

FINGERPRINT BASED SECURITY SYSTEM FOR BANKS

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Abstract - In this paper we design and implement a locker high security system based on fingerprint, password and GSM technology which can be organized in banks, protected offices and homes. In this system bank will collect the biometric data of each person for assigning the lockers only authentic person can be recovered money, documents from the locker. We have implemented a locker security system based on fingerprint, secret word and GSM technology containing door locking system which can activate, authorize, and validate the user and unlock the door in real time for locker secure access. Fingerprints are one of many forms of biometrics, used to identify persons and verify their identity. The technology can be used to identify, track, sort or detect a wide variety of objects.

Key Words: ARM, GSM, Fingerprint Module, Motor drive, DC Motor, LCD, Keyboard, Buzzer

1. INTRODUCTION

In this paper at the present age, safety has become a necessary issue for most of the people mainly in the rural and urban areas. Some people are more concerned about their safety for their expensive things like jewellery, money, etc. So the bank lockers are the safest place to accumulate them but the conventional security system is not providing the higher security because in conventional security system a user can open the lockers using keys. Sometimes the keys could be stolen. Then the user will apply for original keys but the time period is longer to get new keys so in its place of using this security system we have implemented. In this present age, safety has become a necessary issue for biometric and GSM based security system which provides more security than conventional system. In this paper we have implemented security of the money in the bank locker, house, and workplace (treasury) by using Fingerprint and GSM technology which will be more protected than other systems. We use only one Fingerprint module scan for no. of only authorized persons to open the separate bank locker with GSM technology. In this paper we have designed and implemented a bank locker safety system based on Fingerprint and GSM technology. In this system only authentic person can be recovered money from bank locker with password protection method.

2. RELATED WORK

The purpose of this project is to increase the security for lockers because conventional bank lockers are not secure so to rectify the problem which we discuss above we are implementing this project. In this project each locker has a separate fingerprint module to open the locker. Users scan their fingerprint. After scanning process complicated user enters their password with the help of keypad then their particular locker is open. After the work has been completed if key is pressed again with help of keypad the locker door will be closed again. If an unauthorized person tries to check his fingerprint image then a signal will be given by a buzzer 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 we are using GSM modem to send the message on mobile of manager.

3. PROPOSED WORK

The block diagram of locker system based on fingerprint, password and GSM technology. We use only one Fingerprint module scan for number of only authorized persons to open the separate bank locker with GSM technology. The more people stored the data 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 secret code to open his locker with the help of a keypad. Instantly the locker will be opened. After the work has been completed if key is pressed again with help of keypad the locker door will be closed again. If an illegal person tries to scan his fingerprint image then a signal will be given by a buzzer which is interfaced to the controller and also if incorrect code word is entered by the user again indication will be given by the buzzer. The current user instead of him/her can make a new person as the user of the similar locker by new registration procedure and the old user's fingerprint image will be deleted. Option for changing the secret code is also available.

4. BLOCK DIAGRAM

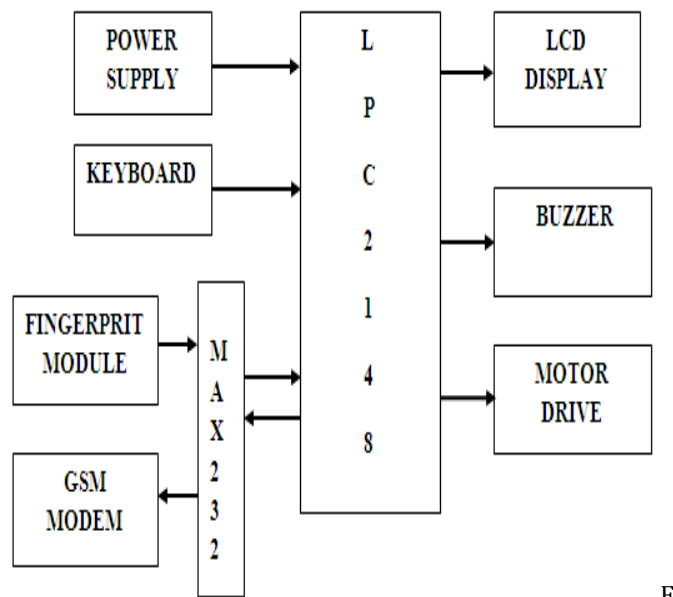


Fig.4.1. Block diagram of fingerprint based security system for banks

- 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

4.2. GSM:



Fig.4.2.1. GSM Modem

4.1. FINGERPRINT MODULE:



Fig.4.1.1. 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 the someone. The finger print module can directly interface with 3v3 or 5v Microcontroller.

