

Android Application for Metro Railway Ticket Booking and Checking Using QR-Code and GPS

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Abstract—Technological development has resulted in a boundary free digital world. This development has resulted in transaction through virtual money instead of real ones. Use of the smart cards has reduced waiting for ticket but the user should always remember to carry the card with him. And he/she has to pay attention to the card that it is not lost or stolen. After that came E-Ticketing, where passengers have to carry a SMS or a printout of the ticket booked online. The “Android Metro Railway Ticketing” (AMRT) is the implementation of a smart phone application and it can be used easily anytime, anywhere and ticket will be present in the customer’s phone in the form of “Quick Response Code”. GPS facility is used for validation of the ticket at the source and destination, where ticket expires once it is rescanned. The information about purchased ticket is stored in firebase. The information of every user is stored in a cloud database for security purpose which is unavailable in the current metro railway system. Also ticket-checker is going to be given QR-code scanner, with that he/she will get the complete details of the user, along with the ticket number and status of the ticket.

Keywords—Short-Message-Service(SMS),Global-Positioning System(GPS)

I.INTRODUCTION

In the past few decades, technology has expanded to a huge extent and also is being utilized in the field of transportation services. Also our honorable Prime minister of India Narendra Modi, started a new project called as “DIGITAL INDIA”, is an initiative step for the Government of India to ensure that government services are made available to citizens electronically by improving online infrastructure and by increasing internet connectivity. The first metro station was started in the year 1984 in Kolkata which was inaugurated by our former Prime Minister Indira Gandhi. Presently there are 10 metro stations in India; by 2025 we have 15 more metro stations. It is difficult to by tickets manually in this busy world. So we implemented an android metro application. This system is a web based application which provides information regarding metro timings, routes, fairs. This system also manages public feedback about services through its complaint management system. It also contains an user module where users can recharge their railway wallet online through this site and can buy the metro tickets in the form of QR-code which will be saved in user’s smart phone in an encrypted form. GPS facility is used for automatic ticket checking, validation and expiring of tickets at desired points. The information about a particular user is stored in cloud database for continuous and easy availability

anywhere and everywhere. The information about the tickets and routes are also stored in cloud database and are retrieved when required. There is also an admin module where admin can add stations, routes and also update the fairs. The admin is a panel consisting of a group of authorized persons. And the ticket checker module validates the ticket. Every metro station routes are indicated by color coding lines. Color coding helps commuters identify the line beyond intersections. Since in an area of few sq kms there is very dense network hence colors are easily perceived by brain and line identified quickly.

II. REVIEW OF LITERATURE

Ferreira J,(2013) has studied Android as a Cloud Ticket Validator where AMRT is actually a cloud based application. In which data will be saved in cloud database using web services. So that all the details of user will be stored in the cloud database and can be accessed easily .Initially, the user has to install the 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 My-SQL 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. On the other hand if the user has an account then he can sign in directly where username is mobile number. The user information will be send to server with the help of internet. It is actually a cloud based application [1].

Vrijendra Singh,(2012) proposed a Dynamic Seat Allocation (DSA) system which considers the advantage of QR-code processing along with one of the standards of wireless communication. Their approach is to make fair processing in seat reservation or allocation in Indian Railway. The Android Metro Railway Ticketing System carries a ticket in the form of Quick Response Code (QR). Security is ensured by the use of QR code. All information about the users is stored in cloud database in encoded form thereby ensuring constant availability and security [2].

Tushar Dongare,(2014) Babar suggested a model which provide various techniques for buying tickets through their Smartphone application through GPS facility of android mobile so that passenger can easily get the list of stations and he can easily buy tickets, but Sometimes GPS signals are not accurate due to some obstacles to the signals.GPS is used to validates the ticket when the user reaches the station and deletes the ticket automatically after the destination is

reached. For security reasons the information about every user is stored in cloud which is to be accessed for each ticket booking for validation purpose [3].

III. PROBLEM STATEMENT

To design and develop an android application for maintaining the details of the user, QR-Code generation and validation of the ticket.

IV. OBJECTIVE

- To provide the Smart way to scan the ticket through QR code.
- To provide Check-in, Check-out and on-spot booking procedure.

V. PROPOSED METHODOLOGY

This system is actually a cloud based application. The data will be saved in the cloud database. Initially, the user has to install the android application where the he has to enter his details where adhaar number is mandatory. During signup, the user has to enter his details like adhaar number, username, mobile number etc which will be stored in the firebase. When the user want to buy the ticket he can enter username and password which is sent to the database for security purpose if it is valid then ticket is generated accordingly. If the user lost his phone he can open it in others phones and is not restricted only to his phone. When the user enters his details it will be sent to the firebase with the help of database.

