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Application for online booking of unreserved ticket for Indian Railways

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ABSTRACT

The number of passengers traveling in Indian Railways is increasing very rapidly. Among those people, there are some set of persons who travel regularly in the General Compartment. IRCTC has created an online platform for booking tickets of Reserved Compartments. The customers who travel in General Compartment still face an issue because they are supposed to wait in Long Queues at Ticket Counters to purchase tickets. In this proposed system we aim to provide a solution where passengers traveling in the General Compartment have a facility to book their travel tickets online using an Android Application.

Keywords— IRCTC, General Compartment, Android Application, Firebase, XML, Java, NoSql, Google Map API

1. INTRODUCTION

Railways have always been an integral part of trade and transportation section. It has stitched a significant role in the employment sector of India. With Indian rapid economic development, the railway lines and passengers have been increasing year by year in the country. This leads to the need of a portal or application that can enable the customers to book the tickets for their journey online and at a quicker pace.

The system proposed by our team is an android application which is named as Instant General Ticketing Service (IGTS). The project attempts to resolve the issue by migrating the unreserved ticket booking means to online application. Similar to online reserved ticket booking system as furnished by IRCTC this application attempts to provide enough information on the time table of the trains running on the mentioned date and to book a ticket in the same. The reason for using an android application is that it enables easy design of GUI and connectivity to the backend of the system. Keeping the fact into picture that majority of Indian Mobile users are android users this application

can scale itself to a larger extent. It provides an ease of booking the general compartment ticket for passenger at his/her convenience such as sitting at home or while being on the way to the station. This can also lead to the reduction of accidents or crowd gathering at the ticket counters which has been increased in the recent days as majority of population is inclined towards railways for the mode of transportation. The authenticity of ticket confirmation can be checked by Ticket Collector straight away from the application instead of going in the traditional way again which can reduce the black marketing of ticket as the system has been digitalized.

2. SYSTEM DESCRIPTION

The ultimate goal of designing an android application is the purchase of general compartment ticket using smart android phone as the medium. The application requires the users to register on the application server to record an entry in the database so that they can access the application from thereon. The user records saved in the database is an entry point for the passenger to obtain the ticket. This user record comprises of the information about the Username, corresponding Password, and Date of Birth, Unique Identification number such as Aadhar Number/PAN Number, Gender, Mobile Number and Email ID.

Apart from daily unreserved bookings, the proposed system also supports booking of platform tickets. User can directly book a platform ticket using the application, and use it as a digital ticket from 'Show Ticket' section. People in hurry to receive or drop the travelling passenger usually miss out to buy the platform ticket for which they are supposed to again go through the action of buying the manual platform ticket. This service of application effectively deals with the above mentioned issue.

The ongoing system has a separate service for the Ticket Collector (TC) to login as the official and enter the train number. This submission will result in fetching the list of passengers

travelling in the mentioned Train no, so that the TC will have a check list to cross verify with. Now, given the payment once gets completed, the passenger will be showcased a confirmation layout which can be accessed from the booking history. This layout contains a QR code that has Username, Date of Journey, Source and Destination encoded into it. Railways official can employ a QR code scanner tool to scan this QR code and retrieve the relevant information to verify the ticket booked. Another alternative employed in updating user regarding confirmation of ticket is by sending him/her an email once ticket is booked. The email contains textual confirmation message along with an attachment PDF which contains relevant information of the passengers reserved on that particular ticket.

Dashboard of the system has an option named “Booking History” from where user can fetch the confirmation layout any time needed for all the past tickets booked thus enabling it to track all the journeys made.

Another convenient feature of the application is station locator. Employing the Google Map API, the route module has been embedded into the system which enables user to get the direction to the selected source station from its current location without surfing through the internet for its address.

3. SYSTEM DESIGN

Software development is a complex procedure concerned with many aspects of the proposed system and use cases involved in it. The conventional method follows development of such software application through Software Development Life Cycle (SDLC). Now system design is the second stage of the mentioned cycle.