Features:

- Power DC : 3.6V-6.0V
- Interface : UART(TTL logical level)/ USB 1.1
- Working current : 100Ma

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 kbit/s, together with the transmission of SMS (short message service).

Features of GSM:

- Single supply voltage 3.2v-4.5v
- Typical power consumption in SLEEP Mode: 2.5mA.SIM300 tri-band
- MT,MO,CB, text and PDU mode, SMS storage: SIM card
- Supported SIM Card :1.8V,3V

4.3. ARM:



Fig.4.3.1 LPC2148 IC

It is a 16/32-bit ARM7TDMI-S microcontroller in a tiny LQFP64 package. It has 8 kB to 40 kB of on-chip static RAM and 32 kB to 512 kB of on-chip. It offers high performance small size low power. It is having two UART pin UART0 AND UART1 from UART0 interface through pc using serial cable.

4.4. LCD:

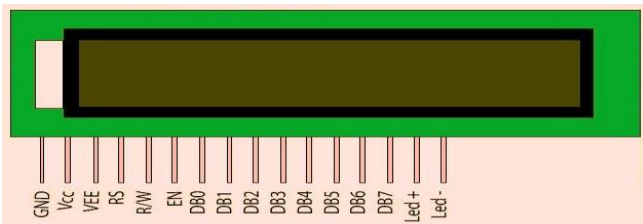


Fig.4.4.1. LCD Display

The board which we used is shipped with 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 per line by 2 lines, 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 the enter the password etc.

4.5. DC Motor :



Fig.4.5.1 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.

5. SOFTWARE IMPLIMENTATION

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

6. RESULT

Step 1: When power is supplied to the board, the first displays on the LCD.

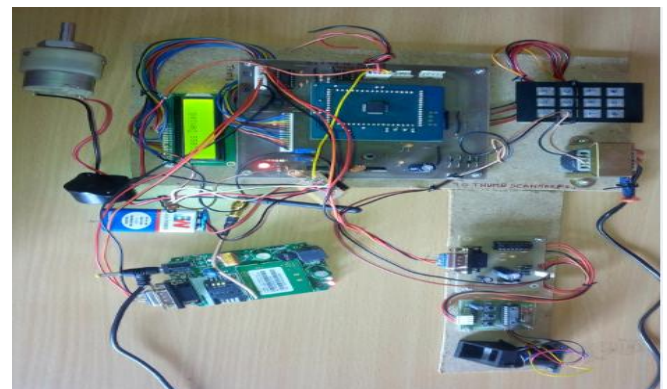


Fig.6.1 Experimental observation

Step 2: LCD display the welcome note scan fingerprint .

