Online Ticket Substantiation Using 2D Barcode Based Android Application System

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Abstract:-*The Indian Railways is one of the largest human & goods transport system in the world , is currently having a lots of issues related to Ticket checkers which are the important part of Indian railways , such as, issues related to Waiting list passengers & without ticket passengers who buys tickets from tc, passengers who don't carry tickets along with Identification, lack of contact between onboard staff & Control room, emergency situations like robbery, accident, pantry car food issues, medical issues. However there isn't a proper & efficient system which can deal with these problems. This paper proposes the new better system that integrates all the services provided by Indian railways to the passengers. Consisting of two parts. First is Centralised system for management of databases, requests from TCs & all related services. Second One is Android App for TCs by which all the work like authentication, seat allocation checking using app which scans 2D QR code on the ticket & verifies 2D QR code information with the database. Through this paper our approach is to make working of TC's more convenient in Indian Railway.*

Keywords-*Centralised system, Android app for TCs, QR code scanning, TC management, Waiting list seat allocation.*.

I. INTRODUCTION

The Indian Railway is India's third largest human transport system over which 20 million passengers travel daily all over India. TCs play an important role in the management of these huge amounts of passengers. Even in the 21st 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 seat available, random people who don't buy tickets enter the compartment and buy tickets from the TC. Due to this, during peak seasons which do 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 position. 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 have 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".

II. EXISTING SYSTEM

The same type of system is used from the british colonization time when the Indian railways founded to the late 1870's. After the evolution of computers, the digital age was started. According to that time, few changes were done in the system. But, they were not as updated by time. The type of system that is used today is not updated from past couple of years. Today most of working is done using paper sheets.

There are lot of problems in the current system. The issues related to Waiting list passengers and without ticket passengers who buys 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 hard copies which results in tremendous work load in the peak as well as everyday sessions.

III.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 one is Android App for Ticket Checkers by which all works of them can be done digitally like authentication of seat allocation by scanning 2D 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.

IV. LITERATURE SURVEY

Author	Title	Journal name
Pratik S.Dhumala[1], Dhananajay Dhandeb[2]	*Android Ticketing of Railways with GPS Validation Using QR Code with Alarm feature*	International Journal of Innovative and Emerging Research in Engineering
SanaKhoja[1], Maithilee Kadam[2].	*Android sub-urban railway Ticketing*	International Journal of Technical Research and Applications
Pranjali kharwade[1], Isha gujarkar[2], Vidhi Sharma[3], Shweta Holey[4]	*Smartphone Application for Ticket Reservation and Validation Using Mobile Network*	International Journal of Emerging Technology and Advanced Engineering

V. SYSTEM ARCHITECTURE

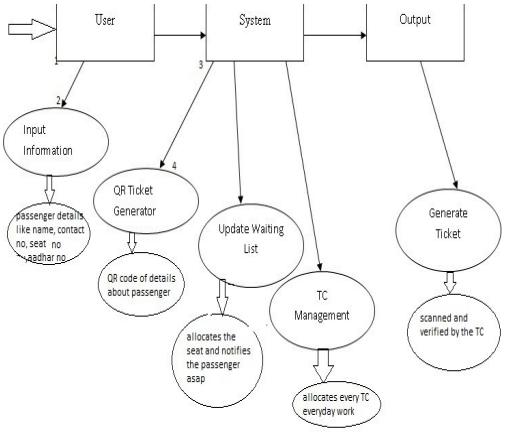

Fig. 1: Architecture Diagram(a)

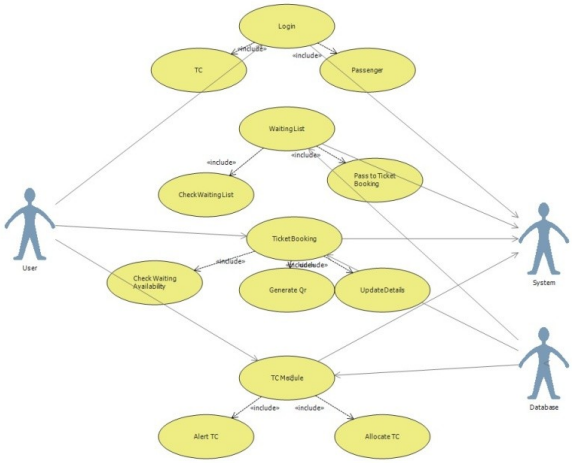

Fig. 2: Architecture Diagram(b)

