

## SURVEY PAPER ON: - ONLINE TICKET SUBSTANTIATION USING QR CODE BASED ANDROID APPLICATION SYSTEM.

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**Abstract** - Indian Railways is the largest human & goods transport system in the world, is currently having a lot of issues related to Ticket checkers which are the integral part of Indian railways, such as, issues related to Waiting list passengers & without ticket passengers who buy tickets from TC, passengers who don't carry tickets along with IDs, lack of communication between onboard staff & Control room, emergency conditions like robbery, accident, pantry car food issues, medical issues. However there is no proper & efficient system which can deal with these problems. This paper proposes the new system that integrates all the services provided by Indian railways to the passengers. It has two parts. First is Centralised system for management of databases, requests from TCs & all related services. Second part is Android App for TCs by which all works of them can be done digitally like authentication seat allocation checking by using app which scans QR code on the ticket & verifies QR code information with the database. Through this review paper our approach is to make working of TCs more convenient in Indian Railway.

**Key Words:** Centralised system, Android app for TCs, QR code scanning, TC management, Waiting list seat allocation.

### 1. INTRODUCTION:-

Indian Railway is India's third largest human transport system over which 2 crore passengers travel daily all over India. Ticket checkers play an important role in the management of these huge amount of passengers. Even in the 21<sup>st</sup> century where every work is done in the smart way using technology, working of TCs is the same as before. All the tasks are performed manually using the paper sheets. If there are seats available, random people who don't buy tickets enter the compartment and buy tickets from the TC. Due to this, peak seasons take place and work load of TCs increases as well as waiting list passengers accomplish their journey from their source station to destination in standing mode. Indian railway provides lot of services for the convenience of passengers & employees. But, these facilities or services don't get implemented in the efficient way. In short, Indian railways has a lot of resources available. But, there is no efficient system to handle it. The number of passengers in Indian Railway has been increasing drastically in every year, in a rate of 25 to 50 percent from its previous year. Such increase also increases the load of work for TCs. Increasing number of waiting list passengers, increase

rushes in train which results "happy journey" slogan of Indian Railway in to "unhappy journey".

### 2. EXISTING SYSTEM:-

The same type of system is used from the British colonization time when the Indian railways founded in the late 70's. After the evolution of computers, the digital age was started. According to the time, some changes were done in the system. But, these changes were so slight & they were not updated by time. The type of system that is used today, is not updated from last 10 to 20 years. Today 80-85% of working is done using paper sheets.

There are a lot of problems in the current system. The issues related to Waiting list passengers & without ticket passengers who buy tickets from TC, passengers who don't carry tickets along with IDs, lack of communication between onboard staff & Control room, emergency conditions like robbery, accident, pantry car food issues, medical emergencies. All these problems are handled by the Ticket checking staff single handedly. The whole working of TCs is in the form of paper sheets which results in tremendous workload in the peak sessions.

### 3. PROPOSED SYSTEM:-

For making the working of TCs more comfortable, we are proposing the new system in which the manual working of TCs using the sheets of paper will be converted into the digital form. This system integrates all the services provided by Indian railways to the TCs & the passengers.

It has two parts. First is Centralised system which will be situated in the control room at the divisional head office of railways where the tasks like management of databases, allocation of Duties to the TCs will be done. As well as the requests from the onboard TCs will be served efficiently & they will be provided with the all related services.

Second part is Android App for TCs by which all works of them can be done digitally like authentication of seat allocation by scanning QR code on the ticket & verification of QR code information with the database. Also by using this app, TC can communicate with the centralized system for availing the services as well as to launch enquiries & complaints.

#### 4. SCOPE:-

This system will change the face of Indian railways. Where the efficiency & ease in the working & management of TCs will be increased so drastically.

Also, this system is expandable & modifiable. So, We can change or modify it according to the requirements along with time.

#### 5. SYSTEM ARCHITECTURE:-

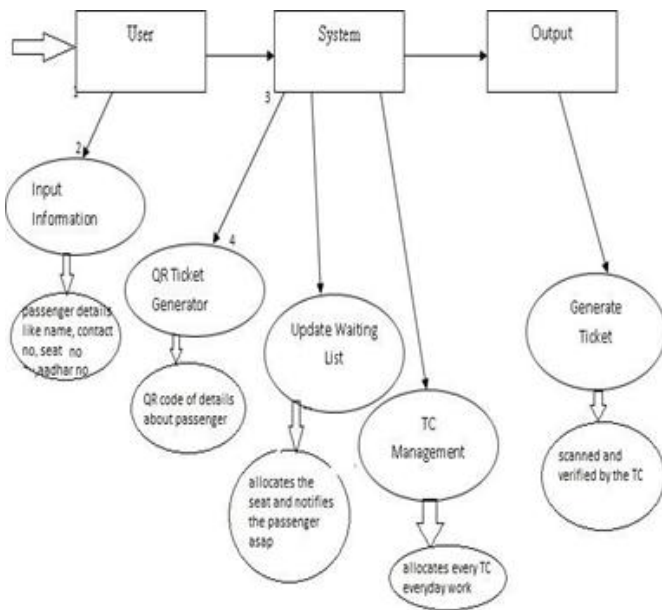


Fig 1: Architecture diagram (a)