3.1 System architecture

The proposed application is an example of Three Layered Architecture as shown in the figure 1.

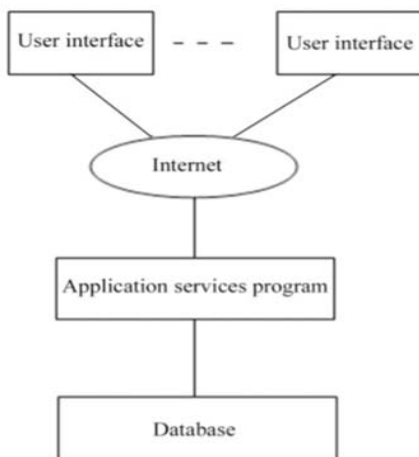


Fig. 1: Three layered architecture

3.1.1 Database layer: Our system has employed a NoSQL Google Firebase database that stores the data in JSON format. The benefit of using Firebase database is the provision of dynamicity of backend data.

3.1.2 Application service layer: The system functions and business logic are handled in this layer. The application service layer also updates data in the database, according to the service request of the top layer.

3.1.3 Customer interface layer: Being an Android Application, we have used the Android Studio for designing the customer interface. The interface elements are designed using XML and functionalities are accomplished using Java.

3.2 Process flow

The process flow of Instant General Ticketing System is shown in the Fig. 2. The application front end is meant to provide services for User and TC. These two use cases are responsible for querying the database and making relevant alterations to it by performing different actions over it.

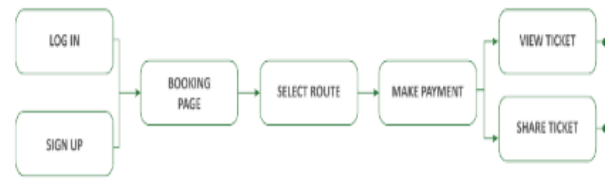


Fig. 2: Flow diagram [7]

3.2.1 Sign up: User starts with the sign-up procedure when visiting the application for the first time, where he/she provides the credentials.

3.2.2 Login: If user has already been registered, it logs into the application for which he/she enters the credentials in the login page. These credentials include the Registration User name and corresponding Password.

3.2.3 Select itinerary: Post successful authentication the user provides the following itineraries:

- Starting station
- Destination station
- Number of passengers

3.2.4 Check train availability: This counterpart displays the list of trains running between selected source and destination station along with the arrival and departure timings for each of them, if available.

3.2.5 Book tickets: Users will specify the name and age of each passenger, and submit the data to book tickets.

3.2.6 Make payment: User will make the payment electronically using a payment gateway. In current scenario, the payment gateway is just an external system that validates the payment information.

3.2.7 Confirmation layout: On successful payment, application presents the confirmation layout that mentions Username, Time, Source and Destination. The same information is also encoded in the QR code displayed in this layout and along with this a confirmation mail is send for the same.

4. GRAPHICAL USER INTERFACE

4.1 Login

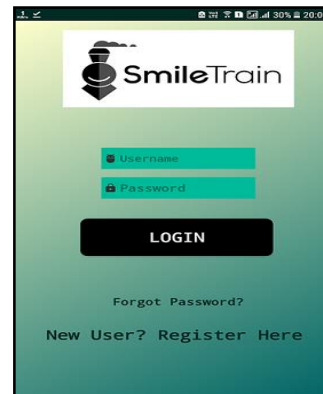


Fig. 3: Login page GUI

The figure 3 is the first page of application. As shown, the user enters its Username and Password provided he/she is already registered. If not so, user can Sign Up the text view “New User? Register Here”. Again there is a provision for the user to re-create the forgotten password. The Firebase has inbuilt service that asks for the user’s registered Email Id and sends a link to change the password. This change is also reflected in the database automatically.

4.2 User registration

The mentioned details, as can be seen in the Fig.4 are to be fetched from the user for the purpose of registering the user account. Successful registration, after cross verification of duplicate entry in the backend, leads to displaying a toast message of confirmation.

