International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.01, March 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

Anti-theft Locker Security System (Using IOT ,GSM & GPRS)

Ms.Bhatkar Bhakti Girish[1], Mr.Sankapal Pranesh S.[2], Mr.Chinchanikar Aditya Mahesh[3], Mrs. Mulla Shagupta M.[4]

[1,2,3]*CSE Dept.,BVCOE,Kolhapur (India)*
[4]*Asst. Prof., CSE Dept., BVCOEK,*

ABSTRACT

The idea of this project is to implement a secure, non hack able, suthenticated locker system to use in the banks or anywhere it is needed. What happens with traditional Key based access system, keys can get cloned or can get lost or theft & unauthorized access can ruin someone's life. Over last few years some sort of digital security entered in this lockers and lockers became accessible keyless but by digital or biometric authentication. But both password system as well as biometric scanning systems faced many problems like password hacking or CCTV recording, thumbprint mismatch etc. To avoid these problems, we are developing the new solution of keyless digital authentication & access system by using RFID tags. In this idea, we have interfaced the RFID reader to the microcontroller. The user of this system will have his own passive RFID tag. This RFID tags have their own ID numbers and each tag in this world in unique tag & non replicable. Whenever user wants to access his locker he just has to scan his tag on reader just in few seconds. If the tag or user is valid then the locker will be accessed & opened for preset time & it will automatically close after time lapse. If the card is invalid, then locker will not be accessible to the person. A small LCD is used to display the status of system.

Keywords—Microcontroller ,GSM, Locker System, RFID reader

I.INTRODUCTION

The Bank, which is a place that indicate very high level security. In day to day life every person is involved in banking transaction. Because of high level security, we uses bank locker to secure our important document, expensive jewels, or cash etc in it. Hence it has become a very important part for every common human being.The user has to tag the bank official along with him/her locker. The user key along with the bank official's key can provide access to user. The conventional method has many drawbacks such as-

- Both the bank employees must have to present with the keys to open the locker.
- There is possibility of losing the key which makes the system insecure.
- The system is unable to match with today's fast pacing digital world.
- The keys can be duplicated.

Due to the above mentioned drawbacks, a need has arose to develop a more secure, reliable and faster technique which would overcome the drawbacks and provide full security to the customer. Hence, we have proposed a more secure system which employs RFID and GSM technologies. The proposed technique activates, authenticates and validates the user and then unlocks the locker.

Our proposed system consist of a microcontroller ,RFID reader, GSM modem and LCD, the RFID reader reads the id number from a passive RFID tag and sends it to the microcontroller where it checks whether it belongs to the valid person or not. (from stored data in memory of microcontroller). if the id number is valid, then microcontroller sends an SMS with details of activity to it's authenticated user and locker will open for specified amount of time. if id number is not valid then locker will not be open and alert message will be sent to it's authenticated user. here GPRS provides real time information that, it will provide mobile alert system to authenticate user as he/she will opened the locker, the user will get message of day, date & time.

II.REALATED WORK

We are going to represent literature overview of few papers that we have studied for choosing the topic as follows:

Paper [1] has represented Bank Locker Security System based on IoT which can be organized in bank, secured offices. It is fully self-determining in case of robberies it detects banned entrances in locker room. If robbery happens it is difficult to recognize thief due to absence of proof. This system is designed in such a way that it will recognize and control illegal person to access the locker. These achieves the safety of bank locker room and avoid illegal access to locker. This paper proposed of three phase of confirmation one is by android app with fingerprint with OTP. This uses android app which generates OTP for registered numbers only this highlights high security. It is highly proficient and consistent and no one can break the combination of three stages.

Paper [2] have proposed design & implementation of high security locker system using RFID, fingerprint, password, GSM technology which can be organized in bank, secured offices & homes. They have implemented Locker Security system based on RFID, fingerprint, password & GSM containing door locking system where fingerprints are one of many forms of biometrics, used to identify individuals & verify their identity. They have also used algorithms & four sensor designs which gives more security than other systems. It is low cost, low in power consumption, compact size. The microcontroller compares the password entered by the keyboard & received through mobile phone & if password is incorrect it gives SMS alert to authenticate user.

Paper [3] has represented IoT based low cost smart locker security system which can be implemented in ever home and office. Now-a-days breaking the locker and stealing the things is common in home and office during night time and also when owner is out station. This system used for domestic purpose to the public where they require safety for jewels, money and documents. This system alerts the owner of the smart locker by sending messages on mobile. This uses arduino with GSM module and biometric scanner.

In [7], one more approach using GSM technology to communicate with the remote devices via SMS is remote metering system, in this paper illustrates a technique for remotely reading electricity meter readings using SMS. Both postpaid and prepaid are feasible to implement using this architecture as SMS based data gathering can be done very quickly and efficiently.

In [8], Digital door locks have been widely used as a part of IoT. This system avoids invalid users to invade homes and offices. This system is designed and implemented to enhance security and convenience. It also provides strengthened security functions which transfers recorded images to the registered mobile devices. When invalid operation takes place it deliver alarm. This system enables users to check access information and remotely operate door lock.

In [10], This concentrates on buildings the loss of equipment due to theft is big problem stilling can be done significantly but it must be reduesed by using proactive management technique. This represented backing locker system based on RFID GSM system and microcontroller devices. This carried out some extra safety features like addition of MEMS technology. MEMS accelerometer is implemented using embedded microcontroller. hare user can assign a predetermined password by a fix set of motions

2.1 Proposed Method

In this proposed work, the RFID reader reads the data from tag and send to the microcontroller, if the card is valid then microcontroller display the account holder name and number. No password system is available .its simply work on RFID reading.

