# Implementation of Secured and Enhanced Reservation System

## Sabari Muthuraman E[1], Guru Nirmal Raj R[2], Raja Mani R[3]

*[1,2]Lecturer, [3]Head of the Department, Department. of Electronics and Communication Engineering,
Lakshmi Ammal Polytechnic College, Tamil Nadu, India*

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**Abstract -** *In this paper, we aim to reduce railway reservation fraud and provide a lot of facilities to travelers and improve society. Also, change the reservation method that needs the fingerprint of the one that goes for ticket booking. We are used security-based applications based on their individuality and the unchanging character of the pattern on every finger. With the help of the GSM Module, Message will be sent to the passenger's registered mobile with travel data before the journey. So, loss of identity cards or passwords isn't a concern here. Also, nobody will travel through someone's ticket. Passenger can get all details of the journey So that they don't go to the station earlier to search the seat and coach no. It also saves the paper by not using the paper ticket. So it helps a lot to the environment. As a part of verification, TTE can verify the fingerprint of the passenger with stored data employing a standalone module. If the module can't acknowledge the finger, this system will design to send an OTP to the concerned passenger's registered mobile. A unique advantage of this paper automatically allocates the unoccupied passenger seat to the passenger who is the first on the waiting list by avoiding bribe for TTE to get a seat.*

***Key Words***:  Biometrics, Fingerprint, GSM, Railway, Security

## 1. INTRODUCTION

Nowadays the railway ticket reservation systems have implemented a general technique go stand in queue and book ticket. All reserved tickets are manually prepared paper tickets. As the numbers of trains run and the passengers carried accelerated phenomenally over the years, accounting for this kind of big quantity of tickets, posed a powerful undertaking to the Indian Railways. The main drawback of the existing railway reservation systems has some people making reservations on the wrong name to do reservation fraud .While traveling they have to carry fake identity cards. In this paper, we aim to reduce railway reservation fraud and provide a lot of facilities to travelers and improve society. Also, change the reservation method that needs the fingerprint of the one that goes for ticket booking. We have followed Finger Print Technology due to the fact Fingerprints are imprints fashioned via way of means of the friction ridges of the pores and skin and thumbs. They are usually used for security-based applications due to their individuality and unchanging character of the pattern on every finger.  Here we have implemented a Fingerprint matching technique involving fingerprints, which we all human beings carry on with them by default. So, loss of identity cards or passwords isn't a

concern here. Also, nobody will travel through someone's ticket. The traveler will get all details so they don't need to go early station and search for seat and coach no etc. So it helps humanity by easy procedure and also saves the paper by not using the paper ticket so it helps a lot to the environment. The reservation charts of the journey will be prepared before four hours of the train departure this is a major drawback of railway reservation systems. Whether a passenger has boarded the train or not his berth still remains reserved till his destination. After the preparation of the chart, if the passenger cancels his ticket the seat goes to vacant. Also, the transparency in the existing ticketing system is compromised at various levels this results in more space for the touts to book tickets illegally and sells them at an exaggerated price. A unique advantage of this system since the system automatically allocates that unoccupied passenger seat to the passenger who is first on the waiting list.
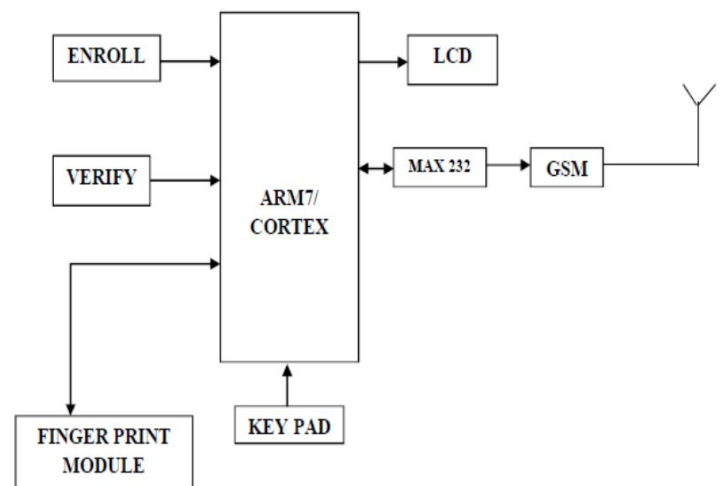
## 2. SYSTEM DESIGN



**Fig -1:** Block Diagram of Proposed System

In the proposed system, ARM Microcontroller is used to monitor the system, then it can able to initialize the GSM modem. The SIM will be registered. After the SIM is registered, the reservation process begins. The person who goes for a reservation that contains the fingerprint Module verifies the person's identity. To select the desired place of travel, after that it is essential to place the finger on the fingerprint module. The module will check whether the fingerprint already exists in the database. If yes, it will show the previously allocated id no of the fingerprint. Otherwise, it

will generate a new id and store it in the database. Once the generation of the id is finished, the LCD screen will display "ID registered successfully". We can remove the finger from the fingerprint module now. This process will take a maximum of 10 seconds. After completing the enrollment of the fingerprint, the ticket will be booked. After that, the passenger gets all the details of the ticket to his cell phone. Our system has another one feature it can continuously monitor the database with the help of ARM and it will update the status of passengers who are turning up for the journey. After this change, the reservation server can return to grasp concerning the seats of absent passengers and will allocate these seats to RAC/WL passengers informing them by sending an SMS. The same details are forwarded to TTE then the TTE allocates that unoccupied passenger seat to the passenger who is first on the waiting list.

