

HIGHLY SECURED RAILWAY RESERVATION USING BIOMETRIC TECHNOLOGY

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ABSTRACT

Indian Railway is one of the world's largest railway networks comprising 115,000 km of track over a route of 65,436 km and 7,172 stations. Security is the main factor in all organizations and has more importance in Indian Railway. Security can be provided by any mean cannot provide more flexibility, the existing rail system does not contain sufficient security, so we think to implement biometrics in our research and then we moved to another innovative technology to use finger print module also for the add-on for user flexibility using Global System for Mobile Communication module for Communication purpose of sending and receiving message. By this Research, we can minimize Fraud in Reservation and give more facility to traveller and improves security for the society. This also simplifies the Reservation System in that we will take fingerprint of the person who goes for reservation/ticket booking and help a lot humanitarian by this innovative technology. Using GSM Technology the message will be send to the user with information before his journey. Standalone module which contains Finger Print Module verifies the person's identity. At the time of journey Ticket checker will verify fingerprint with previously stored data using standalone module as a part of verification. By this more number of papers will be saved by that can help Railway in increasing their income by saving cost of paper. No need to carry Identity Proof.

Keywords: ARM7 Microcontroller (LPC2148), Finger Print Module, GSM module, Serial Communication.

1. INTRODUCTION

Imprints formed on Finger contain friction ridges of the skin. Generally they are used for security based application because of their immutability and individuality. Immutability refers to the permanent and unchanging character of the pattern on each finger and Individuality refers to the uniqueness of ridge details across individuals; Two fingerprints are alike is about the probability of 1 in 1.9x10¹⁵. On the other hand, physical fingerprint verification results in monotonous behaviour, expensive and time consuming; it is incapable to meet today's escalating requirements.

Fingerprints are taken from fingerprint sensor and compared with the fingerprint images stored in the database. Image is compared by Module itself. For smart and efficient data transactions, various database management software are available. In this project we are using MS EXCEL for database management. The entire process of operation is executed by ARRS tool, which is developed by us. Fingerprint of the traveller is being stored when he goes for reservation. Before 12 hours of the journey message will be send to user when user travels through train fingerprint is being scanned using standalone module by ticket checker.

When traveller leaves train Station master checks the Fingerprint on module for Verification at Platform. Commonly existing Railway reservation systems have implemented general technique go stand in queue and book ticket and some person making reservation on wrong name to do reservation fraud .while travelling they have to carry identity card. In this project we have implemented Fingerprint matching technique involving fingerprints, which we all human beings carry on with them by default. So, loss of identity card or passwords is not a concern here. Also no one can travel through someone else's ticket. Traveller will get all details so they don't need to go early station and search for seat and coach no etc. So it helps to humanity by easy procedure. Also we save paper by not using the paper ticket so it help a lot to environment.

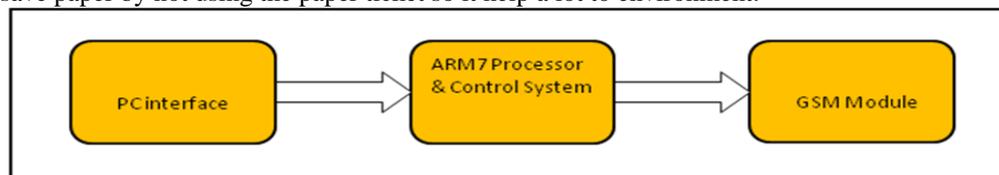


Fig 1: Finger Print Module at Station

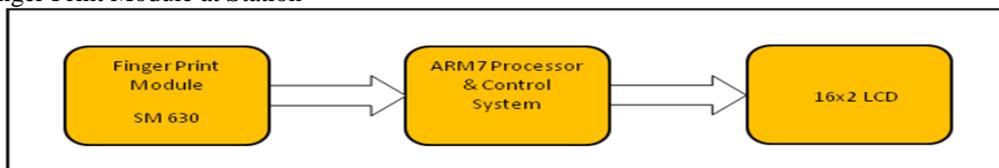


Fig 2: Standalone Module at Ticket Checker Side



2. REVIEW OF PROJECT

This research project consists mainly three phases, they are

1. Registration phase
2. Ticket Booking phase
3. Verification (at TC (Ticket Checker)) phase

1. Registration Phase:

Here the passenger who comes for ticket booking need to enroll with details contains mainly finger prints which are taken from a standalone finger print module, user name, password, passenger name, address and mobile number. A username and password will be given to book ticket offline.

