

Android Railway Ticketing with GPS as Ticket Checker and using QR Code scanner

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ABSTRACT

This paper deals with the android application for ticket reservation and validation using mobile tower network. One of the major challenges in the current ticketing facility is buying ticket standing in the queue. This application provides the facility for buying the tickets online. The ticket can be bought with the help of Smartphone application where the railway tickets are carried in the phone in the form of quick response code. The ticketing information of the user is stored in database. The proposed system uses the Smartphone facility to validate the ticket and delete it after specific interval of time once the user reaches the destination. This application also includes the automatic fine deduction facility if the user tries to extend the journey. Also the ticket checker is provided with the checker application which is used for the validation of the ticket. As soon as passenger gets down from the train or metro users ticket will be automatically deleted from the Smartphone. So the user cannot use this ticket again for travelling. This paper suggest a user friendly automated ticketing system which will automatically deduct the passenger's fare according to the distance travelled as well as detect the passenger's identification and deals with the identification and ticketing of the passengers sitting in the train.

Keyword: Android, SQLite, QR code, GPS

ARTICLE INFO

Article History

Received: 9th October 2015

Received in revised form :

9th October 2015

Accepted : 12th October 2015

Published online :

13th October 2015

I. INTRODUCTION

The effective public transportation systems are seen as a fundamental requirement for modern society, not only to satisfy basic mobility requirements, but increasingly to ensure that time, resources and assets are used in an efficient manner thereby minimizing adverse impact on the environment. The public transport offers a service and generally users need to present a ticket to prove that they are entitled to travel. Few years before, E-ticketing came into existence and passengers use to register through it or buy tickets. After which months before a new technology called M-ticketing (Mobile Ticketing) was introduced where customers messaged to the web portal through mobile phones after which a complete web page download to the mobile phone where users can do the same booking process as it was in the e-ticketing facility.

This proposed application can be installed only on smartphones. When user will buy tickets, the ticket will be

in the form of Quick Response Code. The GPS facility which is available in the Smartphones is used for checking the tickets and the Quick Response code will be deleted from smartphone automatically once the passenger reaches the destination. All the information of passenger will be stored on cloud database for privacy purposes. Ticket checker will be provided with QR code scanner, with which he can get the complete details of the passenger.

This technology is expanded and is being utilized in the field of transportation in past few years. Few years before E-ticketing came into existence and passengers used to register through it and buy tickets after which months before came a new technology called as M-ticketing where the customer messaged to the web portal through mobile phones after which the user can do the same booking process. But user faces inconvenience and suffers if they forget the travel cards and then stand in the queue for their tickets ,which is where m-ticketing-ticketing was unable to lay there foot

marks. As a solution to these issues an android mobile application can be made which will comprise of all the functionalities where one can buy tickets and carry your railway tickets in the Smartphone as a quick response code. The users ticket information is stored in a cloud data base for security purpose which is missing in the present system. This system provides the ticket checker with checker application to search for the users ticket with the ticket number in the cloud database for checking purposes. Here QR code serves as the ticket to the user. A QR code is a type of matrix bar code first designed for automotive industries. If suppose the users display is being damaged and not able to scan the QR code due to other reasons like battery failure user have another failsafe option to check the ticket by searching the ticket database with the users ticket number for validation purpose. In the past few years there were more advancement in technological field through which it is very easy to buy the tickets for user. The aim of this user system is to ease the suburban ticket issuing system. This will help people to easily book the suburban tickets without any problems. With this application any number of tickets can be issued as it involves use of mobile phones for buying ticket. The online ticket can be bought with just a smart phone application, where user can carry the railway tickets in the smart phone in pdf form. First user has to install this application in their android mobile phone. After installing this application next phase is registration in this phase user is creating their own account using user_id & password. Using this user_id & password user sign-in to the application. The user recharge their account with certain amount through manual recharge at ticket counters or through their debit cards. The user can also check balance transactions easily. To book the ticket using this application the user have to enter destination place and source place is located by server. After that ticket is generated with unique ticket-id & this ticket store into the application in the pdf format. This ticket contains unique ticket-id, time of transaction & name of source and destination. Along user application the ticket checker application is also provided to search for the user's ticket with the unique ticket-id in the main server for checking purposes. Ticket checker put user ticket-id into their application to check user ticket is valid or not.

