbery. The auto arresting system which make banks as advanced security viewpoints. In prior days, we have one burglar alarm at our banks for the security, but the situation has changed turns out to be current days. Individuals begin accepting on the innovation to attain some level of security in bank security. From these circumstance, we are spurred to make such system that would be prepared for highly secured one. On the off chance that one can not accessible at bank and theft was occurred at your bank that would give you a major inconvenience. This abruptly address ascend as a primary concern who illuminates you're that your bank is not protected! This framework is the response to the issues as mentioned above and can advise about burglary at your bank instantly with the picture of your bank current movement.

For enhancing the security of bank this framework is maintained by central processing unit. Assume bank was locked and a thief enters at your bank then this framework will give a caution through the burglary action. At a point when the thief movement is beginning at your bank then the PIR sensor is connected with the framework and sensed the action happened at bank. After that, it offers flag to the microcontroller. Microcontroller is computational circuit which processes the information inside it. Therefore, with help of microcontroller it can offer flag to another segment. Here, we utilize the IR Sensor for catching the present location of thief inside the bank. IR and PIR is catching the motion and presence and offer back to the microcontroller with the goal that it sends then notification to the central processing unit. While in central processing unit all the actions were monitored by the executives and information will be passed to the bank managers and local police stations. After that if the theft was confirmed by the executives by checking the values of several sensor inputs, executives activate the arresting system which locks all the doors inside the bank like manager room, locker room, .etc.. and then the executive activate the burglar alarm. So that we can catch thief very easily and also we can keep the bank secure with the help of latest technology. Compare to the cost of existing system this one is effective and cheaper.

II. EXPERIMENTAL STUDY

In this section, we are presenting earlier home security system suggested by various researchers. Following are the contributions of various researchers done in this domain:

Literature study motivates us for providing the more efficient security for the banks, so that society can invest in banks without any fear. This work reduced the threats in the society related to bank theft. Remote access to the bank provides additional features. Keeping above mentioned motivations, next section highlight the research contribution of this paper.

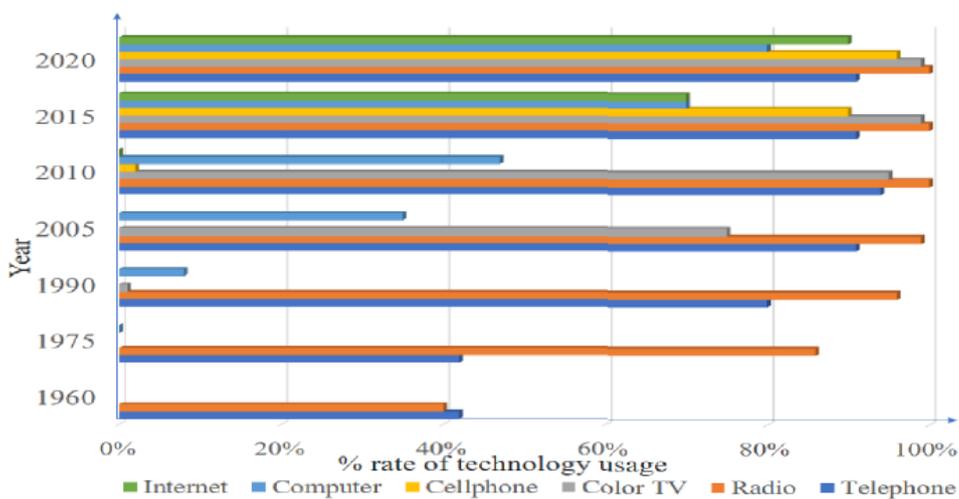


Fig1: Literature study

K. Balasubramanian et al. proposed home automation and security system which can remotely control the home appliances and alert owner on presence of intruder and occurrence of fire at home. This includes motion detection and intruder detection in sensor circuit and LDR (light dependent resistor) and RF were exchanged. Dey S. et al. Worked with web based home security system utilizing Arduino Uno microcontroller with Wi-Fi switch. Router was used to provide an IP address through an Ethernet module to the device. This ethernet module provides a static IP address, so that all devices related with same router uses TCP/IP based communication. Arduino Uno micro-controller, where the server program for controlling is executed. Thus, it does all the control over the system.

P. Vigneswari et al. introduced smart automated security system with surveillance. When an intruder entered the room, camera should be switched on and it captured pictures of an intruder. The user was cautioned by sending SMS (short message service) through GSM (global system for mobile) modem. Shaligram A. et al. introduced home security system based on GSM technology. They proposed few techniques for home security framework. The first one used web-cams for security alert to the owner, when there were movements in front of the camera. Second

technique sent SMS with the help of GSM and GPS Module. Main controller used in it was Atmega644p micro-controller, which captured signals from sensors, and based on signal makes its decision and sends situation over SMS. Android interface will be helpful for build easy Home security approach. In this system, user will get real-time status of house weathers it is secured or not and any unwanted motion occurred in house can be detected by the PIR sensor.