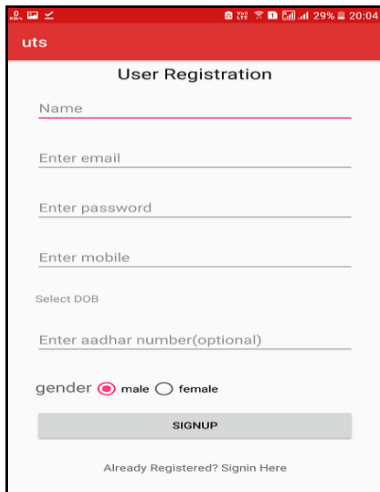


Fig. 4: User registration GUI

4.3 Platform ticket

Observations made from Fig.5 states that the user can enter one of the available stations to obtain the platform ticket and the number of tickets as well, for which the fare changes automatically. As the user proceeds to type the station name the automatic suggestions will be thrown that matches the typed initials, provided the station is present in the list.

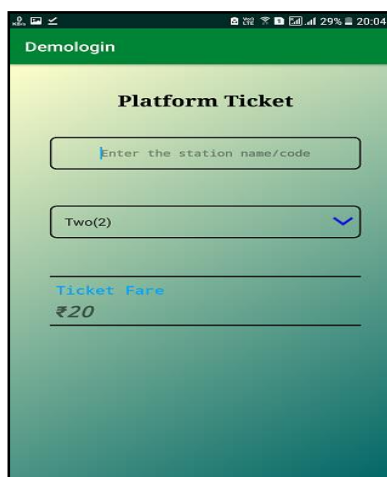


Fig. 5: Platform ticket

4.4 Maps

From the figure 6 it can be concluded that the passenger is able to view the exact location of the desired railway station (Majestic Railway Station) from its current location (Vadodara) directly from the app. The API works by obtaining the location parameters such as longitude and latitude of both source and destination. This API is embedded in project.

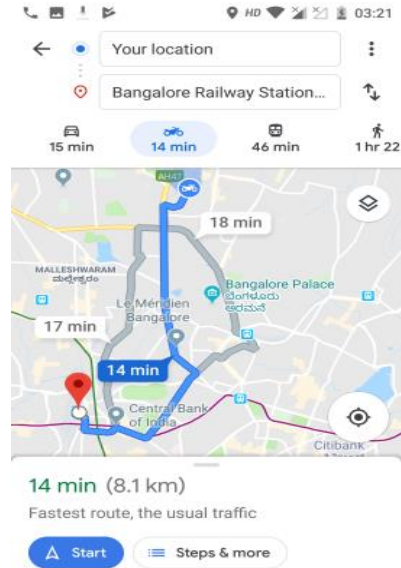


Fig. 6: Current location (RT Nagar) to majestic railway station

5. BENEFITS

Listing the benefits out as they include:

- Risk of carried cash loss is avoided
- Payment convenience and easy management of purchases, utility bill and similar financial transactions.
- Enables exact payment with reduced transaction cost.
- Financial transactions are secured and authenticated, for which a proper record is maintained to increase tax base and facilitate better tax compliance.
- The less the cash is used, the lesser the money laundering and thus helps in economic growth of country with better transparency in tax compliance.
- Digital transaction has led to restrain in corruption and flow of black money, as every transaction requires approval of bank and its authentication.
- Digitalization has somewhat reduced the economy required to print paper currency notes and its transportation.

6. CONCLUSION

The proposed system addresses the issue of unavailability of the Online General Ticket Booking through IRCTC. Although this System has been made available in the handful zones of railways such as Mumbai Suburban Railway, but this proposed handy application is targeted to reach out to a larger section of population enabling them with the provision of Instant Booking of General Tickets. Initially they can be tested for the certain metropolitan cities which have a good amount of crowd travelling on a daily routine. If proven to be successful among them, this can be extended to a larger scale to cover the railway zones of almost entire country.

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