VI. SYSTEM ARCHITECTURE

The system architecture in fig1 will show how the system will work and how it is going to be executed. First, the user has to sign up for using the android application. Once the user has entered all his details then he can book his ticket by selecting book ticket option in the menu.

Once the user has booked his ticket and clicked on submit button, then the ticket information is sent to the firebase via internet and also user details are stored in the firebase. The

http response from the firebase is sent back to the application. The QR-Code is generated on the server side, saved in the firebase and sent back to the application memory which serves as ticket for the user.

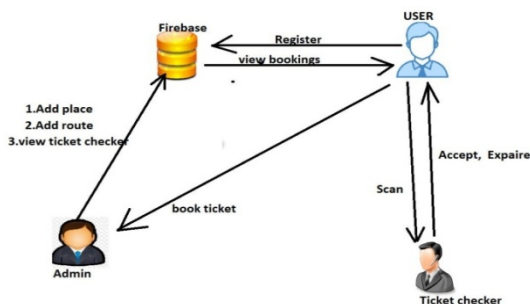


Fig1: System Architecture

VII. WORKING

- 1) *Personal Information Gathering*: The work here starts with installing our application. It gathers the basic information about the user like Adhaar number, Name, mobile number, etc and these details are stored in the firebase. When the user wants to buy the ticket just he need to enter his username and password which is sent to firebase for security purpose.
- 2) *Ticket Buying*: Once the user has successfully login, then he can book the ticket by selecting the source station, destination station and number of tickets required. The cost of booked tickets will be displayed below when user click on submit button the amount will be deducted from user railway wallet and ticket will be generated.
- 3) *Generating Quick Response Code*: When the user books the ticket then the information is sent to firebase and the QR-Code is generated on the server side and sent back to the application. The QR-Code contains the ticket number, username, source and destination stations.
- 4) *GPS Ticket Validation*: Here the GPS plays the role of ticket checker. It contains details like when the user buys ticket, source geo points, destination geo points, number of tickets, date, expiry time everything will be stored in firebase. The service checks the user location with destination geo points. When the ticket is rescanned then the ticket will get expired and ticket will be valid only for one day within the metro timings.
- 5) *Checking QR-Code with QR-Reader*: In this module, the checker will be having the QR-Code Reader and scans the QR-Code in the application in order to validate the ticket. If the user has exceeded the destination station then amount will be deducted from his wallet. Otherwise, if user has dropped in between station then amount will be refunded back to his account.

VIII. HARDWARE AND SOFTWARE REQUIREMENTS

SOFTWARE REQUIREMENTS:

- Operating System: Windows 7 Ultimate.
- Coding Language: Java.
- Front-End: XML.
- Data Base : Firebase
- IDE : Android Studio

HARDWARE REQUIREMENTS:

- System: Pentium IV 2.4 GHz.
- Hard Disk: 40 GB.
- Floppy Drive: 1.44 Mb.
- Monitor: 14" Color Monitor.
- Mouse: Optical Mouse.

➤ Ram: 512 Mb.

IX. IMPLEMENTATION

For booking the metro ticket the user has to register by entering his details like name, adhaar number etc. After registering the user can login, if he enters invalid password /username then he will not be able to book his ticket, but if it is valid, then he can book his ticket. The ticket is generated in the form of QR-Code and ticket checker scans the ticket by QR-Code Reader to validate the ticket.

