Android Ticketing of Railways using QR Code & Validation using GeoLocation APIs

Parth Thakker¹ Sagar Sable² Suchandra Tungare³ Krishnanjali Shinde⁴
1,2,3 BE Student 4 Assistant Professor
1,2,3,4 Department of Computer Engineering
1,2,3,4 Atharva College of Engineering, Mumbai University Mumbai, MH, India

Abstract— the “Android Ticketing of Railways (ATR)” can be bought easily anytime, anywhere and ticket will be present in the customer’s phone in the form of “Quick Response Code”. Also the ticket checker is provided with an application to search for the user’s ticket with the ticket number in the cloud database for checking purposes. With this feature checker easily validate tickets. GPS facility is used for validation of the ticket at the source and deletion at the destination. The information for each user is stored in a CLOUD database of railway server for security purpose which is currently unavailable in the railway system. We will also include Alarm (Notification using FCM) system in application, where after reaching destination Android alarm system will be used by an application to alert the passenger.

Key words: QR Code, ZXINGlib, GeoLocation, Google Vision, Volley, JSON, FCM (FireBase)

I. INTRODUCTION

The technology has expanded to a huge extent in the past few decades and also is being utilized in the field of transportation services. Also hon'ble Prime Minister of India Shri Narendra Modi, started a new project called as “DIGITAL INDIA”, Is an initiative of the Government of India to ensure that government services are made available to citizens electronically by improving online infrastructure and by increasing internet connectivity.

So we have created an android mobile application to not only buy railway tickets which you can carry in the form of Quick Response Code, which will be saved in the smart phone which it is booked from and also our MySQL Database Server and will expire on its own once the destination is reached. For example, if you need to book a ticket from your location to another location, then this app comes in handy where you can have access to ticket booking process with just a touch away on your smart phone. This app uses smart phones to validate the railway tickets booked and it deletes your ticket automatically once the user has reached the destination using Geo-Location based API after a certain interval of time. In advancement to this, the ticket checker can validate the ticket with a checker application provided to check if the ticket is valid by scanning the QR code and checking in the cloud database if the ticket is valid. The application consists of details regarding the schedule of trains, the routes taken by the trains with their source and destination places and the cost/expenditure that will be required to reach the destination. The payment can be done directly through the application via different payment gateways and as soon as the payment is done, ticket is generated on the server and sent to the user in the form of a QR code. The payment gateways provided will be through credit cards or prepaid services. The ticket is also stored in the database so that the TC who will use a checker application can cross check from the database if the ticket is valid.

It also provides Alarm features, where application will inform the passenger when the train reaches its destination using alarm system of Android. This project deals with the development and implementation of a smart-phone android application to buy railway tickets which is simple and easy to use.

II. LITERATURE REVIEW

1) Indian Railways, the world’s largest railway network, carries 8.101 billion passengers annually which roughly translates to 22 million passengers per day is currently dealing with a lot of problems, including people travelling without tickets thus leading to trains being overcrowded and Railways facing Huge Losses.

However there is still no facility which provides Railway Tickets in the form of QR Code and also expires once the desired destination is reached. Our app also provides a checker application which TC’s can use to validate the ticket of the passengers which are already saved in our database at the touch of a button and thus easing out the entire process.

2) The current ticketing scenario is facing a lot of issues, the main one being standing in a long Queue. Every person needs to stand in the queue for purchasing tickets. With the technology growing so rapidly, this must be changed too. The new technology must be enhanced and adopted on an immediate basis with the already upcoming online technologies and payment gateways making its way through the market and being a big success.

This paper discusses the issues in purchasing the tickets while travelling through railways and explains how to purchase tickets through any Smartphone when the passenger doesn’t want to stand in any queue for buying tickets. It uses Global Positioning System to detect passenger’s location travelling from any source to any destination. It can help the governmental organisation to identify thieves and robbers travelling through trains. As soon as passenger gets down from the train, his or her ticket will automatically get deleted from his Smartphone. So the person cannot use this ticket again for travelling. This paper suggests a user friendly automated ticketing system which will create his ticket in the form of a QR Code automatically detects its location and get deleted on its own once the destination is reached. In brief our app deals with the identification and ticketing of the passengers who travel by trains regularly.

3) This system aims at booking Sub-Urban Railway Tickets in a simple way. The “M-Ticket” facility is not available and fails with the local travel tickets. Our Proposed
System is used to generate the Railway ticket as QR Code which can be carried in smart phones. The “GPS” facility in Smart Phones is used to validate and delete the ticket automatically once the passenger reaches his desired destination. The passenger’s Information is also stored in our MySQL database for security purpose which again lacks in present suburban system. The passenger’s ticket information is retrieved from the Cloud Database using the Ticket ID of QR Code.

III. METHODOLOGY

A. Personal Information Gathering
The work here starts during the first time installation of our application. It gathers the basic customer information like his/her First name, Last name, Date of Birth, Email ID, Mobile Number, City, etc., and it will be stored into our SQLite database. When the user buys a ticket, this customer information is used in the generation of QR Code which will contain this information and is also sent to the database for security purposes.

B. Ticket Buying
The user selects Source, Destination, Class, No. of Adults and Child tickets if any, Ticket type, for e.g., Return or single etc. Then the user advances to the payment gateway to make the payment for the ticket where he choose from a number of options for payment which are Debit/Credit Card, Net banking, Prepaid Services, etc. Once the user chooses any of these options the application moves on to the Pin Code validation/OTP module.

C. Pin Code Validation
Once the customer hits the buy button a PHP code in the railway server validates the pin number and passwords, if it is successful, it saves both the journey details and customer info in the server's MySQL database. After which ticket number and time of buying is generated by the PHP code and the balance credit value is displayed [4].

D. Generating QR Code
Once the PHP code generates the ticket number and time of purchase, the details saved in the MySQL database are sent to Google Chart API engine in order to generate the QR code. Here, all the personal and ticket information are converted into QR codes and sent back to the user mobile as HTTP response and saved in the application[1].

E. GPS Ticket Validation
In this module, the GPS plays the role of the checker, where, when the user buys the ticket, the source geopoints, destination geopoints, ticket type, expiry time & date are stored in a mobile SQLite database. This service checks the user's current location in accordance with the destination geopoints, after which the ticket type is checked and accordingly the ticket is deleted if the geopoints of the destination are matched [7].

F. Checking QR Code with QR Reader
In this module the checker will have a QR Code reader and can scan the QR code with the same application itself in order to validate QR code and verify the journey details, especially the time and date of the ticket [4].

G. Checking with Database
If suppose the user's display is being damaged and not able to scan the QR code due to other reasons like battery failure, we have Another failsafe option to check the ticket by searching the ticket database with the user's login id for validation purpose[6].

IV. FUTURE SCOPE
Railways Ticket generation using QR Code and validation using GPS is a revolutionary idea in both aspects which are Automation and the Security it provides. The paper mainly focuses on theoretical aspects as well as practical implementation.

The Proposed system can be integrated with proprietary applications like M-Indicator & UTS along with Paytm and Freecharge to achieve automation and security at a much higher level altogether.

V. CONCLUSION
In this paper we have discussed about our proposed method of Railway Ticketing and its validation using GPS and as an additional feature, the RFID technology. Location tracing and attendance marking will be done by GPS enabled device of the staff. This technology can also be used for authentication and administration purposes. We are developing this application in android platform but this system can be further developed in other Operating Systems for future scope.

REFERENCES


https://developers.google.com/maps/documentation/geolocation/intro
