

Fingerprint based Security System Banks

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Abstract— Security is important thing for every bank locker system. Every Bank is given facility to public for storing their expensive things like money jewellery etc. in their locker. This paper presents a security system for Bank locker based on fingerprint, password and GSM technology which provides more security. The traditional Bank Locker system has a drawback: - locker is operate as manually means user can open his locker using key. So there may be chances of stolen of keys due to of this the time period is longer to get new keys. To overcome this drawback we have proposed in this paper “Fingerprint Based Bank Locker Security System”. Fingerprint & GSM technology is used instead of keys. Every person has unique identity is fingerprint so fingerprint is used for verify the person and their identity. When any unauthorized person is entered incorrect password then customer will receive a message on his mobile through GSM technology.

Key words: ARM Microcontroller, Fingerprint Module, GSM Module, Motor Drive, DC Motor, LCD, Keyboard, Buzzer

I. INTRODUCTION

Now-a-days peoples are more conscious about their safety. Therefore it is necessary issue for peoples in rural & urban areas. In conventional security system user can open their locker using keys. Sometimes there may be chances of stolen of keys. So any unauthorized person can access the locker. Hence it cannot provide higher security. In this paper we use Biometric and GSM based security system which provides more security than conventional system. Fingerprint is unique identification for every person. So we use fingerprint module for scanning the no. of only authorized person to open the bank locker with GSM technology. In this system only authentic person can be access the locker with password protection method.

II. EXISTING SCENARIOS

The purpose of this project is to improve the security for lockers because conventional bank lockers are not secure so to overcome this problem we implementing this project. In this project each locker has separate fingerprint module to open the locker. Firstly user scan their fingerprint. After the scanning process is completed then user will enter their password using keypad. If the password is correct then the locker will open and if the password is incorrect then buzzer sounds & message will send to the authorized person using GSM module.

III. LITERATURE REVIEW

1) R.Srinivasan, K.Gobinath focused on security system which depends on RFID and GSM technology which can be organized in banks. The initial security levels are RFID verification and PASSWORD. After this security verification the details of the person will provided to the

security in charge like manager. After that confirmation the GSM server send the random password to the customer mobile. The locker can be accessed if the password matches. Otherwise the alarm is on.

- 2) Abhilasha A Sayar, Dr.Sunil N Pawar introduces that Securing Bank Locker System Using Embedded System. In that paper they implemented a bank locker security system using RFID and GSM technology. RFID tags are used to holds the user’s information like his name, locker number assigned to his locker etc. In that project RFID tag is read by the RFID reader, which will help customer to open his lock electronically. As locker system is electronic, security is guaranteed and the customer waiting time is reduced. This system uses the technologies like RFID for identification, GSM for communication which has been controlled by an ARM controller depending on real time clock.
- 3) Hemant Kumar, Pradeep Kumar Gupta focused on Fingerprint Based Locker with Image Capture. The basic principle of this system is based on fingerprint authentication system. The optical scanner or capacitance scanner is used to scan and generate a picture of the user’s finger. Though both the methods generate the same type of image but the making is completely different.
- 4) Atar Nasrin, Awatade Vidya introduces that Bank Locker Security System Using Fingerprint and GSM technology. In that users scan their fingerprint. After the scanning process is completed then the password has to be entered. If the password is incorrect then the signal is given by buzzer and the message will be send to the authentic person with the help of GSM module.

IV. PROPOSED SYSTEM

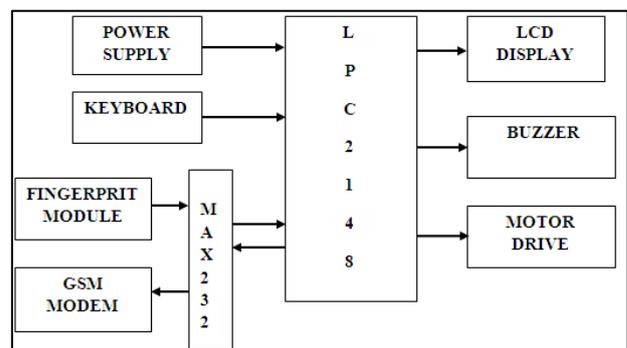


Fig. 1: Block Diagram

The block diagram of locker system consists of fingerprint, password and GSM technology. We use Fingerprint module for scanning number of only authorized persons to open the separate bank locker with GSM technology. The people’s information is stored in the RAM of LPC2148. The scanner is interfaced to LPC2148 ARM microcontroller; this controller will be controlling the scanning procedure. After the scanning has been completed, user has to enter the

