

## A Review : Biometric Fingerprint Recognition For Bus Ticket System.

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**Abstract**—Prior work has shown that when traveling in a bus the payment done for ticket is by cash .The bus ticket has such a payment figure which makes the traveler or the conductor short of money in terms of change. This makes the conductor to keep the change with himself .This creates inconvenience to the travelers. Hence there is a need for better work environment. To overcome this problem we are making use of fingerprints of the traveler which are linked to the database. The registration process will take all the details of the user when traveling for the first time. The account is created with some e-money in it .While traveling user has to give his fingerprint and pay the money for ticket through his account automatically .This overcomes the user inconvenience.

**Keywords**-Arduino UNO,Global System for Mobile Communication(GSM), Fingerprint Module, Mini Thermal Printer,MySQL Database, Security.

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### I. INTRODUCTION

Today's transportation system is a hectic for people living in fast running world. Transportation system needs to be smart enough to provide smart service to every individual. The current scenario in bus transport is very irritating, as there is shortage of money either with the conductor or the traveler.

The project goes with smart city concept. We are presenting a smart device which will permit the travelers to travel anywhere in a bus by using e-money. It is an issue that is arising nowadays to give a change to buy a ticket, this project will overcome that issue and make the traveler travel with his e-money.

We are using Arduino UNO/Orange Pie as a base for this system along with GSM Shield Module, Fingerprint Module, Thermal Printer, Small LCD Display, Keypad, etc.

User's data will be stored on database by making them register on a website created by us. MySQL Database is used here. This database will be operated by using PHP and HTML languages. Database contains all registered user's data.

We are creating a user wallet at the time of registration for the purpose of transactions. The purpose of wallet is to deduct the ticket fare during traveling.

### II. LITERATURE SURVEY

1. The paper is work for ATM Security System based on Fingerprint Recognition & OTP. The Fingerprint is scanned & matched with the centralized database which is located at a remote location and also for comparison the data is temporarily store in RAM.[1]
2. The paper works with the ATM Teller Machine with higher security levels as: Fingerprint, Face Recognition & OTP. First the person will scan the Fingerprint, if a Fingerprint match it goes for face recognition, If face does not match with data in database then system sends OTP to registered users mobile number via SMS. Then appropriate action should be taken by the owner of the account. If all authentication fails then alarm will be triggered.[2]
3. The paper works on home automation system. Here they have used various components like the GSM Module,

Micro Controller, Mobile Device. The user is supposed to send commands to the Micro Controller using GSM Module .This communication is wireless communication. All the home automation is done by this method giving special set of commands.[3]

### III. SYSTEM OVERVIEW

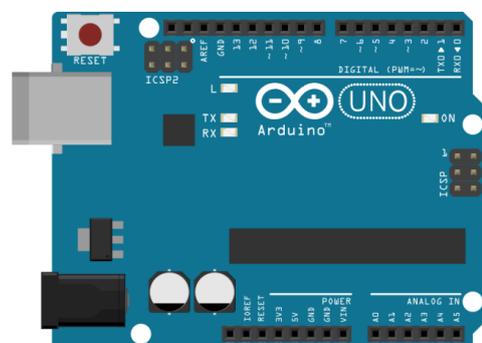
#### A. HARDWARE

##### Arduino :

Arduino is an open source platform. Arduino boards can read input from sensors and give output on respective device. The board is controlled by giving set of instructions through the microcontroller. For development on arduino we require Arduino Programming Language, Arduino IDE.

Technical Specifications:

- Microcontroller – Atmega328P
- Operating Voltage – 5V
- Digital I/O Pins – 14
- Analog I/O Pins – 6
- Clock Speed – 16MHz
- Flash Memory – 32KB



Fig(1) : Arduino Uno

**Arduino Ethernet Shield:**

The figure (fig.2) shown below is an Arduino Ethernet Shield .It connects Arduino board to internet. It is based on Wiznet W5100 Ethernet chip for communication. This provides internet stack capable of both TCP and UDP. The Ethernet shield has micro SD connector. The Arduino board pins 10,11,12,13 are used to communicate with Ethernet shield, so they cannot be used for general I/O.