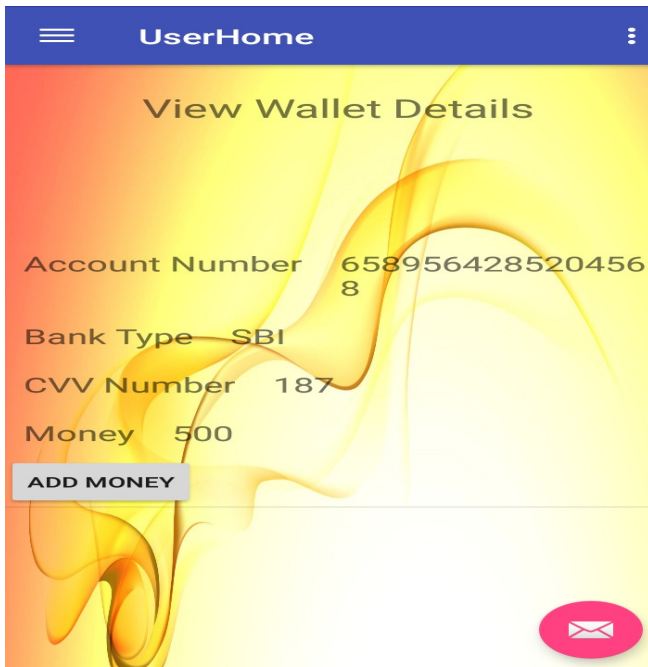


Fig 1: User wallet details

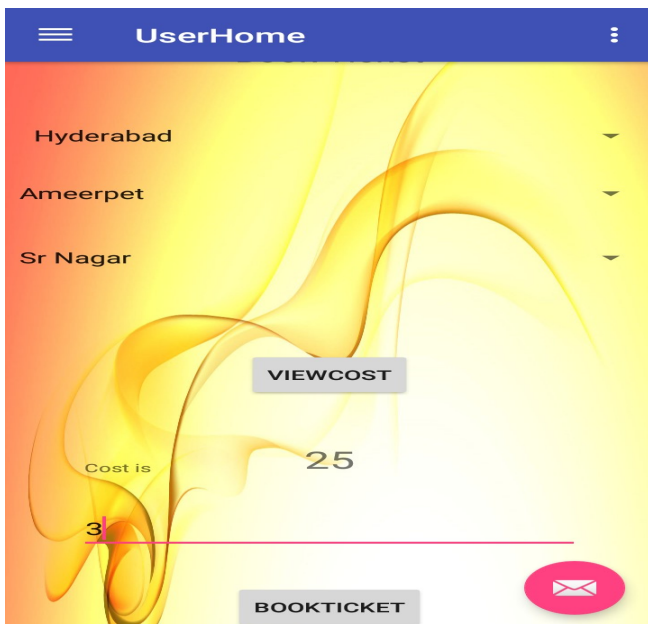


Fig 2: User Journey details



Fig 3: QR-Code Generated

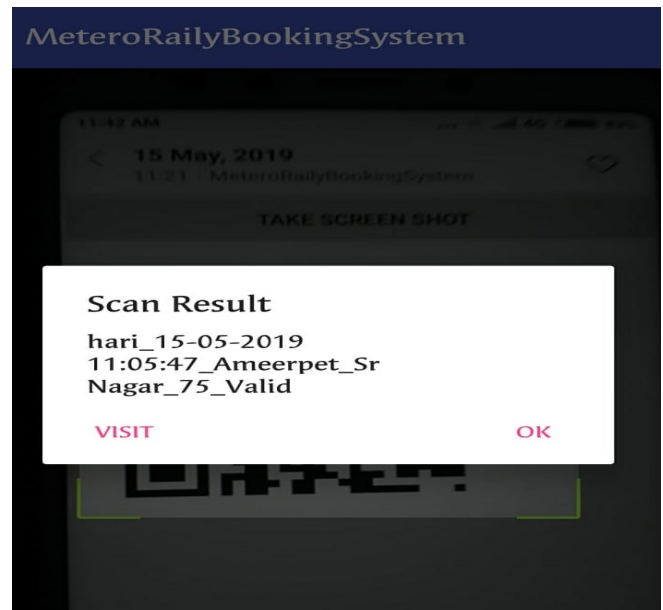


Fig 4: Ticket scanned at source station

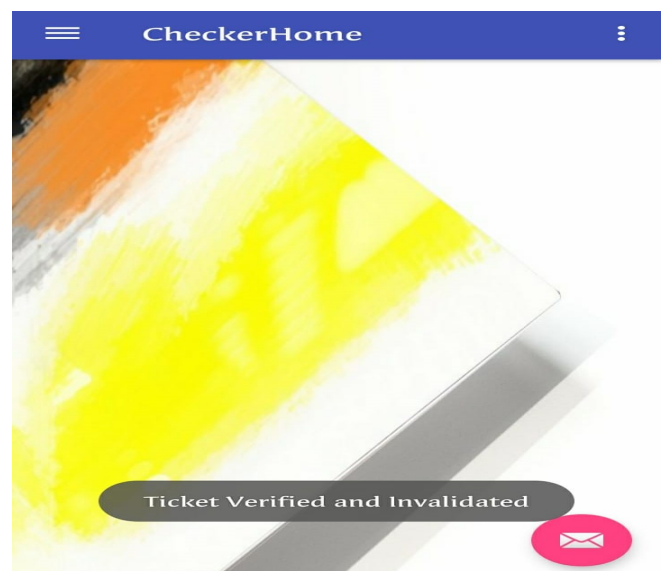


Fig 5: After ticket is scanned at destination

X. CONCLUSIONS

The system has been developed with much care and free of errors and at the same time it is efficient and less time consuming. The purpose of this project was to develop an Android application for metro railway management. The entire system is secured. Also the project helps one to understand about the development phases of a project and software development life cycle. Besides getting benefited for the knowledge gained this project is very useful in daily life and can be efficiently implemented or worked upon. The proposed ticketing system is presented in this paper, the operation would be fully automated, efficient, enhanced and cost-effective. The proposed system can also be implemented in other places like tollgates, bus ticketing and others.

XI. FUTURE SCOPE

There is always scope for innovation when it comes for technology. Even our project is no exception. Some improvements has to be made in the future. And making use of GPS to track down the location of the passenger and the nearest station.

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