password to open his locker with the help of a keypad. At this instant the locker will be opened. After the work has been completed if any key is pressed again with help of keypad the locker door will be closed again. If any unauthorized person tries to scan his fingerprint image then the buzzer sounds which is interfaced to the controller and also if incorrect password is entered by the user again indication will be given by the buzzer and message will be send to the authentic person with the help of GSM module.

A. ARM



Fig. 2: ARM

ARM 7 is the most popular 32 bit microcontroller in embedded family developed by Acorn computers limited. It is based on RISC architecture. This architecture provides less power consumption, reduces heat and also reduces cost. It provides real time emulation. It support 32KB to 512 KB flash memory and 8KB to 40KB on chip static RAM. In our project ARM controller is used to control the function of locker security system.

B. GSM



Fig. 3: GSM

GSM (global system for mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services. GSM is a global system for mobile communication is mostly used for sending or receiving data such as voice and message. In this security system GSM plays an important role. GSM supports voice calls and data transfer speeds of up to 9.6 kb/s, together with the transmission of SMS (short message service).

1) Features of GSM

- Single supply voltage 3.2V-4.5V
- Typical power consumption in SLEEP Mode: 2.5mA.SIM300 tri-band
- Supported SIM Card: 3V

C. Fingerprint Module

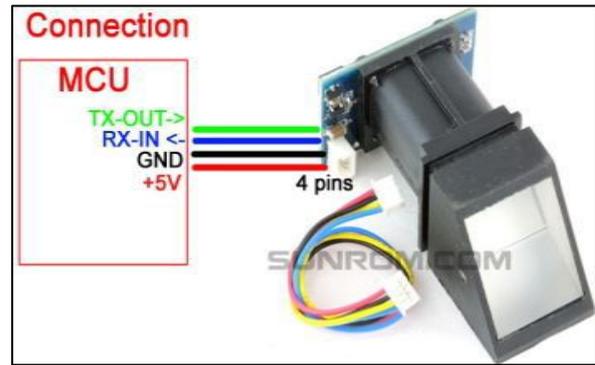


Fig. 4: Fingerprint Module

Fingerprints are one of several forms of biometrics, used to recognize persons and verify their identity. The analysis of fingerprints for identical purposes generally requires the similarity of several features of the print pattern. This is a fingerprint sensor module with TTL UART interface. The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying someone. The finger print module can directly interface with 3.3 or 5V Microcontroller.

1) Features

- Power DC: 3.6V-6.0V
- Interface: UART (TTL logical level)/ USB 1.1
- Working current: 100mA
- Peak Current: 150mA
- Matching Mode: 1:1 and 1: N
- Character file size: 256 bytes
- Image acquiring time : <0.5s
- Template size: 512 bytes
- Storage capacity: 120 fingerprints

D. LCD

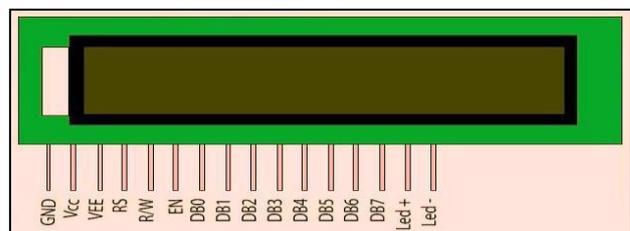


Fig. 5: LCD Display

We use 16*2 character LCD display. LCD is used to display message access granted and access denied. In LCD has 16 characters per line by 2 lines and 20 characters respectively. When lockers will be open and close. LCD display is used for the displaying the message or to open and close the door and also display enter the password etc.

