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A HIGHLY SECURED FINGERPRINT BASED BIOMETRIC ATM AUTHENTICATION SYSTEM

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Abstract – *The main purpose of our system is to make online transaction more secure and user-friendly. Now days, Biometric technology is increasing rapidly. Biometric is used for personal identification. Here we are using Fingerprint scanning biometric to provide access to ATM machine. Data of a fingerprint is stored in database using the enrollment process through the Bank. Bank provide authentication to the customer that can be access while performing transaction process. If fingerprint match is found in data base then transaction take place. After verification, if fingerprint does not match transaction will be cancelled. Using fingerprint based ATM system user can make secure transaction. Biometric can be used to identify physical and behavioral characteristics of user fingerprints. There are many biometric devices like iris detection, face recognition, fingerprint. In our Project, we are using fingerprint biometrics. Users fingerprint are scanned using biometric trait and stored in database. All fingerprints have unique characteristics and patterns. A normal fingerprint pattern is made up of lines and spaces. These lines are called ridges while the spaces between the ridges are called valleys. Fingerprint biometrics are easy to use, cheap and most suitable for everyone. Characteristics of fingerprint vary from person to person. Fingerprint is a unique identity of user.*

Key Words: **Arduino uno**, **fingerprint biometrics, fingerprint sensor, GSM module, LCD display, etc.**

1. INTRODUCTION

Fingerprint recognition is one of the most dependable and promising personal identification technology. Fingerprints play an important role in biometric system. In biometrics technology, fingerprint authentication has been in use for the longest time and bears more advantages than other biometric technologies. Fingerprints are the most widely used biometric feature for an individual identification and verification. We have proposed fingerprint verification of ATM security system using the biometric with hybridization. The fingerprint trait is chosen, because of its characteristics like availability, reliability, and high accuracy. The fingerprint based biometric system can be implemented easily to secure ATM machine. In this system the working of these ATM machine is when the customer places his finger on the fingerprint module when he needs to access the ATM to withdraw the cash then the machine processes the fingerprint of the user. With the help of biometrics, it verifies and identifies the fingerprint and gives accurate result that if it is valid or not. In this way we can try to control the criminal activity of ATM and secure it. The present scenario to operate an ATM is with digital locks that have keys, individually biometrics lags behind in providing hundred percent protections. To provide perfect security and to make our work easy we are using two different technologies i.e. Biometrics with Embedded system. First of all we are gathering the information related to Fingerprint enrollment phase. This module is interfaced with the controller so that the user should store the images when accessing the ATM and when accessing the ATM if images match only then the transaction can proceed further.

1.1 Objective

In this proposed system, to replace the existing card system of ATM transaction with biometric fingerprint. The development of this Technology, it offers a secured and faster ATM services to users through accurate matching of fingerprints. In the real time, the fingerprint scanners can be also employed at POS machines for payment of bills in shops.

1.2 Problem Statement

In the existing system, we use a debit or ATM card at an ATM, individuals can withdraw cash from accounts, make a deposit or transfer money from one account to another or perform other functions which is not highly secured.

2. PROPOSED SYSTEM

In this project Arduino-uno microcontroller is used which controls the entire fingerprint based ATM system by the instructions fetched in it. The fingerprint sensor will takes the fingerprint of the finger and convert it into the hexadecimal number by ZEM 510, which is present inside the fingerprint sensor. This sensor send the hexadecimal value to the Arduino that compare that value with the values stored in it. If the value matches then the Arduino will send the information related to the fingerprint i.e, the account holder name and other transaction details through the 16x2 LCD. After the transaction is over the GSM module will send the notification to the registered

mobile number.If the fingerprint does not match buzzer will make sound and GSM module will send the alert message to the corresponding bank.

Advantages of proposed system

- The use of fingerprint as a password has made the ATM transaction system more secured and reliable.
- Moreover the system is built on embedded technology which makes it user friendly and non-invasive.
- By recognizing the fingerprint it can access the account without using the credit cards.
- The transaction will be faster and the user will receive a notification after every transaction.