If the tag is valid then microcontroller sends the SMS to account holder mobile number and it will sopen up the locker system. If your tag is invalid then microcontroller will send the alert message to authenticated user that someone is using your tag & will not open the locker. The microcontroller compares the tag-id with loaded tags ID. Here we have provided time quantum for opening of locker we have given 20 sec for open and close session. This method is simple and more secure than other system like password, fingerprint scanner etc.

2.2 RFID Fundamentals:

Basically, an RFID system consists of an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. There are many different types of RFID systems in the market. These are categorized on the basis of their frequency ranges. Some of the most commonly used RFID kits are low frequency (30-500 kHz), mid-frequency (900 kHz-1500MHz) and high-frequency (2.4-2.5GHz).Basically, an RFID system consists of three components: an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. An RFID reader is a device that is used to interrogate an RFID tag.

The reader has an antenna that emits radio waves; the tag responds by sending back its data. An RFID tag is a microchip combined with an antenna in a compact package; the packaging is structured to allow the RFID tag to be attached to an object to be tracked. "RFID" stands for Radio Frequency Identification. We are using the RFID tag(125 kHz)ultra sonic tag. A passive tag is an RFID tag that does not contain a battery; the power is supplied by the reader. When radio waves from the reader are encountered by a passive RFID tag, the coiled antenna within the tag forms a magnetic field.

2.3 GSM and GPRS

The GSM modem is a specialized type of modem which accepts a SIM card operates on a subscriber's mobile number over a network, just like a cellular phone. Basically, it is a cell phone without display. modem sim300 is a tri-band GSM/GPRS engine that works on EGSM900MHz,DCS1800MHz and PCS1900MHz frequencies.GSM Modem is RS232-logic level compatible, i.e., it takes-3v to -15v as logic high and +3v to +15 as logic low.MAX232 is used to convert TTL into RS232 logic level converter used between the microcontroller and the GSM board.

The GPRS is same as GSM network, but has additional entities that allow packet data transmission. This data network overlaps a second generation GSM network providing packet data transport at the rates from 9.6 to 171 kbps.

2.4 Aurdino Uno Board:

Arduino is an open -source (free to be modified and distributed in terms of hardware and software) physical computing platform based on a simple Input/output board built around Atmel AVR processors and a development environment (software) that implements the 'Processing'/Wiring language (modified C language). It consists of a standard programming language compiler and the boot loader that runs on the board. It's a plug, compile, Upload and play system.

Features of Ardino Uno:

- Digital I/O pins-14
- Analog input pins-6
- Flash memory-32kb
- Clock speed-16MHz

Figure: Ardiuno Uno

III.BLOCK DIAGRAM

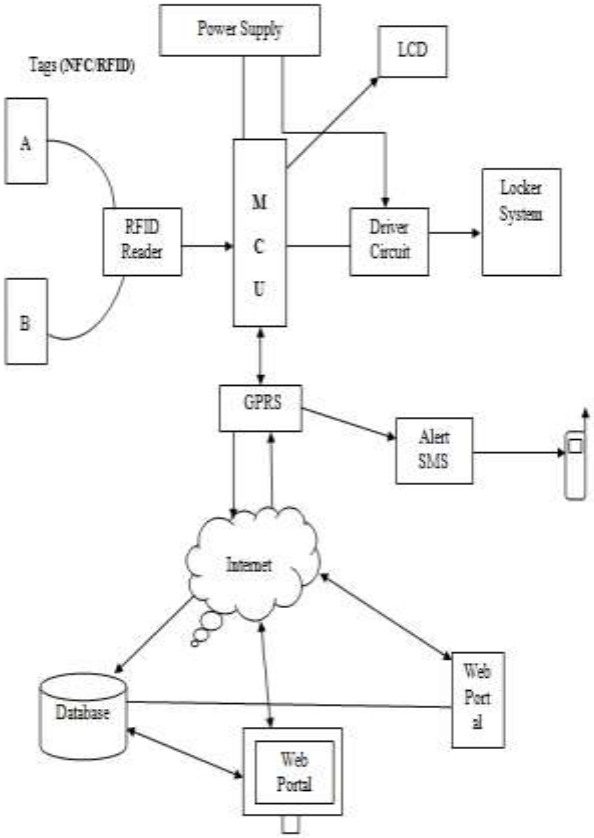

Figure: Bank Locker System using IOT & RFID

The block diagram of Bank locker system based on RFID and GSM technology is shown in the figure. It comprises the power supply section, keyboard, RFID Reader, ATMega328 microcontroller, MAX232driver, relay driver and GSM modem, LCD & GPRS. The GSM board has a valid SIM card with sufficient recharge amount to make outgoing calls. The circuit is powered by regulated +5v dc. It also has tags for valid and invalid.

IV.CONCLUSION

We have proposed a Bank locker security system using IOT and passive RFID, GSM & GPRS. It is a low cost, low in power conception, compact in size and standalone system. The microcontroller compares the tag is provided by the authorized organization & if user gets entry then it will give message to mobile phone of authorized user. If these tags are valid then the microcontroller provides necessary control signal to open the bank locker. If invalid tag is accessed then Alarm will be turn on whenever door is forced to open. Future work of this paper, is planned to a develop security system based on 3G camera for visual identification of the person.

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