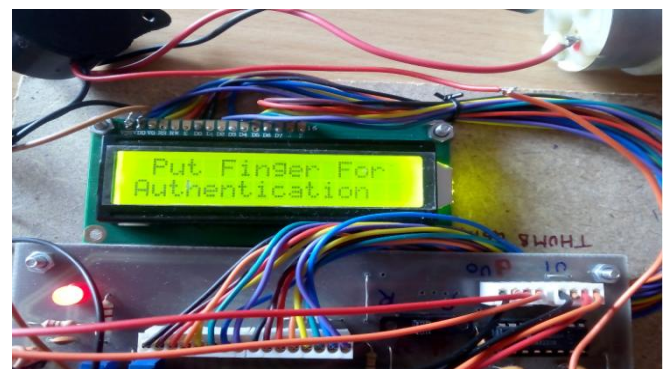


Fig.6.2 Indication to scan the finger



Fig.6.3 Scanning the finger



Fig.6.4 Enter the password

7. FLOW CHART

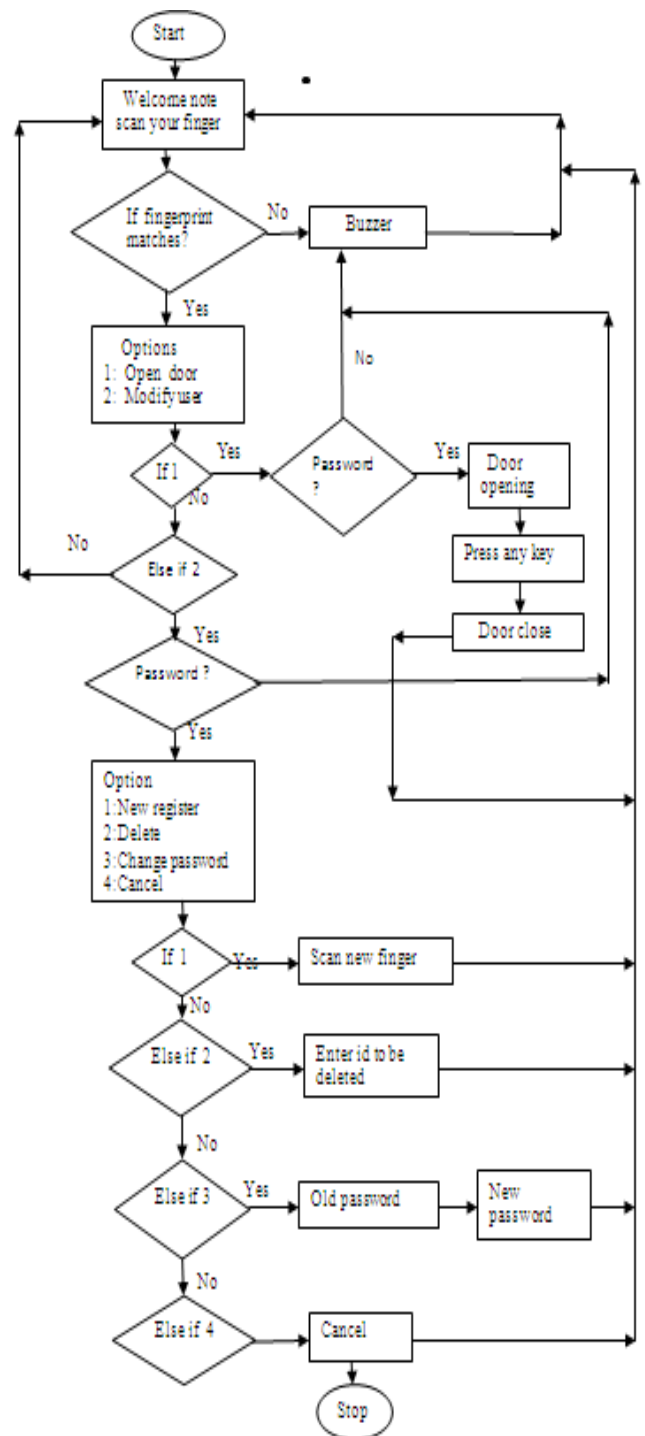


Fig.7.1 Flow chart

Step 3: If the fingerprint is matched, it display 2 options.

Step 4: When option 1 (open door) is selected then display on LCD.

Step 5: When option 2 (modify user) is selected then display on LCD.

Step 6: If fingerprint is mismatched, display on LCD.

Step 7: Buzzer will be ON.

Step 8: After step 3 we need to enter the valid password.

Step 9: After step 7 it will be door open automatically.

Step 10: After work has been completed, we have to press any key for closing the locker door and it back to step 1.

Step 11: When option 2 is selected, it displays four options. Select required option, for example if option 4 i.e. cancel option is selected it goes back to step 1.

8. ADVANTAGES

- The most commonly available device.
- Relatively low cost.
- Maintenance of time
- High accuracy in terms of security..
- simple to use and require no special training equipment.
- No false intrusion
- No manual errors
- Fingerprint is unique for each person it cannot be imitated or fabricated

9) 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, prison security, Courts.

10. CONCLUSION

In this paper, we have first reviewed the recently proposed using locker key for banking though they are secured there are some disadvantages. It may be provide incorrect person access the account. So in this we are implementing security system based on biometric. This system is secure and less cost it will be a best banking system. Biometric and GSM security is provided correct and fast user verification. Because biometric cannot be forgotten they are difficult for attackers to forge and for user to repudiate. Fingerprint a unique identification for everyone. He found out someone is try to open his locker. The system has successfully overcome some of the aspects existing with the present technologies, by the use of fingerprint biometric as the authentication technology.

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