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Automated Train Ticket Validation and Verification System

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Abstract— From years, Indian Railways has been the most prominent, convenient and affordable means of transport. In this paper, our motive is to digitize the ticket checking and validation system along with allocation of vacant berths in an ongoing journey, which will eliminate the major work of TTE (Train Ticket Examiner). Our proposed system helps to allocate seats to the passengers with RAC and waiting tickets automatically. The purpose of this paper is growth of digitization with QR code and the proposed application. This digitization will eradicate corruption as the system will maintain all the records in database. Also, study explored the reservation status will assure safety of passenger.

Keywords—Big Data, Android, Java and Cloud.

I. INTRODUCTION

As we know that this decade is an age of technologies and is expanding in all fields, this is an efficient view of collaborating it with railway system. Talking about Indian Railway Ticket System, all that comes to our mind is the bundle of sheets and loads of paperwork. Although, Indian Railways are the most acceptable means of transport for ordinary people. But some measures should be taken to lessen the manual efforts. Taking in account, the elevation of technology in every field, we need to enhance the existing train ticket validation verification system.

In the existing system the TTE (Train Ticket Examiner), Has to manually validate and verify the tickets of every passenger from berth to berth. The daily grind for TTE is tiresome as he has to maintain record of every passenger which include bunch of paper work.

As mentioned above about the enhancement of existing system includes minimization of paperwork for TTE and making it environment friendly. This blotch can be achieved by making an application for the TTE which maintains all the information about the passengers in the cloud database which is absent in existing system.

This ensures safety for the passengers as their source and destination is recorded in the database. QR code (A QR code is a type of matrix bar code first designed for automotive industries) serves as a train ticket to the passengers which when scanned, verifies the presence of the person boarding the train in TTE's application.

This application subtracts corruption as all the data is stored in Cloud and the system automatically allocates the berths to the Passengers having RAC and W/L tickets.

II. MOTIVATION

The main motivation is to abate the huge paper work in Railway's ticketing system and management for TTE (Train Ticket Examiner), who has to visit berths for validation and verification of the tickets which is a hectic job to do. So, this is a real-life problem arising as an inconvenience for Indian Railway's Ticket Checkers which motivated us to build a solution. Another motive is to control the corruption in Railway system. Our proposed system helps to eliminate the corruption by annihilating the involvement of TTE in allocating the vacant berths to W/L passengers.

III. OBJECTIVE

- To efficiently digitize the ticket validation and verification system reducing manual work.
- To reduce paperwork.
- To reduce corruption.

- To save time

IV. LITERATURE SURVEY

SR No.	TITLE	AUTHOR	YEAR	DESCRIPTION
I.	An intelligent ticket checker application for train using QR code	Smita Patil, Shruti desurkar, Deepali Sanaskar,	2016	We have precisely got our two of views fulfilled in this paper: 1 QR code working. 2 Ticket system for trains.
II.	Android application generating QR code as Railway Ticket.	Karhikram, Sarvanan, Madhavan.	2014	With the help of this paper we came up with the idea to print QR code on tickets.
III.	Dynamic and transparent seat allocation using QR code in Mobile application	Joydeep Singh, Vaibhav Shukla.	2015	From this paper we came up with the idea to make an android app for ticket checker.
IV.	Android application for ticket reservation with GPS as ticket validation.	Tushar Dongare, Akshay Babar.	2014	They provided various techniques for buying tickets through their Smartphone application through GPS facility of android mobile so that passenger can easily get the list of station and he can easily buy tickets.
V.	Android application for local railway ticketing using GPS validation	Snehal Kalbhor, Ashwini Mangulkar, Mrs. Snehal Kulkarni	2014	They proposed the various techniques for buying metro tickets or local railway tickets through their Smartphone application and introduced ticket checker.

V. Existing System

India has some of the profound train fares in the world, and passenger traffic is heavily sponsored by more expensive higher-class fares. In our existing railway ticketing system, the passenger has to manually get a ticket which is then verified by the TTE once the passenger is in ongoing journey. Except some disconnected places, train ticketing system is computerized to a large extent. Computerized tickets are convenient as it can be booked from any of your comfortable location. Tickets can also be booked from your cell phones or via internet with certain T&C applied.

For long-distance travel, reservation of a berth can be done for comfortable travel up to 120 days before the date of intended travel. [80] All the necessary information about the passenger, his name, age, UID, concession (if any) is recorded on the ticket. Different trains have variable fares. The train fares depend on the classification of trains (super-fast, passenger) the passenger is traveling in.

If a seat is not vacant, then the ticket is put in a waiting list order; else the ticket is confirmed, and a berth number is printed on the ticket. A person receiving a wait listed ticket must wait until there are enough cancellations to enable him to move up the list and obtain a confirmed ticket. [80] [81]. If his ticket is not confirmed on the day of departure, he may not board the train. Some of the tickets are assigned to the RAC or Reservation against Cancellation, which is in between the waiting list and the confirmed list. [80] [81] The passenger can board a train and obtain the seat which is allotted to him by the ticket collector. Before allotting the seat to a RAC passenger he assures there is a vacant seat available.