Fig (2): Ethernet Shield

**Fingerprint Scanner:**

It performs functions like fingerprint scanning, image processing, fingerprint matching, searching and template storage. For image rendering, calculation, searching high powered DSP chip is used. This module is connected to any microcontroller with TTL serial and send packets, detect thumb prints, and search. During scanning process LED's are lit up.



Fig (3): Fingerprint Scanner

**Thermal Printer:**

The figure (fig.4) shown below is a thermal printer which will be used to print the final ticket in our bus ticket system. The thermal printers are also known as receipt printers. The printer interfaces with microcontroller, you need 3.3V-5V TTL serial output from microcontroller to print text, barcodes, bitmap graphics, and a QR code. It can fit upto 50ft of paper at

once. Printing Speed is 50-80mm/s. Needs 5V-9VDC power supply.



Fig (4): Thermal Printer

**B. SOFTWARE**

**Arduino IDE**

IDE makes it easy to write code on Arduino and it is simple to upload the code on board using USB cable. It runs on different platforms like Windows, Mac OS, and Linux. It has a JAVA based environment.

**XAMP Server**

It installs easily Apache Distribution containing PHP, Perl, MariaDB/MySQL. XAMP can be used on Windows as well as on Linux.

**IV. SYSTEM ARCHITECTURE**

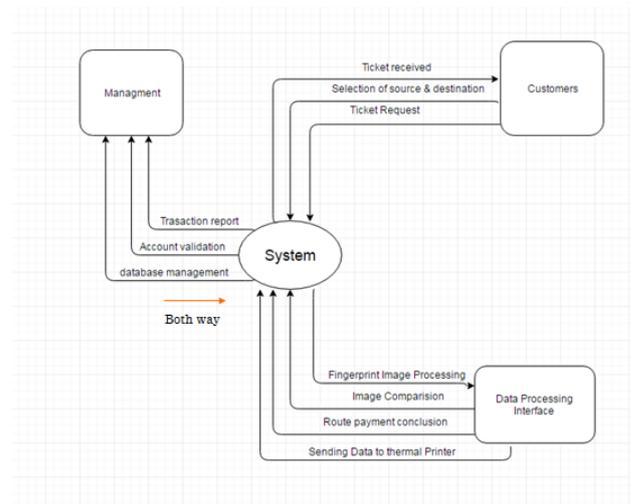


Fig (5): System Architecture

The above figure (fig.5) shows the flow of the bus ticket system.

**Registration:**

Traveler has to register himself before taking his first ride in a bus. For registration we will create a website using knowledge of PHP, HTML and MySQL (Database). When the

user registers s/he will be given a Unique ID. With his registration a virtual Wallet is also created. By using Bank Gateway we can easily transfer money to wallet. This money will be used during travelling

After registration when the traveler will travel s/he has to give his/her thumb impression so that his fingerprint can be used for further transactions.

#### **While Travelling:**

Travelers Unique ID and fingerprint will be used to match with the database, once the fingerprint is matched whatever the payment of his ticket is to be made will be directly deducted from his wallet, if the wallet has a sufficient balance.

After the transaction is successfully done, ticket will be printed through thermal printer and also user gets SMS containing current fare deducted and available balance.

#### **Parental Control:**

At the time of registration parents need to add their children details so when the child travels whatever the ticket fare generated will be deducted from the parent's wallet. This will also notify the parent from where their child is travelling and at what time.

#### V. CONCLUSION

People face problem while they travel in bus, as they don't have change(money).there is lot of corruption seen there. To overcome this problem we are making this system.

Today we know that everything is turning towards being smart, our system too. We are including smart travelling. We want to have e-money so that is less corruption This will support smart city concept.

#### VI. FUTURE SCOPE

This system can be used later on at places like shopping malls: customer has to pay change of 2-3 rupees at the time of payments; it is not possible that each time customer can pay this change so the system if gets implemented this issue can be eradicated. Similarly this can be applied at hospitals, grocery shops, restaurants, petrol pumps, etc.

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