II. RELATED WORK

QR Code:

A QR code is any code that users find on most of any items that they buy from the store. QR codes have come a long way and now that they are integrated into the online world it's a true phenomenon. It makes searching for online products, shopping and buying much easier. Now, users are going to use it for buying tickets. Creates an image in real world and acts like a web link for the smart phones. It actually grabs the code scans the item and goes online searches for the item which then give users so many details about the product. The user gets specific details as per user choice and reviews about the product you have just scanned from the scanner. When user scans a QR code a magazine, a newspaper or wherever the iPhone or Android will to go to

a website where the user will find much of promos, coupons, maps and many more information. QR codes now are used in a much broader context, including both business tracking applications and convenience-oriented applications aimed at mobile phone users, to open a Uniform Resource Identifier (URI), or to compose an e-mail or text message. Users can generate and print their own QR codes for others to scan and use by visiting one of several paid and free QR code generating websites or applications. It has then become one of the most-used types of two-dimensional barcode.

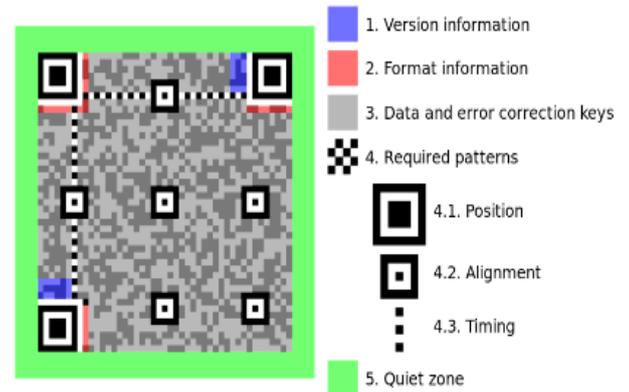


Fig 1:- Structure example of QR code

A. Encryption

Encrypted QR codes, which are not very common, have a few implementations. An Android application, for example, manages encryption and decryption of QR codes.

B. Encoding

The format information records two things: the error correction level and the mask pattern used for the symbol. The mask patterns are displayed as a grid that is repeated as necessary to cover the whole symbols. Modules corresponding to the dark portion of the mask are inverted.

C. Risks

Malicious QR codes combined with a permissive reader can put a computer's contents and user's privacy at risk. This practice is known as "attagging". They are easily created and can be affixed over legitimate QR codes.

III. PROPOSED SYSTEM

An android mobile application can be made which will comprise of all the functionalities where one can buy the urban tickets and carry the urban railway tickets in their smart phone as a Quick response code. Mobile devices like smart phones are emerging in the field of transportation services where technology is being used for data collection, location based transportation services and decision making when it comes to travelling. Comparatively study with QR code which gives the idea about how QR code is more efficient than RFID and barcode systems. Which will be

compared in parameter such usability cost, executions, requirement, appearance etc. The current railway or metro ticketing reservation system is human dependent, time consuming when it comes to ticket booking process and non reliable. The objective of this project is to develop an android application which will serve as medium for students/employees/anyone to book a ticket to travel through metros or locals. The main motive of the application is to ease the process of ticket booking by avoiding the hectic process to stand in the queue and book the ticket for travelling in the train. There are several applications available in the market giving the information about the travelling destinations and their fares. But none of these applications include the ticket booking process. Moreover the tickets book on the websites has to be saved and printed so as to be shown at the time of boarding.

Whereas, this proposed application differs as it would not only book the tickets but also save the ticket in the form of QR code. This QR code can be scanned through the other mobiles and saved as well which can be shown to the ticket checker for validation. Apart from the validation and reservation of ticket this paper proposed a system for the fine deduction where in if the traveller tries to extend the journey then the destination will be traced through mobile tower and the fine will be automatically deducted from the user account. This makes the entire process very easy. The data about ticket and personal information will be securely stored onto the database. Also the users application would require the user to create an account so that it can be used by multiple users and would be independent of devices. The user can login to any mobile device having application installed. For buying the tickets the user select source, destination class number of adult and child tickets ticket type like single and source etc .

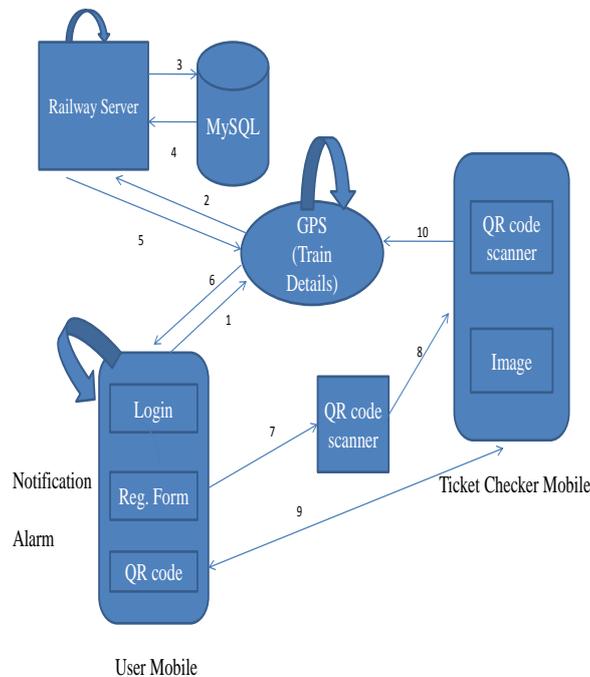


Fig 2: System Architecture

Architecture Description:

