Biometric Fingerprint Recognition For Bus Ticket System

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Abstract:- Smart cities growing very fast, everything is getting digital. Government has now declared to go cashless. The proposed system is supportive to the idea of going cashless. Today ETM systems are being used in bus for ticketing purpose. ETM's ask for source and destination and prints the ticket as per the fare associated with the route. So while travelling the passenger has to pay for the fare, it happens that the passenger does not has exact amount to pay. This makes mess of collecting money. To overcome this problem, we are adding biometric module to the existing ETM that will also help to carry out transactions digitally.

Keywords :- Arduino UNO, Electronic Ticketing Machine (ETM), UID, Global System for Machine Communication (GSM), Fingerprint Module, Mini Thermal Printer, MySQL Database, Security.

I. INTRODUCTION

Nowadays, transportation has become very hectic for people travelling via bus. The transport systems are not in favor when it comes to payments of the tickets made while travelling. [1]

The tickets fare is an odd number that creates chaos in the bus while asking for a change to the conductor or the traveler.

Our System Overcomes the problem of keeping change either with the conductor or the traveler. Registering will help the traveler to travel anywhere by bus digitally. Fingerprint matching will help to get to their account created before
The transactions then will be carried out digitally and payments will be done through their digital wallets.

II. METHODOLOGIES IN SYSYTEM

First approach in transport system while travelling was paper printed tickets. Electronic ticketing machines nowadays, take the route of the passenger and print the fare price on the ticket with the route selected.

The conductor had to submit all the data like instant fare calculations, total day collection report, Station reports for accounting purpose. [1]

III. ETM SYSTEMS

ETMs are used for in-vehicle purpose. ETMs uses fare tables to store all the data regarding fare. ETMs manage functions to assist both driver and conductor. ETMs make the whole system friendly as it stores the data, calculates and gives the actual fare. ETM machine is shown in fig.1. [1]

Fig.1: Electronic Ticketing Machine

IV. PROPOSED SYSTEM

A. *Use of Library Files*

1. *Keypad Library*

Keypad is a library that is used for matrix style keypads with the Arduino. Version 3.0 now supports multiple key presses. To promote Hardware Abstraction this library was created.

By hiding the Digital Read calls and pinMode it improves the readability of the code. The library is backward compatible that means it allows user to have the original single key press functionalities.

Keypad (makeKeymap(userKeymap), row[], col[], hor , ver)
const byte hor = 4;
const byte ver = 3;

```
char map[hor][ver] = {{'1','2','3','A'},
                {'4','5','6','B'},
                {'7','8','9','C'},
                {'#','0','*','D'}};
byte horPins[hor] = {4, 3, 2, 1};
byte verPins[ver] = {8, 7, 6, 5};
Keypad keypad = Keypad( makeKeymap(map), horPins,
                verPins, hor, ver );
```

2. chargetKey()

This function gets called when any key is pressed. It is non-blocking function.

3. Liquid Crystal Library

Arduino Boards are allowed to carry control of the LCD's based on the HITACHI HD44780 chipset, which is found on most text based LCD's. Library operates on either 4 or 8 bit mode.

Arduino supports different kinds of LCD's. In our system we have used 16*2 LCD.

We can set cursor anywhere on LCD with the help of Liquid Crystal Library, with a function setCursor(x,y).

For clearing the screen by using object.clear()

4. Thermal Printer

Thermal printers are known as receipt printers, to print the final output. This printer is used for printing tickets in our system.

5. ESP8266Wifi Module

The ESP8266 Module is much impressive also low cost module suitable for adding Wifi functionality to the arduino microcontroller

This module uses serial communication to communicate with the arduino device.

The Rx pin of the ESP8266 Module is connected to the Tx pin of Arduino and Tx pin of ESP8266 is connected to the Rx pin of arduino board.

We are using this module for providing communication between arduino and server(php+mysql database).