E. DC MOTOR



Fig. 6: DC Motor

This direct current motors series, whose power range goes from 45Watt to 1500 Watt .Using L293D and L298 are dual H-bridge motor driver ICs. We can control the rotation of two motors in both clockwise and anti-clockwise direction. DC motors are used to physically drive the application as per the requirement of system. The dc motor works on 12V. To drive a dc motor, we need a dc motor driver called L293D.

V. SOFTWARE IMPLEMENTATION

The software program is written in c or assembly language and compile using Keil software. After compiler operation the hex code is created and stored in the computer. The hex code of the program is burnt into the LPC2148 by using Top win Universal programmer. The architecture of the ARM7 is more suitable and easily accessible for present code software like as Keil. Keil version web pack is user friendly software tool, which is having many superior developed programs. The program can be downloading into device easily by using parallel ports

VI. FLOWCHART

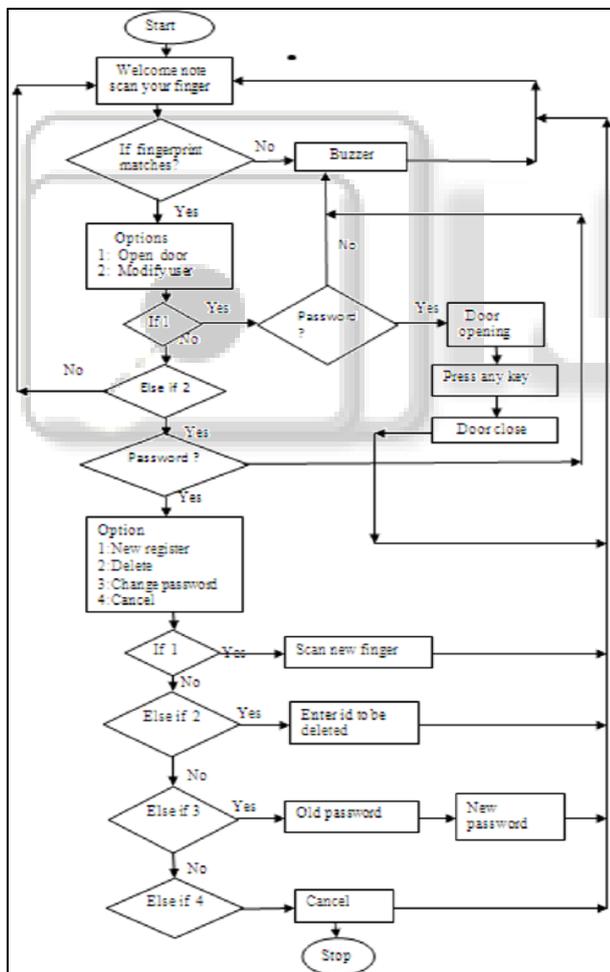


Fig. 7:

VII. ADVANTAGES

- The most commonly available device.
- Relatively low cost.
- High accuracy in terms of security.

- Simple to use and require no special training equipment.
- Fingerprint is unique for each person it cannot be fabricated.

VIII. APPLICATION

- Secured offices.
- Industrial automation.
- Prevent unauthorized access to ATMs, Cellular phones, Smart cards, Desktop PCs, Workstations, Computer & network security.
- Airport security, voter cards, Healthcare, DNA Matching, Time and Attendance.
- Electronic commerce, Electronic banking & financial services.
- Criminal identification, Courts.

IX. CONCLUSION

In this project, we have first reviewed the recently proposed bank locker using key & there are some disadvantages. It may be provide incorrect person access to the account. So in this, we are implementing security system based on biometric. This system is secure & it will be the best banking system. Biometric and GSM security is provided correct and fast user verification. Fingerprint is a unique identification for everyone. This system has successfully overcome some of the aspects of existing technologies, by the use of fingerprint biometric as the authentication technology.

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