Sharma R. K. et al. introduced Android based GSM home security. An android application, which interprets message and consequently answer with SMS that turns on the buzzer. Through GSM modem, signal goes to the mobile phone as SMS alert. The android application instantly triggers a pop-up notification, informing about interruption in the house. Authors have also added a face recognition system here as an extra security features. When any intruder's face is recognizing by the system, then system sends the capture images to owner device. Home security based on face recognition also used in proposal. They used wireless network such as ZigBee and image processing technique PCA. After capturing the signal, it send an email and additional SMS via GSM network. Wireless Information Units and Wireless Control Unit that exchange control information. Raspberry PI micro-controller was used for central control. Kumar M. et al. introduced intruder detection and alert system using three processing units, a micro-controller, a raspberry pi single board computer and a PC. The micro-controller unit wirelessly sends an intruder alert to central PC in case of an intrusion, via ZigBee protocol.

Anwar S. et al. introduced IoT based smart home security system with alert and door access control using smart phone. A PIR motion sensor and camera module were used to detect motion and capture images respectively. Features like view video stream through mobile phone were added in system. Additionally, voice alert or siren activated to alert neighbors when intruder detected. One can also use LCD monitor for setting up Raspberry web server. Kodali R. K. et al. introduced IoT based Home Security. They sent alert to the user through Internet if there should be an occurrence of any trespass. This alert contained voice calls through Internet. If the entered person in house is not an intruder but an unexpected guest, then the owner make arrangement to welcome his guest. There is need to integrate the system with cloud to provide better services to the owner of the house. Cloud system used a PIR and IR sensor, and ARM7 micro-controller as a central controller. This approach framework sent messages after identifying intrusion via GSM module. Each webcam installed in house having an IP address, so owner easily monitor the home. In this system captured evidences are stored over the public cloud.

III. SIGNIFICANCE OF DESIGN

In Existing Methods Commercially available anti-theft burglar systems are used and its very expensive and open type even thief can disable it. Also an human security was appointed to monitor the bank. This makes the system costlier. Current camera surveillance systems can be used for monitoring but they require a huge amount of data storage due to continuous video recording. However, our system only monitors

the area when motion is detected and there is a possibility of certain activity. Our system also sends a notification, in case of suspicious activity as it is not possible to continuously keep a watch on such activities.

In our proposed research we use Microcontrollers with different sensors (PIR, Smoke or Fire, IR and Gas) as observatory to detect or identify intruder or abnormal activities inside the bank and ATM. The main aim of this research is to design a system for alerting theft and to auto arrest the thief in bank or ATM itself from centralized monitoring unit. The purpose of the system is to design a smart and centralized monitoring and control system using IOT technologies.