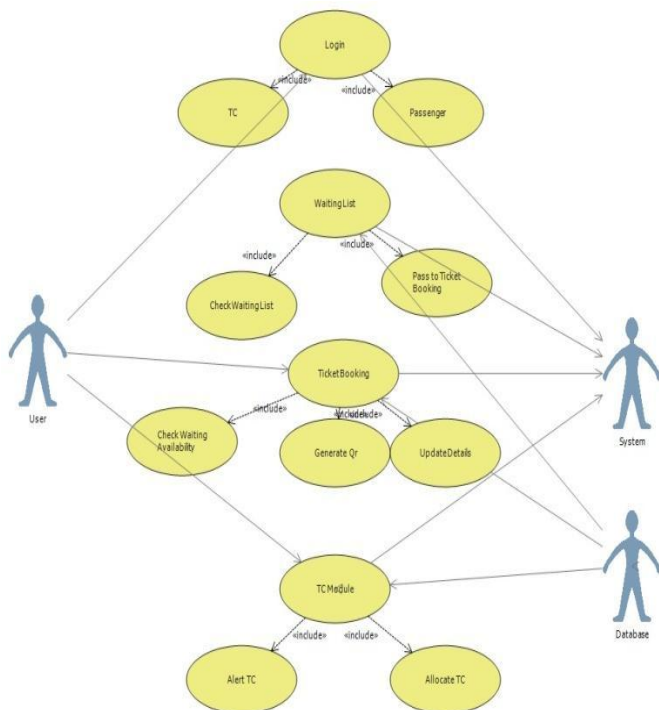


Fig 2: Architecture diagram (b)

#### 6. MATHEMATICAL MODEL:-

Let S be the system

$$S = \{I, F, O, \text{Success}, \text{Failure}\}$$

I=Input to the system

$$I = \{I1, I2, I3\}$$

I1=Passenger Details

I2=TC Details

I3=Waiting Passenger Details

O is the alerts

Let F be the functions

F = set of the functions

$$F = \{F1, F2, F3, F4, F5, F6\}$$

F1=Passenger Information

F2=Check Waiting List

F3=Book Ticket

F4=Encrypt Data

F5=Generate QR Code

F6=TC Management

#### 7. ALGORITHM:-

##### 7.1. Reed Solomon (RS) Algorithm for QR code generation:-

Step 1: enter the confidential information.

Step2: each character is converted into ASCII equivalent, then apply the RSA algorithm for each value with Private key.

Step 3: generate the codeword for the given information by using non-binary RS code, due to this if the QR is damaged or distorted it is retrieved.

Step 4: convert the codeword into binary and place these bits in QR pattern

##### 7.2. Reed Solomon (RS) Algorithm for Decoding the QR code:-

Step 1: read the QR image as the input to the decoding process.

Step 2: eliminate the unwanted bits in QR code (finder patterns) and read the information bits from QR code.

Step 3: convert these bits into decimal and eliminate the parity bytes by using an RS decoding process.

Step 4: apply the RSA algorithm by using Public key to get the original information

## 8. CONCLUSION

There are lot of problems in the current system of Indian railways. All these problems are handled by the Ticket checking staff single handedly. In order to reduce burden of TCs, This model proposes radical change in train operation and passenger experience. Hand Held Devices are given to TCs for smooth and faster verification of passengers. QR code is printed on the tickets and this QR code is scanned by HHT devices. In QR code a passenger specific URL is stored, when HHT device encode this URL by Check-in process it redirects to PRS server and fetch stored data to verify the passenger. Check-in process updates the information of all passengers available in the train and let the DSA server to make the seat reserve or vacant. DSA server allot the seats of absent passengers to waitlisted passengers and if still some seats remain vacant then reflect them as available across railway network from where any passenger willing to board on it can book the ticket. Apart from this Checking, a Check-out and Booking process is also provided to the TTE by this HHT. Check-out process provides the passenger to break his journey at any station by getting his remaining money back and at the same time his vacant seat is provided to a waitlisted passenger. Booking interface provides capability to book the ticket for passengers on board. These technology inclusions in the railway bring transparency and reduce the activities of touts at peak seasons.

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