Finger Print Based Bank Locker Security System

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***Abstract*— The main goal of this project is to design and implement a bank locker security system based on Finger print and OTP technology. This can be organized in bank, offices and homes. In this system only the authenticate person recover the documents or money from the lockers. In this security system fingerprint and OTP is used. In this system first person enroll user name and password and mobile number. If user name and password matches then Finger of person will detect and store with ID. If the ID gets matches. Then four digit code will be sent on authorized person mobile to unlock. So biometric and Bluetooth security is more advantages than other system. This system can also create a log containing check in and checkout of each user along with basic information.**

Keywords: Fingerprint, Microcontroller, Bluetooth

I. INTRODUCTION

In the real world, peoples are more concerned about their safety for their valuable things like jewellery, money, important documents etc. So the bank lockers are the safest place to store them. The arrival of fast growing technologies makes users to have high security systems with electronic identification options. These identification technologies include Bank Lockers and ATM as well as other intelligent cards, user IDs and password based systems, and so on. But, unfortunately these are not protected due to hacker attacks, thefts, and forgotten passwords. In spite of all these faults or failure and malfunctions or crash these systems are still existing; however, the biometric or fingerprint authentication based identification is the most efficient and reliable solution for stringent security.

Biometrics measure individual's unique physical or the characteristics to recognize or authenticate their identity The physical characteristics are fingerprint hand, face, iris etc and the characteristics are signature, voice keystroke patterns etc. Biometric system operates in verification mode or identification mode. In the verification mode system validates person's identity by comparing the captured biometric template which is pre-stored in the system data base

.In the identification mode the system recognize an individual by searching entire template data base for match. And the system performs one to many comparisons to establish the individual identity or fails if the subject is not enrolled in the system data base. So in our project we are using fingerprint security system.

Global system for mobile communication (GSM) is mainly used for sending or receiving data such as voice and message. In our security system GSM plays important role. Through the use of GSM the user will get the message if an unauthorized person will try to open the lock. We are implementing this bank locker security system using fingerprint, password and GSM Technology based security system which provide most efficient and reliable security system than the traditional system.

II. LITRETURE SURVEY

These are some of the existing Smart Security designs that have been implemented-

(a) GSM Based Security System PIR sensor detects motion by sensing the difference in infrared or radiant heat levels emitted by surrounding objects. The output of the PIR sensor goes high when it detects any motion. The range of a typical PIR sensor is around 6 meters or about 30 feet. When the PIR sensor detects any motion, the output of the sensor is high. This is detected by the Arduino. Then it communicates with the GSM module via serial communication to make a call to the pre-programmed mobile number. An important point to be noted about PIR sensors is that the output will be high when it detects motion.

(b) IR based security alarm system-
IR based security alarm circuit can detect any movement and trigger the alarm. This circuit is very useful in homes, banks, shops, restricted areas where an alert alarm is needed on any movement.
This circuit is based on IR sensor where an IR beam is continuously falling on a photodiode, and whenever this Infrared beam breaks, by any kind of

movement, alarm is triggered. In this IR based security alarm circuit, we have placed IR LED in front of photodiode, so that IR light can directly falls on photodiode. Whenever someone moves through this beam, IR rays stops falling on photodiode and Buzzer start beeping.

Internet of things has been governing the electronics with cloud services influencing the ever increasing electronics product segment. Security and safety has always become a basic necessity for urban population. The paper proposes a security system based on Open source cloud server "things speak .com" and a low cost esp8266
Wi-Fi module. The project includes a PIR module which constantly monitoring the Home or Work space to be monitored .When the PIR module detects a intruder it sends a signal to the Atmega 328p microcontroller and the controller is connected to a Esp8266 wifi module and also to a alarm system. The System transmits an alert signal to the Open source cloud which provides a alert signal on the users mobile phone. The system employs a second esp8266 module which is programmed to act as a web server, which allows the user to activate or deactivate the security system by means of any device with internet. The system also employs a thumb print reader rs305 which controls the opening and the closing of
a safety locker door. Thus the system uses esp8266 Wi-Fi module and atmega328p to control the security system from the user's mobile phone by means of any device with a potential internet connection.