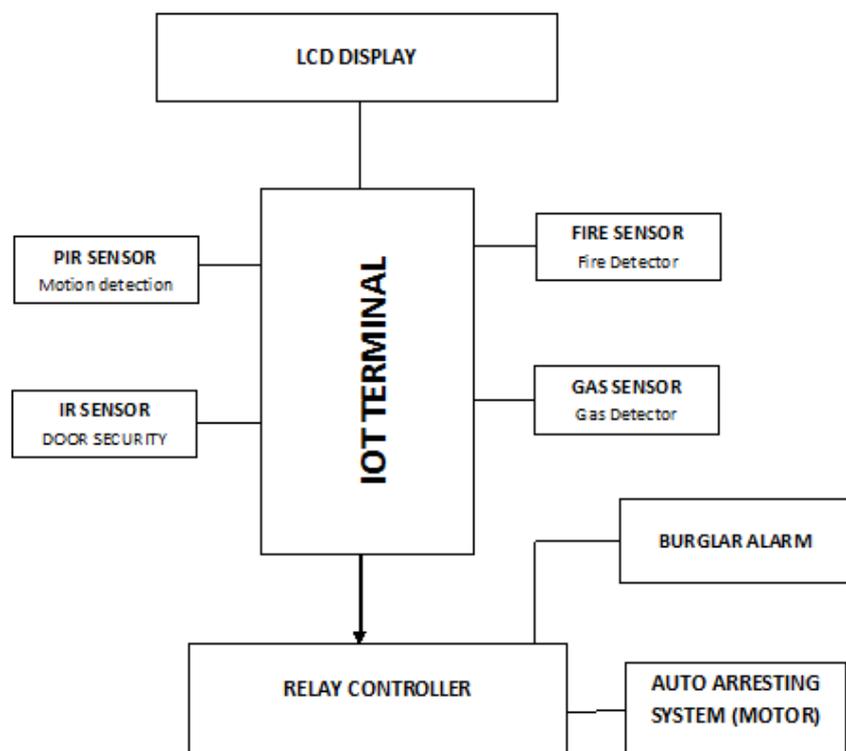


Fig2: Bank section block diagram

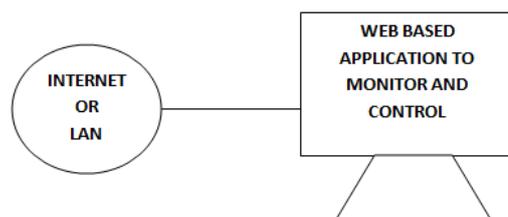


Fig3: IOT section block diagram

In the above block diagram clearly illustrated about the proposed system, our proposed system consists of IOT Terminal which connected with different sensors like PIR, IR, fire and Gas Sensor interconnected with relay board. Were the relay was connected with burglar alarm and auto arresting system. Here the data of the sensors will be directly uploaded to cloud server using GSM Technology.

IV. EXPERIMENTAL RESULTS

PIR sensor was fixed in various part of bank and IR sensor was fixed in the entrance of every rooms. Fire and Gas sensor will be fixed in the locker area where all the doors are connected with magnetic locks controlled by relay and burglar alarm connected with the relay circuit. For testing purpose we used single sensors in real time implementation we can proceed with multiple sensors, in future implementation the tested results will give the expected security intimation in real time with proper results. In this proposed work, the PIR and IR sensors did their work accurately with no time delay with the microcontroller, if the signal is valid then microcontroller display the information about the intruder inside the bank to the central processing center. Then the intruder will be arrested with auto arrest system and information will be sent to the Police and bank manager through the central processing centers. We have used some hardware components like sensors for detection of motion, fire, gas. We used motion sensor to detect the motion of the persons in the bank, we detect fire leakage or gas leakage by using fire and gas sensors. We link all sensors in the IOT terminal and by using the LAN connection we set up an web based application to monitor or control the movement's in the bank.

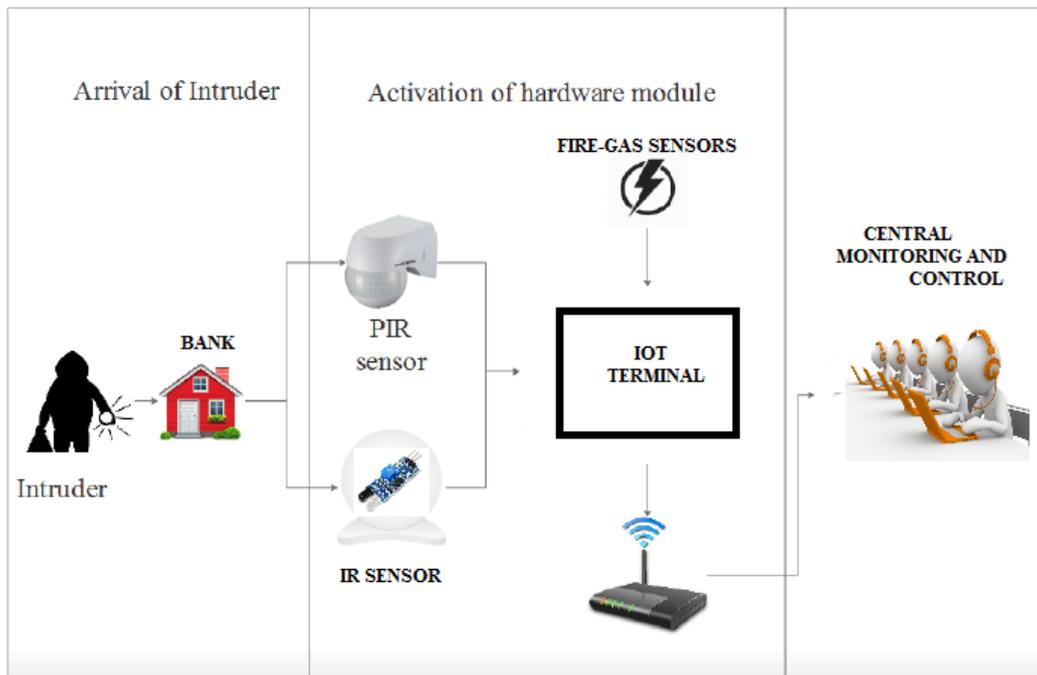


Fig4: Outlook of the project

V. CONCLUSION

This is a real time application based which tells that there is a need to bring in a revolution in the bank security by making the procedure a little easy and more systematic for the bank officials. It is a low cost, low in power conception, compact in size and standalone system. The microcontroller compares the sensor values. If the intruder was identified the information will be securely processed and monitored through central processing center. By using this method instant monitoring and control was possible. No need to monitor continuously and less human was involved in monitoring section.

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