This ESP8266 module requires 3.2volts for powering up. If we suppy voltage above 3.2volts then there will be chances of failure in module.
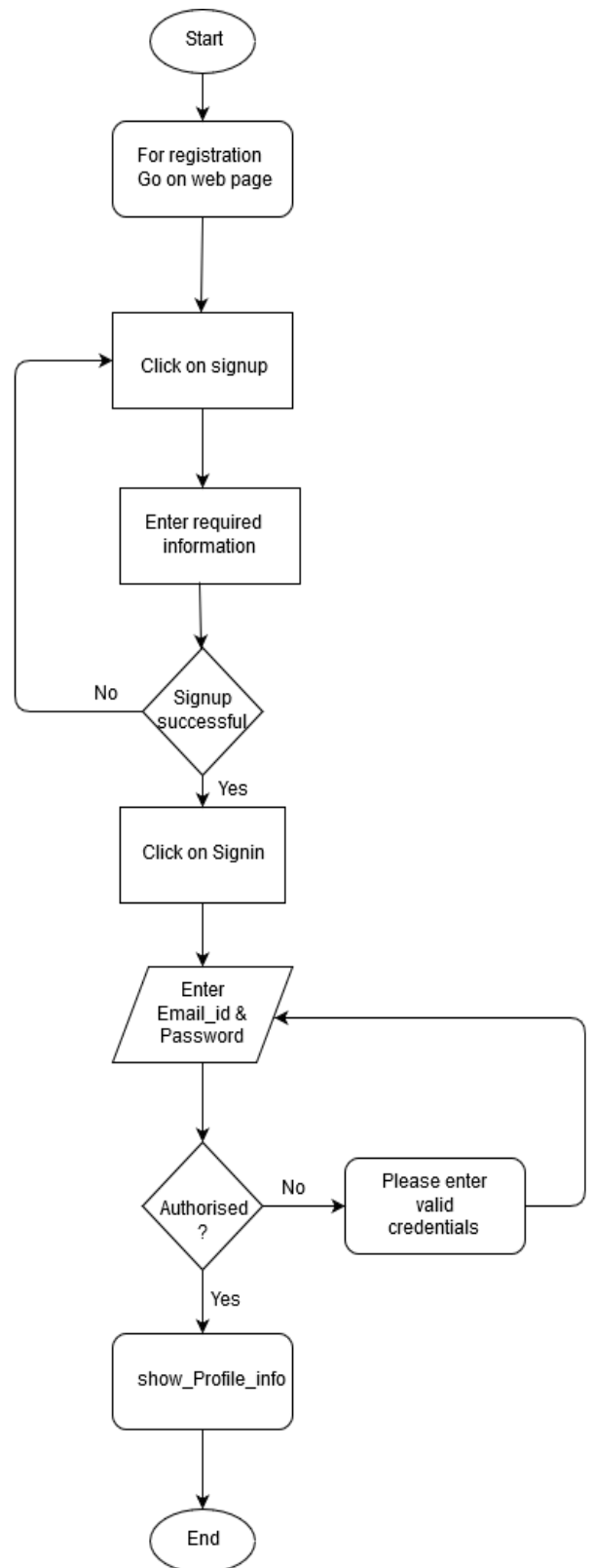
V. ALGORITHM

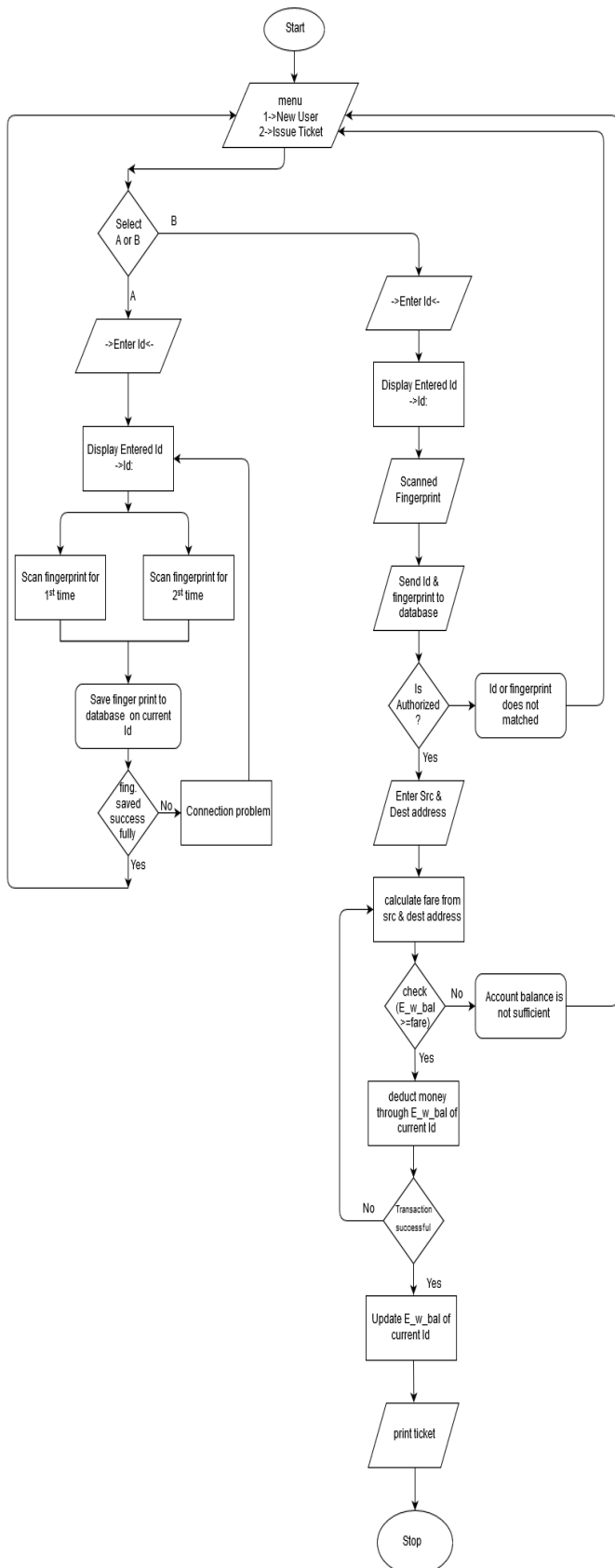Fig.2: New Registration Sign Up Algorithm.

Fig.3: Algorithm for processing Ticket through the digital transaction.

VI. CONCLUSION

ETMs will be given more security by providing fingerprint module. This proposed system will overcome the problem of making payments for tickets. The system goes with the concept of Smart city, where the transactions are made digitally faster.

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