III. PROPOSED SYSTEM

The proposed system consists of an LDR (Light Dependent Resistor) based sensor which acts as an electronic eye for detecting the theft or attempt, and a signalling procedure is monitored in smart phone via wireless Bluetooth device. Fingerprint module is used for authorized person to unlock the bank locker. Once a Finger print is scanned it sends a OTP to the registered mobile number. If it matches the locker may unlock. In case of any unauthorized person try to unlock than alert message is send to mobile via Bluetooth to monitor the bank locker security details.

Finger Print Sensor

Figure 1. Finger Print sensor

The sensor is a solid-state fingerprint sensor that reliably captures fingerprint information. It is designed to integrate into devices for improved security and convenience. The sensor provides a reliable, quick and user-friendly alternative to passwords, PIN's and other forms of user authentication.

Key Pad

User need not carry any physical cards (credit, debit etc.) or mobile phones for money transaction. User just need to keep finger print enter transaction amount using keypad. This transaction information is sent to server over secure IOT (Bluetooth) and further processing done there. If the transaction is successful then user gets

SMS confirmation message to his registered phone number.
This on-board computer consists of number of input and output ports. The on-board computer is commonly termed as micro controller. The input and output port of the micro controller are interfaced with different input and output modules depending on the requirements. In other words micro controller acts as a communication medium for all the modules involved in the project. The device also consists of Bluetooth device, Serial Communication, Keypad, 16x2 LCD which displays the information about transactions, dc power supply, alert unit.

Android Smart Phone

Figure 2. android smart phone

Android is popular with technology companies which require a ready- made, low-cost and customizable operating system for high-tech devices. Android's open nature has encouraged a large community of developers and enthusiasts to use the open-source code as a foundation for community-driven projects, which add new features for advanced users or bring Android to devices which were officially, released running other operating systems.

Bluetooth:

Figure 3. Bluetooth

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks (PANs). Invented by telecom vendor Ericsson in 1994, it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization.

AVR Microcontroller

Figure 4. AVR Microcontroller

AVR Microcontroller is heart of the project. Embedded C language is used to do the programming. The AVR is a modified Harvard architecture 8-bit RISC single chip microcontroller which was developed by Atmel in 1996. The AVR was one of the first microcontroller families to use on-chip flash memory for program storage, as opposed to one-time programmable ROM, EPROM, or EEPROM used by other microcontrollers at the time.

SERIAL COMMUNICATION DEVICE

In telecommunication and computer science, serial communication is the process of sending data one bit at a time, sequentially, over a communication channel or computer bus. This is in contrast to parallel communication, where several bits are sent as a whole, on a link with several parallel channels. Serial communication is used for all long- haul communication and most computer networks, where the cost of cable and synchronization difficulties make parallel communication impractical.

Power Supply

The input to the circuit is applied from the regulated power supply. The AC input i.e., 230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier. The output obtained from the rectifier is a pulsating DC voltage. So in order to get a pure DC voltage, the output voltage from the rectifier is fed to a filter to remove any AC components present even after rectification. Now, this voltage is given to a voltage regulator to obtain a pure constant DC voltage.

Input LCD DISPLAY

Figure 5. Input LCD DISPLAY

A liquid crystal display (commonly abbreviated LCD) is a thin, flat display device made up of any number of colour or monochrome pixels arrayed in front of a light source or reflector. It is often utilized in battery-powered electronic devices because it uses very small amounts of electric power. In this project LCD Display is used for monitoring purpose.

