Cardless Banking System using GSM and Biometric Authentication

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ABSTRACT

The purpose of the paper is to get rid of traditional bugs and to implement the cardless transaction system. Nowadays ATM card, challan, a credit card is used for the purpose of money transaction. Implementing of cardless banking system help us to overcome the drawback such as losing of a card, fetching a new card, forgetting of card and no need to maintain cards. This can be done by using Biometric authentication and GSM technology.

Keywords: Biometric authentication, GSM, Cardless transaction, Arduino Uno, Embedded C, ATM card, Node MCU.

I. INTRODUCTION

Money transaction is the necessary process, used to purchase goods, investment and then online shopping. Every individual has their account in a different bank and having multiple cards to a respective bank account. Most of the people uses ATM card which is made of magnetic stripe for purpose to store the bank details of the customer. It is not safe and the card is difficult to maintain.

Implementation of a cardless banking system using GSM and Biometric Authentication is the only solution to get rid of the above difficulties. In a cardless banking system, the transaction can be made easy after storing the customer fingerprint and the bank account. Then automatically the system assigns a respective fingerprint to a particular bank account and it allows the customer whose fingerprint is stored initially. The authentication and the validation are done only after checking the fingerprint. Then a selection of bank account takes place.

II. RELATED WORK

[1] The concept of Cardless Banking system was first introduced by G.R.Jebline and S.Gomathi by the method of Binarized Fingerprint images and Grayscalefingerprint which has a disadvantage in identifying core points.[2] then, yung yang implemented a ATM Terminal design which has a disadvantage such as noise.

III. METHODOLOGY

Existing System

The existing system for the transaction is a fully pin code-based process which means the process can be done by entering the pin code. Debit cards, Credit cards and ATM card are examples of the existing system.

Limitations of Existing System

- It is not secured and it can be easily hacked.
- Difficult to fetch a new card until getting a new card.
- Difficult to maintain a new card. There is a possibility of breaking a card, forgetting of password
- It is difficult to remember all the pin codes. If the person is having multiple bank accounts it is difficult to remember the entire password.

Proposed System

Implementing a system instead of an existing banking system using Biometric authentication and GSM-based technology. The purpose of GSM in the cardless banking system to receive 4 digits code one time password and also used to ensure the authentication process. Here complete transactions and multi-banking can be done by a single touch. Then fingerprint authentication and validation is used instead of using the cards.

Advantages of Proposed System

- The Transaction can be done in a single touch.
- It is safe and secure.
- No need to carry cards.
- Provide facilities to do multi-banking without the usage of cards
- It is easy to access
- No need to remember the passwords as we are implementing a cardless transaction.

Hardware Description
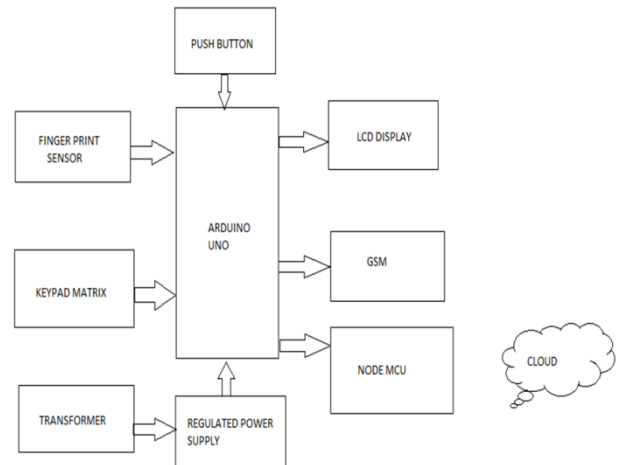
The system uses a fingerprint sensor, Node MCU, arduino, GSM, regulated power supply, Transformer, push button and LCD.

Power Supply

A power supply is also known as a PSU that supplies electric power to a group of loads. It is commonly applied to electrical energy supplies. It is a unit of transformer, rectifier, filter and a regulator which are used to provide voltage supply to the devices.

The voltage runs in a range of 230Vrms and is connected to a transformer which helps in stepping down a voltage level.

Transformer

The Transformer is commonly used in either stepping-up or stepping-down the AC voltage. In this cardless banking system, the transformer is used in stepping-down the AC voltage. It is regulated at 5V.

Rectifier

A rectifier is a device like a semiconductor that is used to convert the sinusoidal input waveform to a unidirectional waveform. It is converted into a nonzero average component.

Filters

Capacitors are used as a filter. It is used in the power supply unit. During the period of conduction, the capacitors store the energy and then during the non-

conducting period, it delivers the energy to the load. In this way, the current passes through the load.

Voltage Regulator

The LM78XX is a regulator which has three terminals. It is available with several fixed output voltages.

Arduino

The Arduino Uno is a microcontroller that is based on a ATmega328. It has 6 analog inputs, 14 digital inputs pins Or 14 output pins. It is used in the most projects.9V power supply is used and can be powered by the USB cable. It can be connected to the computers. The Crystal oscillator used in the arduino helps in the dealing of time issues.

Node MCU

Node MCU is an open-source IOT platform that is low   in cost. It runs on the ESP8266Wi-Fi.

This microprocessor supports RTOS and operates at 80MHz to 160MH adjustable clock frequency. It can be powered using a micro USB jack and VIN pin. It supports UART, SPI and 12C interface.

Major applications
- Home applications.
- Home automation.
- Mesh network.

GSM

The GSM system is a digital network. It is used in the mobile phones, remote monitoring and as securing system. It is used as a part of embedded system.

LCD

LCD is a display used in digital watches which has a polarizing material with liquid crystal solutions. A light is not passed through it because it aligns the crystal.

Push Button

A push-button also called a simple switch. It is a mechanism to control some aspect of a machine or a process. Buttons are typically made out of hard material usually plastic, so as to be easily depressed or pushed. Buttons are most often biased switches.

The "push-button" has 3 wires which are connected to the arduino. Here the push button acts as a switch. It can be connected by using the jumper wire from pin 5.

Fingerprint Sensor

For the past few years, fingerprint detection utilization has existed for identification. Ridges, whirls and loops differs from one person to another person and unique to every person. Fingerprints are classified into five types namely whorl, right loop, left loop, tented and arch.

Software Requirements

Embedded C is the most popular and most commonly used in the development of embedded systems. It is the most popular language in the embedded system.An Embedded System is software and hardware based and is designed to do a specific task. A Microwave oven is an example of an embedded c.

IV. EXPERIMENTAL RESULTS

Security

The cardless banking system is fully secured as we are implementing fingerprint authentication. Every person's fingerprint differs from the another person.

Future implementation

In future, even it can be implemented in an existing ATM system for the purpose of the multi-banking transactions. It is more convenient to get instant money when we implement it in an ATM system. It is mainly used for blind peoples as it is fingerprint based authentication and validation. While implementing

an ATM system the cloud will be used to store the infinite bank accounts of the customer in a data server.

Validation and Authentication

The validation and the authentication process are done by checking the fingerprint of the customer and then after receiving the OTP in the mobile by using GSM technology. In case, if the mobile phone is not available with to customer, there existing a way of entering the password.

V. CONCLUSION

Hence the cardless banking system using GSM and Biometric authentication provides security and replace the existing bugs such as forgetting a password, losing of cards and carrying multiple cards.

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