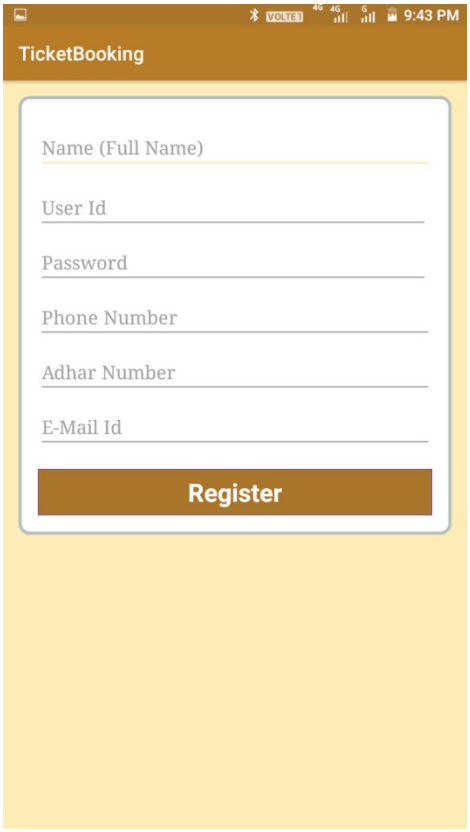

Fig. 2 QR code generation module

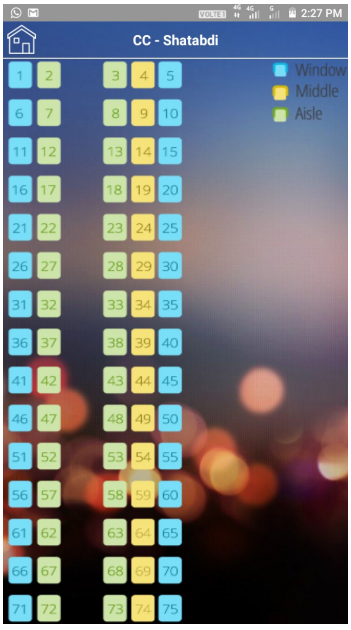

Fig 4: Seat Map

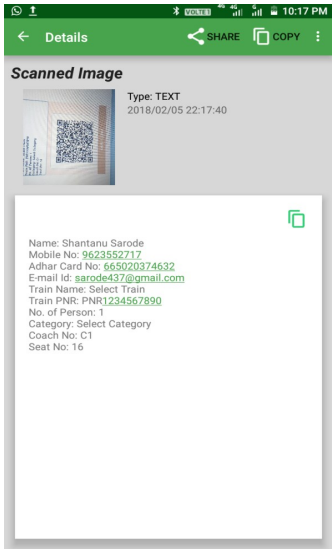

Fig 5: QR code scanning

VI. Mathematical Model

.Lets S be the System.

S = {I, F,O, Success, Failure}

where I = Input to the system

I= {I1, I2,I3}

I1: Passenger Details

I2: TC Details

I3: Waiting Passengers Details

O is Alerts

Let s F be the Functions.

F = Set of 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

VII. Algorithms

A. *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

Step3: 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

A. 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

VIII. Technology to be used

A) JAVA-:

Java has been tested, refined, extended, and proven by a dedicated community of Java developers, architects and enthusiasts. Java is designed to enable development of portable, high-performance applications for the widest range of computing platforms possible. By making applications available across heterogeneous environments, businesses can provide more services and boost end-user productivity, communication, and collaboration— and dramatically reduce the cost of ownership of both enterprise and consumer applications.

The original and reference implementation Java compilers, virtual machines, and class libraries were originally released by Sun under proprietary licenses. As of May 2007, in compliance with the Specifications of the Java Community Process, Sun re-licensed most of its Java technologies under the GNU General Public License. Others have also developed alternative implementations of these Sun technologies, such as the GNU Compiler for Java (byte code compiler), GNU Class path (standard libraries), and Iced Tea-Web (browser plug in for applets).

B) MySQL:

MySQL is the most popular Open Source Relational SQL Database Management System. MySQL is one of the best RDBMS being used for developing various web-based software applications. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company. *MySQL* is the most popular Open Source Relational SQL Database Management System.

MYSQL Enterprise edition includes the most comprehensive set of advanced features & management tools for MYSQL.

MYSQL is the world's most popular open source database. Whether you are a fast-growing web property, technology ISV or large enterprise, MYSQL can cost-effectively help you deliver high performance, scalable database applications

MYSQL is popular choice of database for used in web application & is a central component of widely used LAMP open source web application software stack.

MYSQL Query Analyzer: To optimize performance by visualizing query activity and fixing problem SQL code.

IX. *REQUIREMENTS*:

A) Software Requirements for Desktop:
- OperatingSystem:Windows7or above
- Software Version : JDK 1.7 or above
- Tools : Visual Studio 10
- Front End : .net
- Back end : MySQL

B) Hardware requirements for Desktop:
- Processor : Intel Core i3 and above
- RAM: 1 GB and above
- Min Memory: 1GB on hard disk

C) Software requirements for Mobile Application:
- Operating System : Android 4.1
- Tools:- Android Studio 2.3
- Front end:- Android
- Back end:- My SQL

D) Hardware requirements for Mobile Application:
- Processor : Mediatek or snapdragon
- RAM: 1 GB and above
- Min Internal Memory: 100 MB

X. CONCLUSIONS

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 Checkin, 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..

XI. ACKNOWLEDGMENT

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