Reserved Railway Tickets can be booked through the website of Indian Railway Catering and Tourism Corporation Ltd. [82] and also through mobile Phones and SMS. Tickets are of different categories, I-Tickets and eTickets. I-Tickets are manually booked by the passenger from the ticket counter which he can carry with him in on going journey. eTickets are printed by the passenger and carried while travelling. While travelling on an eTicket, one must carry one of the authorized valid Photo Identity Cards. Cancellation of eTickets are also for a limited time period. For frequent commuters, a season pass (monthly or quarterly) guarantees unlimited travel between two stops.

VI. Implementation Status

The proposed system Assists Ticket Checker to validate and verify the passengers boarded and passengers who have not attained train. In this system, there would be an Android Application given to the User (Ticket Checker). And a QR code would be printed on Ticket of the boarding passenger.

Thus, as passenger boards the train the QR code would get scanned and the details would be passed to Database. Once the details are updated it would be reflected on Android App. In this paper, we also have taken concern about the waiting list Passengers. Even the passengers are in waiting list would be having QR code printed on their ticket. In this system, a passenger's unique identity would be recognized with help of UID and Photo ID at the time of purchasing of ticket.

VII. Algorithim for Relevant Feature Discovery

Step 1: Accept Passenger's details
Step 2: Get UID/Photo from passenger.
Step 3: call QR generation function
- Step 2.1: Passenger's Source to Destination.
- Step 2.2: Passenger's Type Waiting/General/ RAC.
- Step2.3: Passenger 's Allocated Seat No.
- Step 2.4: Passenger's Phone No
- Step 2.5: Output as QR code.

Step 4: call of scanning Function
- Step 4.1: Get Seat no as Input (If General /RAC Type else go to Step 6).
- Step 4.2: Call Insert Function
- Step 4.3: Process (UID, Phone No, Source, Destination0).

Step5: Display Result on TC's App.
Step 6: Start the process for assigning vacant seat to the passengers
- Step 6.1: Check for Source and Destination.
- Step 6.1: Check for available Seat.
- Step 6.2: Allocate Seat to the Passenger.
- Step 6.3: Notify Passenger with the help of text message.
- Step 6.4: Update on TC's App.

Step 7: Stop.

VIII. Mathematical Model

System Specification:

S= {S, s, X, Y, T, fmain, DD, NDD, ffriend, memory shared, CPU count}

S (system): - Is our proposed system which includes following tuple.

s (initial state at time T): User's Details are entered in system while buying ticket t Ticket Counter and QR Code generated & printed on Ticket

X (input to system): - Input Query. The user must scan his QR Code of the ticket this will inform the system that the user has boarded the train.

Y (output of system): - User has boarded the train is reflected on TC's app.

T (No. of steps to be performed): - TC Validates the passenger's boarding with the help of Unique ID.
fmain (main algorithm): - The main algorithm is in allocating a valid seat to him throughout his journey.

DD (deterministic data): - It contains Database data. Here we have details of every passenger who has boarded train.

NDD (non-deterministic data): - We can't predict that weather all the passengers of waiting list would board, none of them would board or some of them would board. Hence this is Non-Deterministic Data for us.

ffriend: - QR Code and UID details. In our system, QR code and UID details are the friend functions of the main functions. Since we will be using both the functions, both are included in ffriend function.

Memory shared: - Database. Database will store information like list of scanned QR codes, registration details of passenger, UID/Photo of passenger and numbers of waiting list passengers. Since it is the only memory shared in our system, we have included it in the memory shared.

CPU count: - 2. In our system, we require 1 CPU for server and minimum 1 CPU of android device for TC's app. Hence, CPU count is 2.

IX. Experimental Setup and Result

Result Evaluation

The Successful execution of this proposed system would have numerous advantages. Execution of this system gave us track of actual no of passengers usually board and to make and calculate cost requirement of each journey. This made the decrease in Corruption rate that used to take place often in case of allocating vacant seats to waiting list passengers. This has also reduced manual work and efforts of TC in the process of ticket checking and validating. Thus, this project turned to be successful in execution and implementation.

X. Conclusion

Item	Existing System	Proposed System
Algorithms	NA	Apriori Algorithm
Accuracy	Low	High
Complexity	Low	Low
Explanation	TC use to carry a paper with list of passengers that are going to board train. He used to make changes on the paper and keep the track of verified passengers. And in some cases, TC used to take Bribe to assign vacant seat to the passenger.	Android Application given to the User (Ticket Checker). And a QR code would be printed on Ticket of the boarding passenger. Thus, as passenger boards the train the QR code would get scanned and the details would be passed to Database. Once the details are updated it would be reflected on Android App. In this paper, we also have taken concern about the waiting list Passengers. Even the passengers are in waiting list would be having QR code printed on their ticket.

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