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Bank Locker Security System Using QR Code

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ABSTRACT

Every human in this world majorly give priority to two matters one for his/her life and another issue is securing his/her property such as documents money, gold and many more. The essential motive of this undertaking is to graph the greatest safety system for bank locker using QR code technological knowledge, which furnish an impenetrable real and fundamental mechanism for operating safety lockers this can be prepared in economic group offices and residences, financial institution locker is the most secure location for the valuable things. This system rests on enhancing the present-day truth that all the lockers that operates presently operates only with the help of two special keys one the department head's key and the other the person key. Improvement towards the modern-day mannequin that depends closely on the key to the user is proposed which helps in the functioning of the locker with QR code basis. The primary aspects that are proposed in the new mechanism is the two-step verification process.

1)Details verification by the bank officials and allowing for opening bank locker with help of two keys

a) By universal key which holds by bank officials. b) By key which possess by user

2)Scanning of QR code which was provided by bank to the user

The machine employs an ESP32cam module. It contains many GPIO pins which is programmed to act as an internet server used to scan QR code .The gadget additionally employs a L293d is a regular motor driver IC which permits a DC motor which operates the closing and opening of a safety locker door.

Keywords: QR code, ESP32CAM, L293d driver IC, Authentication, Key Safety Lockers**.**

Introduction

The Bank is an institute where we secure our money and other valuables. Where there is cash there are thieves, nowadays there are extra instances of burglary so securing financial institution has end up very important. Due to development of technology by day by day the focus on improving security for safety things. With developing improvement in electronics security device today all guide locks are changed through digital devices.

We have many security providing systems like password, fingerprint scanner, iris scanner, face recognition, QR code, RFID scanner and many more.In our system we used QR code security system for bank locker.In olden days people are not connected much with QR code system. But in present scenario QR code became most popular for security and transaction purpose such as Google Pay, Phone Pay and so on.

The QR code Based Bank Security System fulfills all these requirements. Bank officials will verify the person details, the user should give his/her details such as account number and registered mobile number which was given by bank officials to the database.The database will authenticate the user. The QR code will created by the details provided by the account holder. By scanning the QR code created by the system. System will test first the user is legitimate or not by means of retrieving records from the database. Then enable using personal key to open the most important door for the licensed person. It will provide extraordinary methods to inform the security officials about unauthorized person access i.e., using alarm machine and LED.

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Problem Statement

In present days world protection plays an essential role everyone has valuable accessories like gold, documents, or cash. In current days most of the banks are using key locker system which is a very oldest method. Whenever a person needs to open the locker, he needed to be verified as a customer by the bank officers. To open the locker, he needs to wait for the officials to open the universal key. It leads to time consuming or wasting of time. If they use pin/pattern system the person needs to remember that e pin or pattern, whereas some of the person's cannot be able to remember that pins/patterns, this may lead to some problems to the users. The pin/pattern can be hacked. If any illegal member (or) some security pin/pattern forgotten people accessing the locker means, then it will not alert the bank officialswhereas in our project the buzzer will alert the bank officials by the alarm if an illegal member access the locker. So, we needed the improvement of security forthese lockers to be ensured and to be updated to the current technology. We often hear or examine in newspaper that some pretend character has get admission to the locker of some other man or woman and have stolen cash to overcome this type of frauds, we are attempting to enhance the financial institution locker protection by means of using QR code gadget.

Literature Review

Ms. SayleeBegampure, Priyanka Patil [1].In this framework they developed motion detection and gsm module for bank security system. Because in this gadget financial institution will acquire the biometric records of each person for having access to the lockers because in this gadget only authenticated character recover the money, files from the lockers.

Lokesh M. Giripunje, SuchitaSudke, PradnyaWadkar [2]. In this framework they developed three stage security system those are, verification of username and password and accessing the financial locker by using Fingerprint and One Time Password is generated by GSM.

D. NagaRani, B. Samba Siva Rao" [3]. In this paper they developed Bank locker system used the RFID and GSM, two password verification system and it is most secure due to double password system.

Mary Lourde R and DushyantKhosla [4].They says perhaps the most essential application of right private identification is securing limited get ideal of entry to buildings from malicious attacks among all the existing employed biometric techniques fingerprint scanner constructions have acquired the most attention due to long facts of fingerprints and their large use in forensics this paper provides with the trouble of dedication of an top of the line algorithm for fingerprint matching in order to format the computing system that suits required in traditional average overall performance and accuracy.

