

IoT Based Bank Locker System using Finger Print and OTP

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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.. This system can also create a log containing check in and checkout of each user along with basic information.

Index Terms – Fingerprint, OTP, Arduino Microcontroller.

1. 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 prestored 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. In banking sector most, advanced technologies are not being used. Bank safety is an important issue at present. Our money is not safe in bank lockers when people cheat and misuse bank account and take unauthorized access to bank account. For safety

purpose locks or alarms are installed in the bank lockers. For the safety of bank lockers latest technologies are used. Designing of our prototype, involves the image comparing technique. Also, manpower used in managing these lockers is vast in banks whereas there are less people to attend to the consumers, banks can deploy more employees instead of wasting manpower in locker management system as our project will automate the locker system in banks.

2. 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 preprogrammed 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.

2. PROPOSED METHOD

The main aim 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

Block Diagram

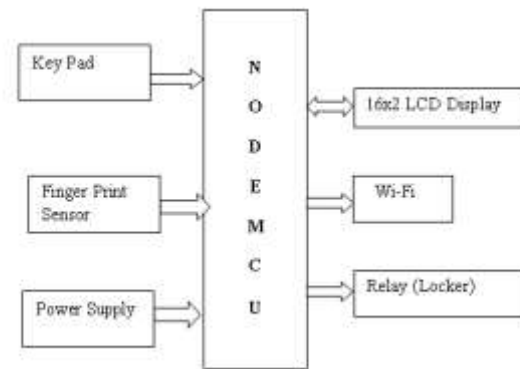


Fig.1 Proposed Block diagram

A. Finger Print Sensor

It is used for customers’ identification. So that there will be security for account identification. The fingerprint information is used as the standards of Identification. This is stored in data base.

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.



Fig. 2. Finger Print sensor

B. Key Pad

A keypad is a set of buttons arranged in a block or "pad" which usually bear digits, symbols and usually a complete set of alphabetical letters. If it mostly contains numbers then it can also be called a numeric keypad. Keypads are found on many alphanumeric keyboards and on other devices such as calculators, push-button telephones, combination locks, digital door locks, which require mainly numeric input. 4*4 matrix keypad is used to enter the OTP.

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.



Fig.3 Key Pad

C. 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.



Fig.4. Android smart phone

D. Arduino

Arduino is an open-source microcontroller board based on ATmega 328P. It has 16 MHz clock, 14 pins for an input/output purpose, USB connection, reset button and power jack. It contains everything which is required to implement or design the microcontroller based embedded system applications. In order to process the analog data

given by analog sensors it also contains 10 bit ADC (Analog to Digital converter). Moreover, Arduino has inbuilt libraries for almost every application.



Fig.5 Arduino Micro Controller

E. Wi-Fi

The WiFi module used in our system will help us to operate the web page for a customer.

The customer can set a particular threshold value to limit the meter reading through these which will be interfaced with the help of MAX232 to arduino board



Fig.6 Wi-Fi Board

4. EXPERIMENTAL RESULTS



Fig.7: Experimental Setup

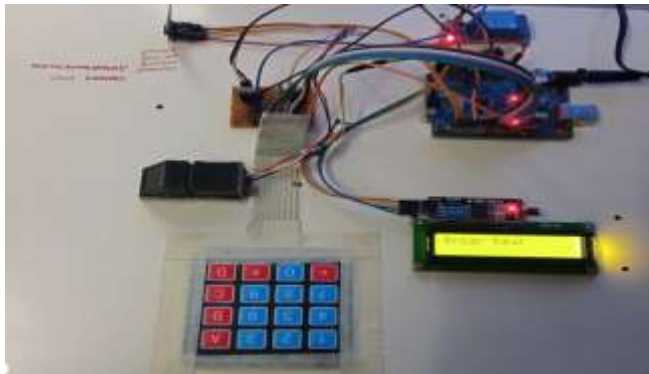


Fig.8: LCD showing that the asking Password which is Enter key

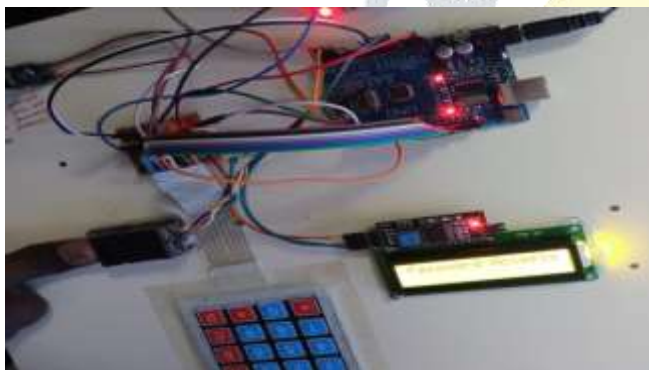


Fig.9: LCD showing the Password accepted after entering correct key



Fig.10: LCD showing that the OTP sent to mail after entering the password

5. 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 checkout 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.

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

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