It is actually a cloud based application. In which data will be saved in cloud database using web services. It includes following steps:

Step 1: The work here starts during the first time installation of our application where the user has to sign up. During sign up the basic customer information like first name, last name, date of birth, mobile no, city, state etc., will be gathered and it will be stored into MySQL database. So every time when the user buys the ticket this customer information is sent to the database for security purpose and also the ticket is generated accordingly. During sign up the username will be set as the user’s mobile number and the password will be as per the choice of the user. On the other hand if the user has an account then he can sign in directly. Thus the user can use different android phones and will not be restricted to only his phone. The above information will be send to server with the help of internet.

Step 2: The user selects source, destination, and number of tickets and choice of switches of stations. Then the user is directed to the payment option. Payment can be done through prepaid services, i.e. the balance of the mobile no will be displayed along with the cost of the ticket and if the user agrees to proceed then the equivalent ‘amount’ of the ticket will be deducted from the balance of the mobile no. The user can also use credit card for paying fare for the ticket. Thereceived information will be hosted b the glassfish server and helps to queue the incoming information. Web services will use SAAS (Software As A Services) for becoming application as platform independent.

Step 3: Once the customer hits the buy button a 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. Step 4: The code on the server side generates the time of buy and the expiry timing of the ticket; the details are saved in the railway’s MySQL database. Then a Quick Response code is generated on server side, saved in the database and also sent back to the user mobile and saved in the application memory which serves as a ticket for the user. Step 5: In this module the checker will enter the quick response code which will validate and verify the journey details from the railway database, especially the time and date of the ticket.

IV. PROPOSED ALGORITHM

- 1: Let $A \in C^{n \times n}$. This algorithm computes an upper triangular matrix T and a unitary matrix U such that $A = UT$
- U^* is the Schur decomposition of A.
- 2: Set $A_0 := A$ and $U_0 = I$.
- 3: for $k = 1, 2, \dots$ do
- 4: $A_{k-1} = Q_k R_k$; /* QR factorization */
- 5: $A_k := R_k Q_k$;
- 6: $U_k := U_{k-1} Q_k$; /* Update transformation matrix */
- 7: end for
- 8: Set $T := A_\infty$ and $U := U_\infty$.

V. ADVANTAGES

- Induction of this technology will facilitate travelling ticket examiners to allot vacant seats to short distance passengers.
- It will enable TTEs to update the status of passengers who are turning up for the journey.
- After this updating, reservation server will come to know about the seats of absent passengers and will allot those seats to RAC/WL passengers informing them by sending an SMS.
- After allotting the seats to all the RAC/WL passengers, if some seats still remain vacant then it will be reflected as available seats across railway network and it could be booked by any passenger which is willing to travel from the upcoming station.
- Revenue of railway is increased.
- Procurement of tickets by touts is eliminated.
- It attempts to reserve each and every seat even vacant for one station to next station.
- It maintains the transparency in berth allocation and makes the ticket checking process fast.

VI. CONCLUSION

In this paper a mobile ticket application developed for Android 1.5 using Java, SQLite, MySQL, and PHP on the server side which can change the way people buy their tickets in future. This kind of ticketing application can be applied to any kind of transport system. The android application is one of its kinds and finds huge application to buy sub-urban railway tickets through android mobile. Also this application saves work for ticket checkers by GPS validation of tickets and also moving from manual ticket checking process to digital ticket checking process by just scanning with user own android mobile to validate the ticket. At the station level security user can have Hardware devices to validate the QR codes before the user enters or leaves the station, where the user can have access towards platform after being validated by the hardware device. Time trains will be available will also ease the user to allot his time accordingly to reach the station, so in this project users will be using GPS here to find the location of the user and nearby train station to display the train. Hence problem of issuing local train tickets has been solved with new application. Still more advance modification can be a Dynamic display of Train locations by fitting GPS devices in trains to show its location in the Google map display which is available in this application.

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