P. Sugapriya, K. Amsavalli [5]. Initially pattern drift is amassed as datasets and maintained in financial institution agent server. The computing device has a digicam to seize the pattern go with the flow of consumer and dispatched for processing elements of the logic have been in contrast and consumer where recognized. In addition to the authentication of consumer there is some other system to pick out the consumer before that RFID tad checking is needed. Image processing

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is used, and keypad password is wanted for any other level of security. In future bank can enforce this kind of authentication choice for banking and from this project shows that all the financial institution accounts can be accessed besides the use of playing cards through this face focus efficiently and safely.

Ajit S. Mali, Manali A. Mahalungkar, Pradnya C Jadhav [6]. In this framework they developed Bank locker security system of Anti phishing System using QR code technology. They used the method of auto generating QR code. They had developed an Android application which is used to store all images of QR codes. Image decoding is done with the help of JAVA applications.

Abhilasha A Sayar , Dr. Sunil N Pawar [7]. In this framework they developed Financial institution locker security system using RFID and GSM technology. It is a wireless technology which detects objects with help of radio waves. This tag will contain the information about the bank locker holder like account number, locker number. This system is purely on the embedded system.

Akshaya R.kPavan.K Mohan Reddy [8]. In this framework we are using voice recognition module, MATLAB. Face recognition with live image capturing. we have used ARM7 processor so that it can be integrated with many peripherals.

Sagar S. Palsodkar, Prof S.B. Patil [9]. In this consider paper we will beautify biometric (finger or face) and GSM technological facts for monetary organization lockers. Because in this machine financial group will acquire the biometric facts of each character for gaining access to the lockers due to the truth in this system solely authenticated persona get higher the money, archives from the lockers.

J.S Vimali, SenduruSrinivasulu, Gowri. S [10]. In the consider paper we used micro controller, PIR sensor, Fire sensor. The safety will be provided through camera and give security by taking three control exercises. SMS will be executed using GSM module.

Methodology

Bank lockers are a common in our daily life. Yet, we still rely on traditional locker opening that use physical keys that bring with it many problems such as key duplication from photos and lock-picking. There are also costs associated with making keys. Next to this new methodology have been implemented that is pin security system. This system also consists of some flaws such as password can be hacked or decoded by anywhere, and it may be forgotten.This security system consumes high power.More number of wrong pin entries maylead to freeze the account.This may cause problem to the legate person.

Proposed Methodology

In this project we advocate a QR code primarily based invulnerable access which can supply a state-of-the-art theft alert system for a bank locker system. The manner and flow chart given beneath includes an esp32 CAM module interfaced with Webcam, L293D driver IC, CP2102 chip, LEDs, and buzzer. When an individual needs to take the report or something else from their locker the user wants to scan his QR code using a webcam to verify that the user is a

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purchaser of that bank. Once the records are examining the QR code details is compared with the database. If this fit, then the character asked to give key to liberate the door. If this suit then consumer receives get right of entry to draw the desireddocument, if does not then there is no possibility to open the door. By the usage of QR code which was provided we want to scan with ESP32 camera if it validated successfully System will look at first the consumer is legitimate or not via retrieving facts from database. Then the usage of non-public key to open the foremost door for approved person.The person should provide his personal details while creating an account which should be more secure and personalized.