2. Ticket Booking Phase:

The ticket booking can be done in two ways, at booking station and On Own booking. The details of journey are taken from the passenger to book ticket. The ticket confirmation will be send to mobile as a SMS using GSM module. Booking at own interest needs to give username and password to validate correct credentials and can be proceeded to book ticket.

3. Verification (at TC) Phase:

This phase is used to verify passenger booked ticket at TC by using finger print standalone module. A confirmation is displayed in LCD screen about validation.

The communication with the hardware (ARM7 Processor, finger print module and GSM Module) is possible through serial communication and it is the main interface between the computer and ARM7 processor in hardware kit.

3. PROPOSED SYSTEM

3.1 ARM7 Processor and Communication with Computer:

This system mainly contains a finger print module (R303A) which provides high security and is capable to process finger print detection with high accuracy.



Fig3: ARM7 Processor Integrated with accessories

3.2 R303A Finger Print Module:

The ARM7 board is responsible to receive data from computer, Finger Print Sensor, and other Terminals and to send SMS to passengers when ticket is booked.



Fig4: R303A Finger Print Sensor

3.3 ARRS (Advanced Railway Reservation System) Tool:

This tool is used to register a new register, ticket booking, to maintain the database and send SMS to passengers automatically after ticket booking. Login Screen gives two provisions; they are Registration for first time and Login for already registered customers.

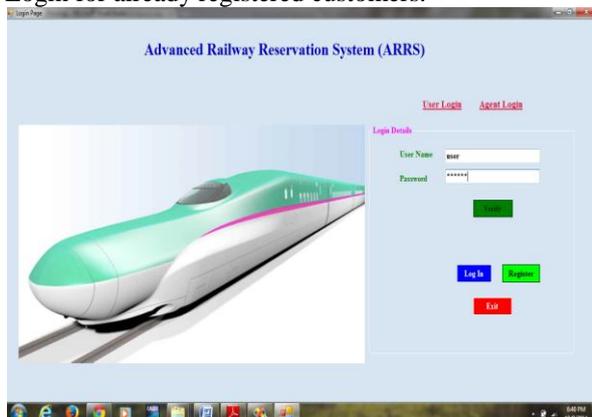


Fig5: ARRS tool Login Screen

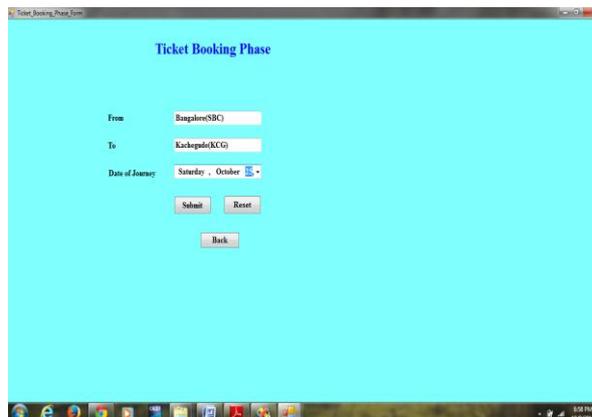


Fig6: Ticket Booking Screen



Fig7: Ticket Payment Screen

CONCLUSION

By this Research Work We can Help to Society by Simplify the System We can save lots of Money. Also by not using the Paper we will save lots of Tree and Helps the Environment by Saving Tons of Paper. This ARRS Software enables easy control of whole system of Railway Reservation. This software is user interface between user and devices. This will make railway system better and efficient. Also by fingerprint we can make it as much as simple. Serial Communication between ARM7 and VB.net play important role in this project without this project is not possible. So we can face solve the big Humanitarian Challenge. In the next leg of Research, we plan to do work on the following aspects of our project: With Intervention of the Whole Project with Unique ID Verification Include the Police/ COP Department, so by fingerprint matching we can easily catch if he/she travels in train. We can preserve the fingerprints and further use in public project like ADDHAR, KRUSHI and Crime Investigation Probes etc.

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