IV BLOCK DIAGRAM

This project aims at designing and developing biometric finger print technology based money transaction system for shopping. As more global financial activity becomes digitally- based, banks are utilizing new technologies to develop next- generation identification controls to combat fraud, make transactions more secure ,and enhance the customer experience.

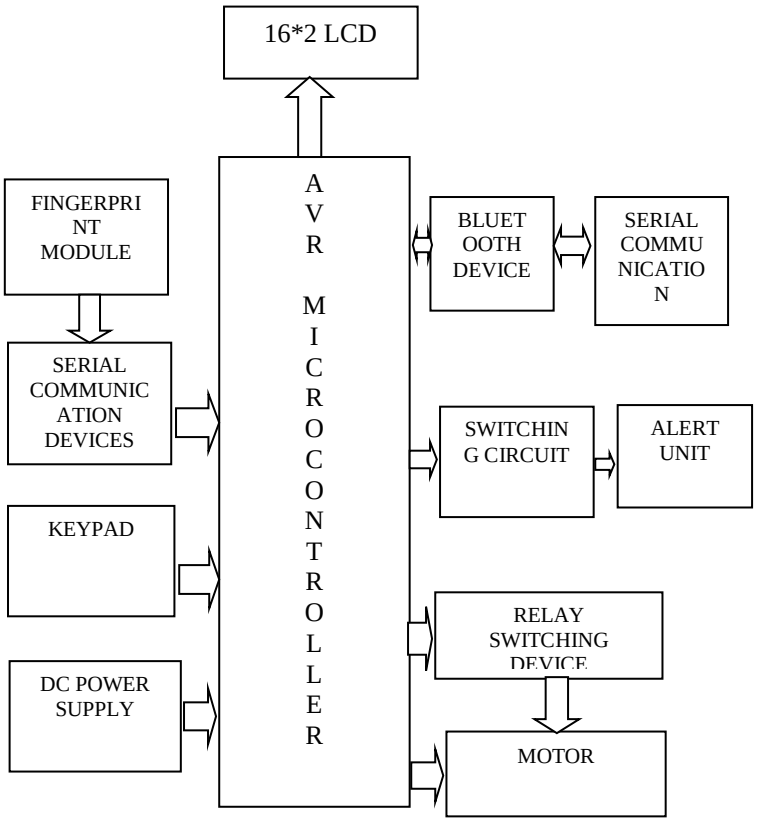
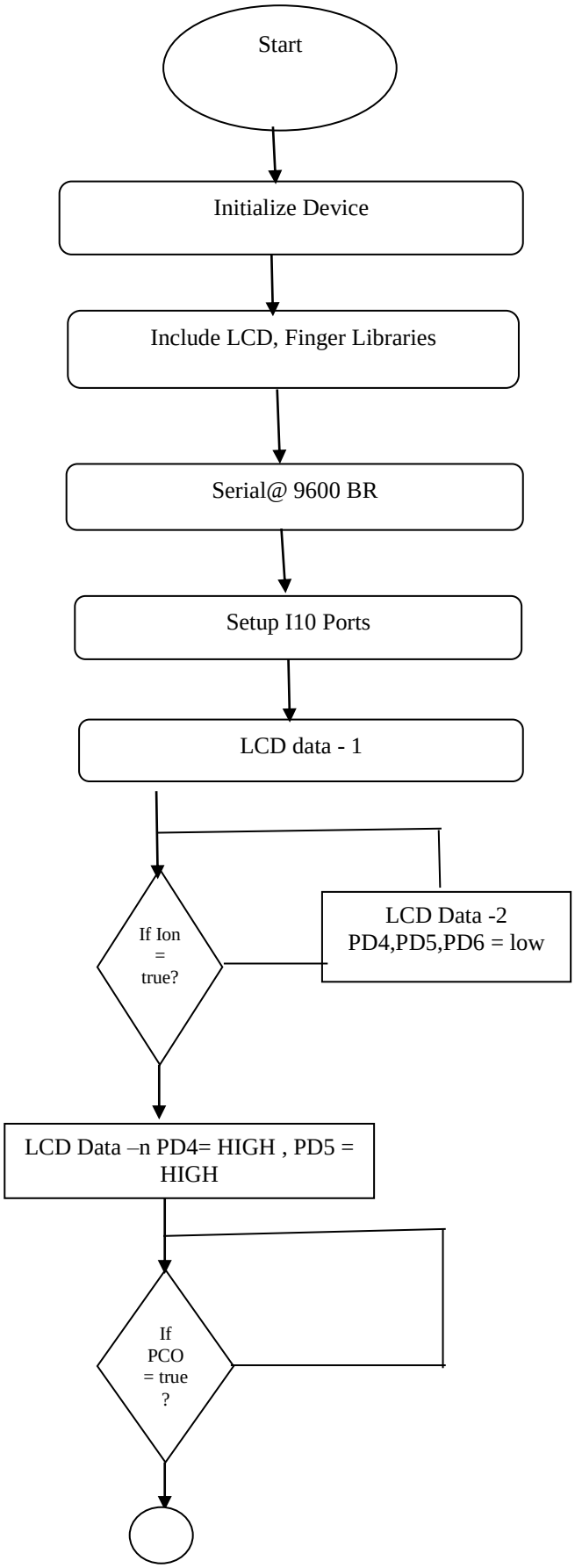