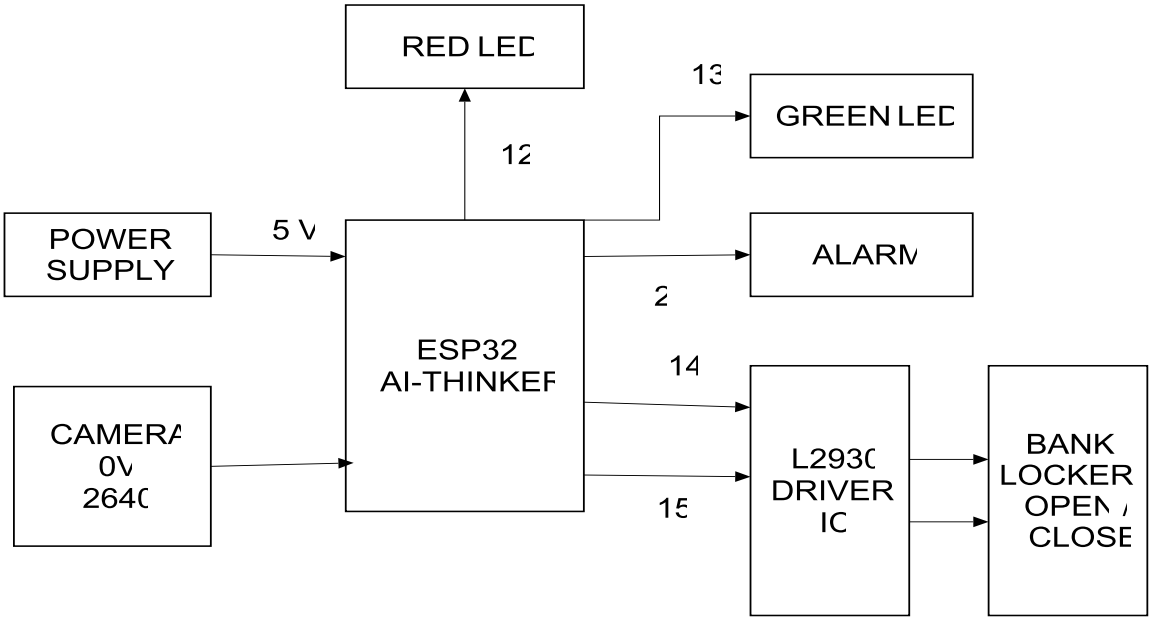


Figure 1. Block Diagram

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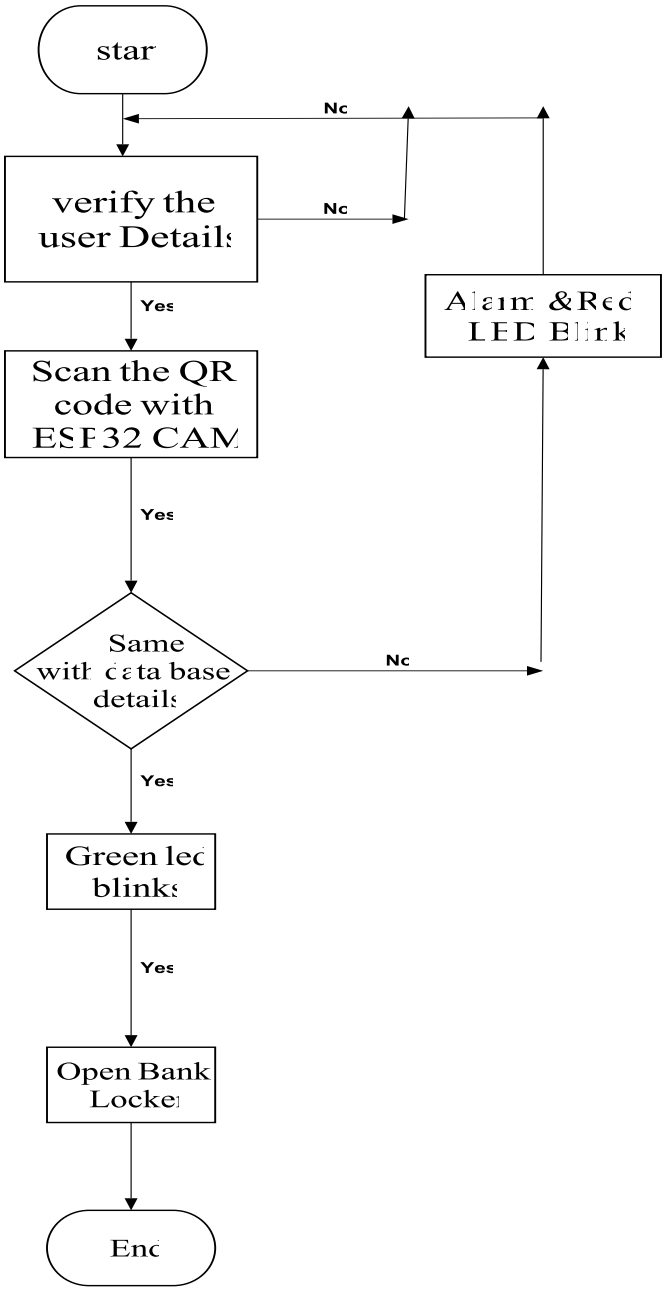


Figure 2. Flow Chart

Algorithm

- Start the program.
- Bank will verify the user details.
- The QR code will be created with the help of person info such as name,phone number or account number.
- Provide the QR code to scan with the ESP32 CAM.

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- Financial institution database compares the personal details with the QR code info to verify whether the locker belongs to legate person or not.
- If data base details and QR code details matches, then the locker will open.
- Then green LED will glow this indicates that user accessing the locker is authorized.
- If QR code is not valid then buzzer will be on and it is like a notification that an unauthorized person willing to access the bank locker.
- Not only the buzzer but also red LED will glow this also indicates user accessing locker is unauthorized.
- End the program.