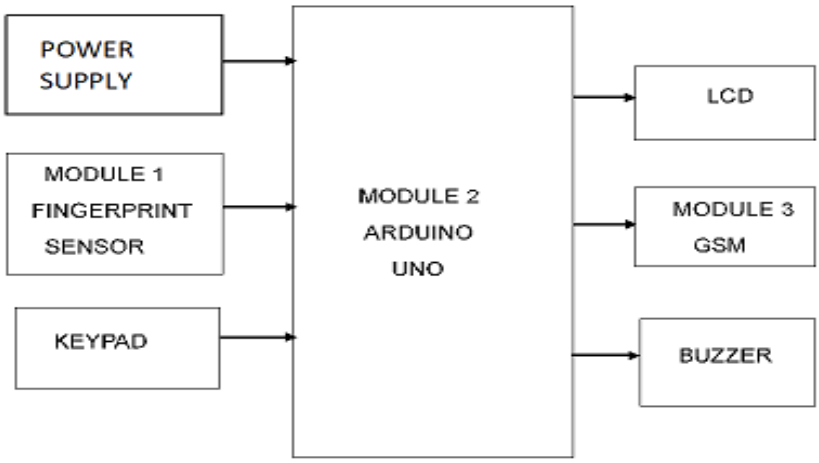

Fig -1: Block diagram of the system

2.1 ALGORITHM AND WORKING PRINCIPLE

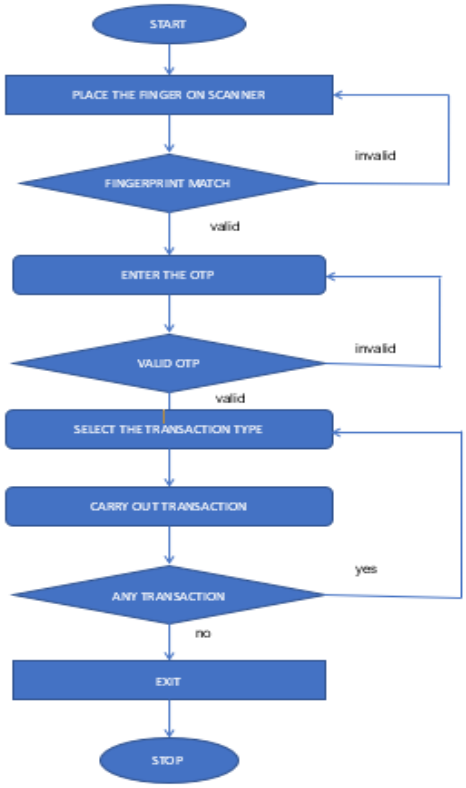

Fig -1: Flow chart of the system

When the system is powered on, the user can place the finger on the fingerprint sensor and the sensor starts scanning the finger and once the finger is scanned the scanned fingerprint is matched with the fingerprints stored in the memory. If the match found, the GSM module will send the OTP to the user mobile number. If the OTP is valid then the user allowed for the transaction. If the fingerprint match not found, process will stop and the transaction get exit and the buzzer starts rings, the GSM module will send the alert message to the bank and respective account holder number.

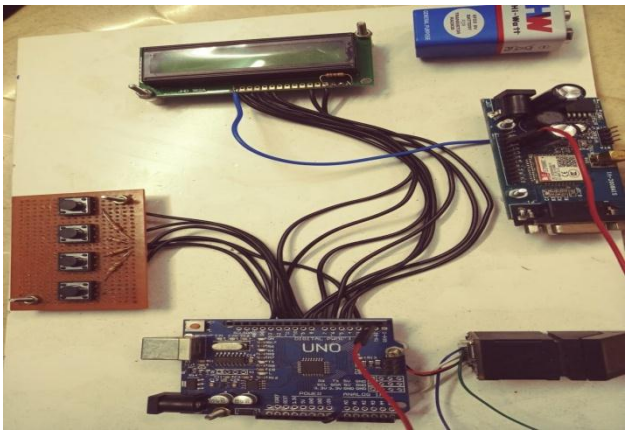

Fig -2: Overall image

3. CONCLUSION

There are many possible misuse for the ATM card using pin. This project uses the fingerprint for authentication. This project aims to provide more security to the ATM users. Fingerprints are unique for every individual and thus provide high authentication. The system is built on embedded technology which makes it user friendly and non-invasive. Fingerprints are being gradually integrated in variety of applications like government applications such as AADHAAR and forensic science applications such as criminal enquiry, corpse identification.

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