Figure 6. Block Diagram

Working Principle of fingerprint

Finger print processing includes two parts,fingerprint enrolment and fingerprint matching (the matching can be 1:1 or 1: N). When enrolling, user needs to enter the finger two times. The system will process the two timefinger images, generate a template of the finger based on processing results and store the template. When matching, user enters the finger through optical sensor and system will generate a template of the finger and compare it with templates of the finger library.

FLOWCHART:



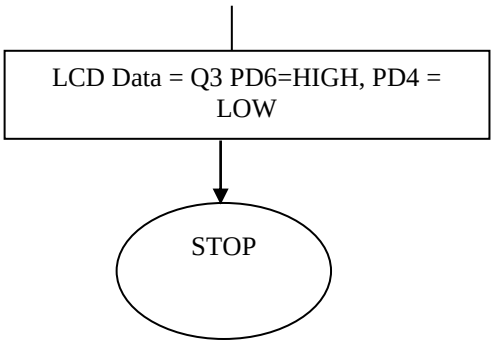


Fig 7: Flow Chart

APPLICATIONS

This project is used in following places: In all bank for Lockers, In all bank ATMs, In all Educational Institution, used in jeweller shops, In all Shopping malls, In all IT Sectors, In house,Schools treasury, Colleges treasury and in industries, VIP vehicles, in hospital, offices. Vehicle Security Applications.

FUTURE SCOPE

In addition to this the future scope of this project is to develop smart bank Locker security system based on "FACE", "IRIS and Retina" Scanning for visual identification of the person

CONCLUSION

The main goal of this project is to design and implement a bank locker security system based on Finger print. This can be organized in bank, offices and homes. In this system only the authenticate person recover the documents or money from the lockers. In this security system fingerprint is used. In this system first person enroll use name and password and mobile number. If user name and password matches then Finger of person will detect and store with ID. If the ID gets matches. So biometric and Bluetooth app security is more advantages than other system. This system can also create a log containing check in and check out of each user along with basic information. This E- Smart card can check personal details within 3secs, so we can save time & increase the fast processing of bank locker security with real time security password that is user defined can increase security authentication stronger. The AVR Microcontroller is used as heart of the project with ATMEGA-328 IC embedded C program is written using Arduino software. The AVR Microcontroller is reprogrammable,in the future we can enhance it for more security issues for related to Jewellery Shops,RBI, Aerospace, Defence, Navy, Hospital,.etc. AVR Microcontroller is re-programmable, so can enhance it more number of applications in future.

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