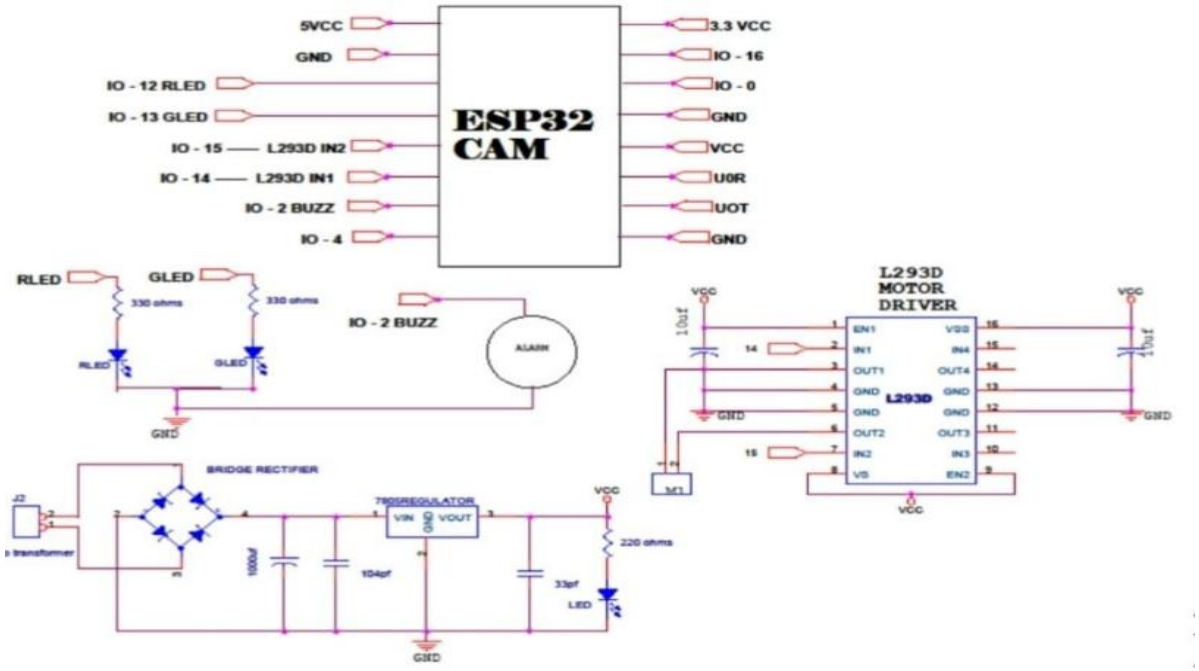


Figure 3. Schematic view

Components and Figures

ESP32 CAM

The ESP32-CAM is a full-featured microcontroller that moreover has an integrated video virtual digital camera and microSD card socket. It is greater powerful and handy to apply and is good for IoT devices requiring a digital camera with maximum dependable factors like picture graph tracking and recognition. ESP32-CAM is a low cost ESP32-primarily totally based development. board with onboard camera,small. It is an excellent solution for IoT application, prototypes structures and DIY projects.

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Figure 4.ESP32 CAM

L293D DRIVER IC

The L2933D IC consist of 16 IC pins.It consists of 8 pins on each side.Both sides consist of same set of pins which are VCC(2),Enable pins(2),Input pins(4),Output pins(4),and 4 grounds.It is used to drive two DC motors with same IC.If we use only single DC motor means we can use either side of the driver IC.



Figure 5.L293D DRIVER IC

The enable pins are used to provide inputs.[1,9]
The output pins are connected to a motor.[3,14]
Input pins control the corresponding output pins[2,7,10,15].
Vcc pins are connected to the powersupply voltage for the working of motor.[8,16]
Ground pins are connected to the ground. [4,5,12,13]

QR code

Quick response is a dual directional bar code. It contains information in both horizontalas well as vertical direction in the provided image.This code is machine readable it analysis the information contains in it. QR code can be generated by help of numeric,alphanumeric, special characters.QR code has fast readability and has huge storage capacity than bar code.QR code structure looks like consisting of black squares on white background,QR codes can be readable by wireless devices such as image capturing devices.

