BANK LOCKER SYSTEM WITH IRIS ENROLLMENT SECURITY

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ABSTRACT-

The main aim of this paper is to provide an efficient way of security for banks. Here we have implemented a better stage of security of money in the bank locker, house, and office (treasury). This paper proposes a method to integrate iris recognition with the RFID card to develop a high security access environment. Its main feature is that the iris of individuals is unique even for twins.

Using iris recognition in Bank Locker System, a customer simply has to first show his RFID card and then enter the account number. Place eye in front of the scanner. When account number and iris image is matched with the record stored database, the customer can access his locker. Thus, it provides a high degree of security. Moreover it does not require physical contact with the camera here and hence the health issues are minimized.

Keywords: Locking system, Keyboard, Microcontroller, iris scanner, RFID.

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I. Introduction

Security is very important issue in every prospect like banking system, office purpose, military purpose etc. Only the authorized persons are allowed to enter in the locker area by using their identity cards. Unknown persons may mislead them by stealing their ID cards if they know their password/user id/account number. But in this context we have implemented safety of the money in the bank locker, house, and office (treasury) in an advanced way i.e. by using biometric technology which will be more secure than other systems.

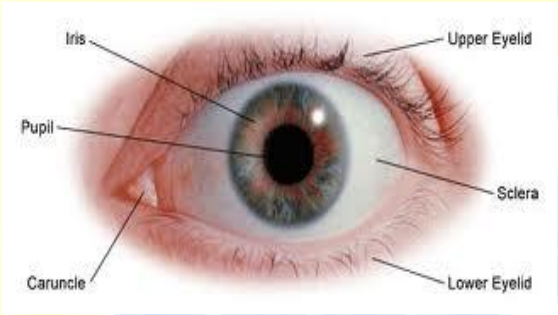

Figure 1: Parts of human eye

In this, first of all the user is required to verify himself by his iris pattern. The system is designed in such a way that initially the users are required to enrol their iris patterns that is saved in the database. After that the user shows a RFID tag to the reader, it will check if it is a valid one and then the user is required to enter the correct password/user id/account number. If the password is incorrect the red LED will be ON and if the password entered is correct, the controller will open the locker and the user gets the access.

In short if all the credentials are correct with the authorized person then he or she will have access to that particular accessories or things and the process continues.

II. Literature Survey

The existing security systems are not enough as they can be easily faked by the smart larceners as they can get hold of the keys or the passwords. Also it's a painstaking job for the administration of the banks to keep an account of the locker activities as there is no dedicated employee appointed for this. To get rid of these issues, bank security system like this one is needed where there is no requirement of any manual presence of the officer. This helps in the

reduction of waiting time of the customers. They are also given a unique password and another password is any registered proof. They are also supposed to give alternatives to all the above samples so that it can be used to access the lockers in case of any mishap. There are many sensors like sound sensor, light sensor which operates after the working hours means in night time they helps in safeguarding the locker area for any theft or interference furthermore.

III. System Design

To design such a system, there is a need of both the hardware and software. Here we have used AVR (ATMEGA 16) microcontroller which is high performance, low power 8 bit microcontroller which has further used an RFID module for getting an access to the customer's locker, electromagnetic and solenoid locks are used for the automation of opening and closing the locker doors. With this a three level security is established which is very effective:-

First level security: A common iris scanner for all the users.

Second level security: It has user id/password/account number and is different for different users.

Third level security: It has RFID card reader. This is different for different users.

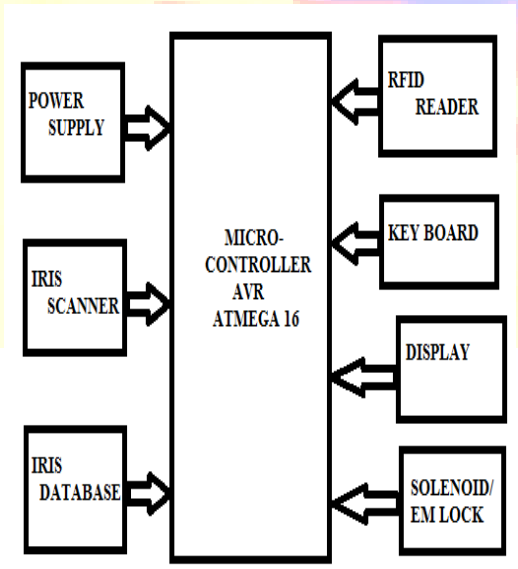

Figure 2: Block diagram

Radio Frequency Identification (RFID):

Radio-frequency identification (RFID) is the wireless non-contact use of radio-frequency electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. The tags contain electronically stored information. Some tags are powered by and read at short ranges via magnetic fields (electromagnetic induction). Battery powered tags may operate at hundreds of meters. Unlike a bar code, the tag does not necessarily need to be within line of sight of the reader, and may be embedded in the tracked object. RFID tags are used in many industries. An RFID tag attached to an automobile during production can be used to track its progress through the assembly line. Pharmaceuticals can be tracked through warehouses. Livestock and pets may have tags injected, allowing positive identification of the animal.

Since RFID tags can be attached to cash, clothing, everyday possessions, or even implanted within people, the possibility of reading personally-linked information without consent has raised serious privacy concerns.