## 3. HARDWARE DETAILS

### 3.1 LPC 2103:

The LPC2101/2102/2103 microcontrollers are based on a 16-bit/32-bit ARM7TDMI-S CPU with real-time emulation that combines the microcontroller with 8 kB, 16 kB or 32 kB of embedded high-speed flash memory. A 128-bit wide memory interface and a unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical performance in interrupt service routines and DSP algorithms, this increases performance up to 30 % over Thumb mode. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty.

Due to their tiny size and low power consumption, the LPC2101/2102/2103 are ideal for applications where miniaturization is a key requirement. A blend of serial communications interfaces ranging from multiple UARTs, SPI to SSP and two I2C-buses, combined with on-chip SRAM of 2 kB/4 kB/8 kB, make these devices very well suited for communication gateways and protocol converters. The superior performance also makes these devices suitable for use as math coprocessors. Various 32-bit and 16-bit timers, an improved 10-bit ADC, PWM features through output match on all timers, and 32 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers particularly suitable for industrial control and medical systems.

### 3.2 Fingerprint Scanners:

The beginning of fingerprints goes back to as early as the ancient times. According to historical findings, fingerprints were used on clay tablets for business transactions in ancient Babylon. In China, thumb prints were found on clay seals. But it was in the 19th century that the results of scientific studies were published and fingerprint technology began to be considered more seriously. Using the1800's scientific studies as a foundation, fingerprint technology was already in use by the beginning of the 20th century. In 1924, FBI (Federal Bureau of Investigation) is already known to have maintained more than 250 million civil files of fingerprints for the purpose of criminal investigation and the identification of unknown casualties. In the late 1960's, fingerprint technology met a great turning point when it gave birth to 'live-scan,' a method to obtain a fingertip image without the use of print ink. When the SM630 background highlight optical fingerprint verification module is the latest release of MI axis Biometrics Co., Ltd. It consists of optical fingerprint sensor, high performance DSP processor and Flash. It boasts of functions such as fingerprint Login, fingerprint deletion, fingerprint verification, fingerprint upload, fingerprint download, etc. Compared to products of similar nature, SM630 enjoys the following unique features.

- Self-proprietary Intellectual Property
- High Adaptation to Fingerprints
- Low Cost
- Algorithm with Excellent Performance
- Easy to Use and Expand
- Low Power Consumption
- Perfect Technical Support

### 3.3 Global System for Mobile Communications (GSM):

Early European analog cellular networks consisted of a mix of technologies and protocols that varied from country to country, meaning that phones did not necessarily work on different networks. In addition, manufacturers had to produce different equipment to meet various standards across the markets. In 1982, work began to develop a European standard for digital cellular voice telephony when the European Conference of Postal and Telecommunications Administrations (CEPT) created the Grouped Special Mobile committee and provided a permanent group of technical support personnel, based in Paris. Five years later in 1987,15 representatives from 13 European countries signed a memorandum of understanding in Copenhagen to develop and deploy a common cellular telephone system across Europe, and European Union rules were passed to make GSM a mandatory standard. The decision to develop a continental standard eventually resulted in a unified, open, standard-based network which was larger than that in the United States. In 1989, the Grouped Special Mobile Committee was transferred from CEPT to the European Telecommunications Standards Institute (ETSI) In parallel, France and Germany signed a joint development agreement in 1984 and were joined by Italy and the UK in 1986. In 1986 the European Commission proposed reserving the 900 MHz spectrum band for GSM.

GSM SIM900 Module is a complete Quad-band GSM module which can be embedded in various applications.SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption. It is available with a tiny configuration of 24mm x 24mm x 3 mm; SIM900 can fit almost all the space requirements in your M2M application,

especially for slim and compact demand of design. It use in Speaker and Headphone jacks and also for Short Message Service - so that you can send small amounts of data over the network

## 4. RESULTS



**Fig -2:** Login for Railway Ticket Reservation



**Fig - 3:** Reservation Process needs Finger Print



**Fig - 4:** Fingerprint registered



**Fig - 5:** Reservation Process



**Fig - 6:** Enter to Confirm the Reservation



**Fig - 7:** Ticket Booked

## 5. CONCLUSIONS

There are a lot of security problems in any public transport system that has to be tackled with recent technology which will reduce the burden on the security of the system. So the fingerprint modules which are used in this paper provide a way to reduce the security threats in the system. In this system, we use modern technologies that are also eco-friendly, and that reduces a huge amount of paperwork at the reservation counters. The involvement of third party bookings can be reduced to a huge extent. In dynamic seat allocation, if a passenger left the train TTE can free the seat in our module and it can be utilized for other RAC or passengers on the waiting list. This system has some additional features like an SMS facility wherein the reservation server will send a text message to a RAC or a waiting list passenger in case their ticket gets confirmed. This is a unique advantage of our paper since the system automatically allocates that unoccupied passenger seat to the passenger who is first in the waiting list thereby avoiding bribe for TTE to get a seat.

## 6. FUTURE SCOPE

This system can be introduced in all public transport systems which facilitate long-distance traveling. Fingerprint scanning and biometric scanners can be used in the long run to increase the security of the passengers traveling and reduce activities of anti-social elements. It also reduces the paperwork and ensures that all third party bookings are avoided.

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**BIOGRAPHIES**

**R. Raja Mani**,Head of the Department, Department of Electronics & Communication Engineering, Lakshmi Ammal Polytechnic College, Tamilnadu, India.

**R. Guru Nirmal Raj**, Lecturer, Department of Electronics & Communication Engineering, Lakshmi Ammal Polytechnic College, Tamilnadu, India.

**E. Sabari Muthuraman**, Lecturer, Department of Electronics & Communication Engineering, Lakshmi Ammal Polytechnic College, Tamilnadu, India.