Table 1. Comparison with different scanners

Characteristics	Facial Recognition	Voice Identification	Iris Scanning	Fingerprint Identification	QR Code Scanner (Proposed)

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Accuracy	92%	90%	95%	94%	97%
Devices required	Camera	Microphone	Camera	Scanner	Scanner
FRR	7%	8%	4%	4%	2%
FAR	1%	2%	1%	2%	1%
Verification time	5 seconds	6 seconds	<5 seconds	3-5 seconds	<3 seconds
Cost effective(rupees)	14850	5661	9000	9500	3000
Power consumption	62mW	30mW	35mW	32mW	160mW
Storage capacity	4 kilobytes	3 kilobytes	0.5 kilobytes	2 kilobytes	3 kilobytes

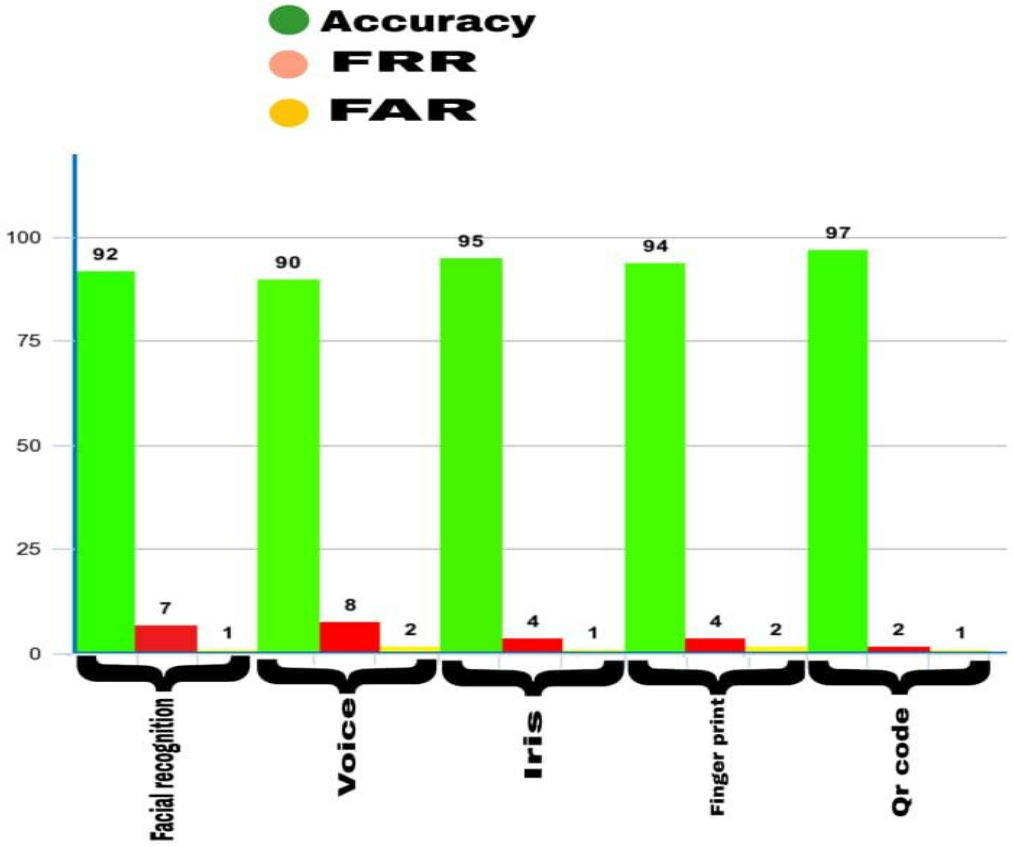


Figure 6. Comparison Bar Chart

Table 2. Comparison between existing and proposed work

Characteristics	Facial Recognition	Voice Identification
Cost effective	Low	High
Range of Reading	Several inches to a foot, Extremely fast scanning	Up to 30 feet, Low
Power consumption	Low	High
Storage capacity	5 kilo bytes	2 kilo bytes
Continuous scanning	Fast and accurate	Somewhat less compared to QR code scanner

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Labor intensive	Yes	No
Accuracy level	>90%. QR codes care much accurate.	80-90%. Sometimes not as accurate or reliable as barcode scanners
Capacity	High data encoding	Low data encoding
Security	Has no security flaws and cannot be hacked	Consist of some security flaws and it can be hacked



Figure 6. Hardware Setup

Result

In our paper, we used the QR code-based security system.This became most popular in present days because it is most easy for using and consume less time for detection .It will be additional feature for the existing system by this the security level will be enhanced for existing model.It is a low cost and effective and less power consumption. Accuracy is more for this type of modeland storage capacity also little high while compared to others.Moreover, it will read other languages also like Chinese and Japanese languages. This system robbery of lockers will be reduced. Unauthorized users can be easily notified in our proposed work.

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