Iris Scanning

A flat, coloured, ring-shaped membrane behind the cornea of the eye, with an adjustable circular opening (pupil) in the centre is known as iris which can be used as an aspect for security purpose. The unique pattern in the human iris is formed by 10 months of age, and remains unchanged throughout one's lifetime i.e. it is stable. The probability of two irises producing the same code is nearly impossible, hence it provides uniqueness. A distinctive iris pattern is not susceptible to theft, loss or compromise which makes it reliable to use. Digital images encoded from these patterns by mathematical and statistical algorithms allow the identification of an individual or someone pretending to be that individual. Databases of enrolled images are searched by matcher engines at speeds measured in the millions of templates per second per (single-core) CPU, and with infinitesimally small False Match rates. All the above properties of an iris relate it to the security environment and can be used successively.

Iris scanning measures patterns on the coloured part of the eye - the iris. The tissue has a unique pattern of markings which does not change and is different for each eye. Iris scanners read from the outer edge towards the pupil, detecting and plotting the markings. Data is saved and stored within a chip, on a passport or ID card for example, which will be verified when the eye is

scanned in future. While iris scanning is fast and accurate, its accuracy can be affected by objects obscuring the eye and may not be suitable for people with cataracts.

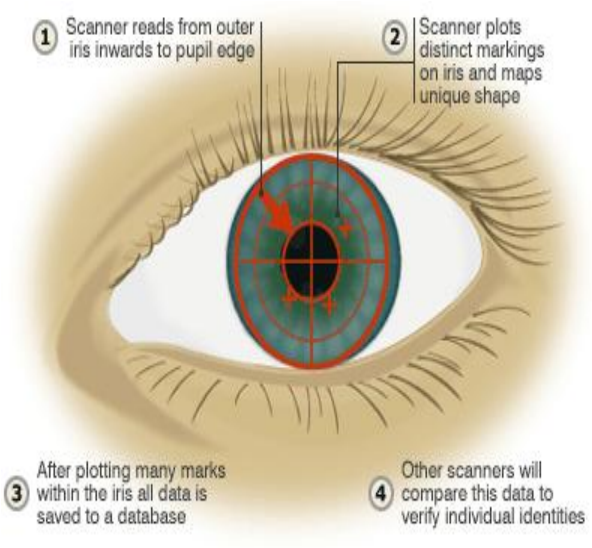

Figure 3: Identity recording by iris scanner

Microcontroller (AVR ATMEGA 16)

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. It combines 16KB of programmable flash memory, 1KB SRAM, 512B EEPROM, an 8-channel 10-bit A/D converter, and a JTAG interface for on-chip debugging. The device supports throughput of 16 MIPS at 16 MHz and operates between 4.5-5.5 volts. By executing instructions in a single clock cycle, the device achieves throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed.

Figure 4: Iris scanner

IV. Flow Diagram

The flow diagram of the proposed system is shown in figure 5.

The steps followed in the proposed system are described as below:

i) The first step is that the authorised user shows his identity card.

ii) If the card is valid, the subsequent operations will take place otherwise red LED will glow. This will show that the card is not valid.

iii) Now, the account number is entered. This could consist of numbers and alphabets. It is entered through a keypad.

iv) If the account number is valid the subsequent operations will take place otherwise red LED will glow. This will show that the account number is not valid.

v) Now the next operation is iris scanning.

vi) If the iris pattern is of authorised user, the locker will open otherwise the lock will not be opened rather the LED starts glowing.

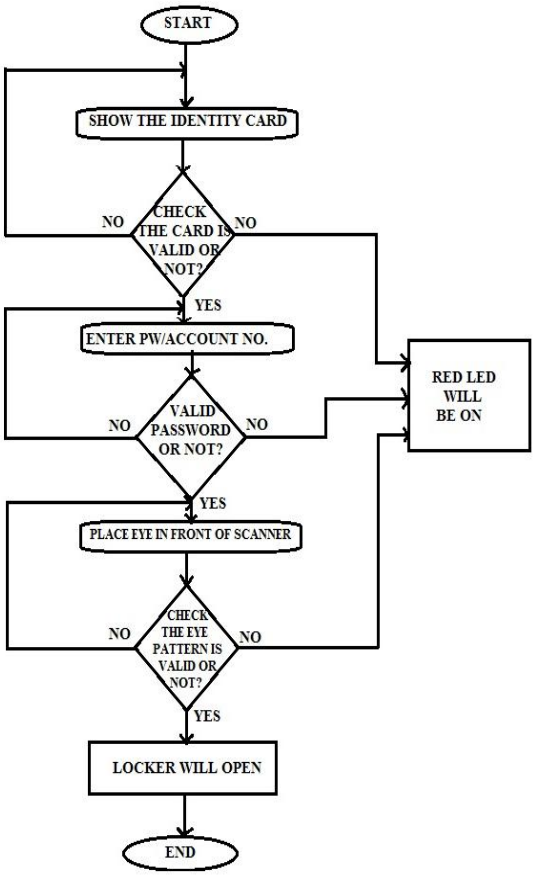

Figure 5: Flow diagram

V. Applications

The proposed system finds application in the following areas:

- High Security in the Bank Transactions.
- Passport Verification.
- Person identifying.
- Military Application.
- CBI verification.
- Educational universities.
- Security systems.

Conclusion

The ID Authentication System based on Iris identification proves to be very effective in providing security. A step by step approach in designing the id authentication system based on iris identification giving security to the users banking system and providing the security for the locker system using iris scanner can be done. The result obtained in providing the security is quite reliable in all the three modes.

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