INDIRA GANDHI NATIONAL OPEN UNIVERSITY

MCSP - 060

ONLINE RAILWAY PORTAL

by

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Enrolment No: 170803288

Under Guidance
of
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Submitted to the School of Computer and Information Sciences,

IGNOU

In partial fulfillment of the requirements

For the award of the degree

Master of Computer Applications (MCA)

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Indira Gandhi National Open University
Maidan Garhi
New Delhi – 110068.

INDIRA GANDHI NATIONAL OPEN UNIVERSITY
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REMUNERATION BILL FOR THE MCA PROJECT GUIDE

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This is to certify that I have Guided the following student/(s) for their project work:

S.No.	Enrolment Number of the student	PR No. (to be filled by the Regional Centre)	Name of the student	Title of the Project	Amount claimed (to be filled by the office)
1	170803288		Deepak Kumar	OnlineRail Portal	

……

Signature of the Guide

Date :

NOTE: ***Project guide cannot guide more than five students at any given point of time. This form duly signed by the guide placed in a separate envelope, should be submitted along with the project report. Remuneration Bill not accompanied with the project report will not be considered for payment. The concerned authority will fill the amount.***

X. CERTIFICATE OF ORIGINALITY

This is to certify that the project report entitled **"*ONLINE RAILWAY PORTAL*"** submitted to **Indira Gandhi National Open University** in partial fulfillment of the requirement for the award of the degree of **MASTER OF COMPUTER APPLICATIONS (MCA) ,** is an authentic and original work carried out by Mr. Deepak Kumar with enrolment no. 170803288 under my guidance.

The matter embodied in this project is genuine work done by the student and has not been submitted whether to this University or to any other University / Institute for the fulfillment of the requirements of any course of study.

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Signature of the Student:

Date: ……..

Name and Address
of the student

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Signature of the Guide

Date: ……

Name, Designation
and Address of the
Guide:

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ACKNOWLEDGEMENT

I would like to acknowledge our sincere thanks towards our study center, and its faculties for their valuable guidance and suggestions that have resulted in the successful completion of the project.

I am grateful to all those who have directly or indirectly helped me in completion of the project.

Table of Contents

ABSTARCT

Proposed **“Online Railway Reservation Portal”** is developed for to automate the railway reservation system. It includes modules required to successfully operate railway reversion process smoothly. It has train master to add modify train information, Train schedule to enter train journey details include all the station name, arrival time and departure time. It includes automatic fare calculation as per the distance between two stations.

Reservation module consist of automatic seat no and coach no allocation system. Daily schedule for updation of not confirm seat and coach no.

All master like train master, train schedule, reservation fees, cancellation fees charges can be modified individually from front end and changes reflect in all modules immediately.

Therefore proposed “**Online Railway Reservation Portal**” has been designed to automate the process of railway for ticket reservation and back office activities. System can make the daily activities efficient and providing the fast response.

It included inbuilt user management module to enhance security features as system handles sensitive customer and finance data,

Railway Management System Benefits

- Complete end to end system for all the activities related to railway reservation system.
- Complete web based interface for all the operations including reservation, PRN query, cancellation, system administration.
- Seat allocation facility
- Web based administration module enable system administration to maintain masters like Train, Station, Fare rules etc.
- Supports the full life cycle of ticket reservation, seat allocation, and ticket cancellation. Reschedule the cancel seat to unconfirmed passenger.
- It is a scalable system.
- Has a clearly arranged and user-friendly interface
- Easy to use and minimum data entry, all important details is mater driven and provide in drop down list to make fast operation and avoid mistake.
- Automatic fare calculation from stage master, in new updation of fare in stage master will automatically reflect in all new reservation.
- All important details can be updated by front end master module only.
- Retrieval of forgotten passwords.
- Integrated security features.

Scope and Features

From an end-user perspective, the Railway Reservation System Project consists of three functional elements: Security Module, Master Management Module, Transaction Module and a Query Module.

Security module

Security modules include security features like user management and application level password management..

- Maintain user master- Each user identified by the user name and user type. Only admin user can create, edit user information.
- Password must be 6 characters long.
- Password must be alpha numeric.
- While creating user system assign default password for the user, user must change default password for first time login.
- All login time stamp stored in the system for security audit.
- Access level and roles and privileges are set for different type of users.

Master Management module

Master management module includes following sub modules..

- **Station Master** – Every station is uniquely identified by system generated Station ID. It also includes station code, station name and railway division name.
- **Train Master** – Every train uniquely identified by train no, it includes train name, train schedule which days of the week train will run. No of coaches available for 3 tier AC, First Class, Slipper Class etc.
- **Train Schedule** – It includes train journey details from start station to end station, all in between station, distances between 2 station, arrival and departure time.
- Fare Rule – It help to calculate fare by distance, support different type of fare calculation for different class like AC1, AC3 etc.

- **Cancellation Fees Rule** - It provide the master data for all ticket cancellation fees calculation.
- **Reservation and Super Fast Fees** – It provide the master data for all ticket cancellation fees calculation.

Transaction Module

Transaction module includes following sub modules.

- **Reservation** – This module used to make reservation, it asks for input data like train no, journey date, from station code, end station code. System has powerful validation rule to check validation like journey date must be greeter than system date, journey date must be within 90 days. Train should run for the selected day. Check for from station and to station. Seat availability, While saving the record system generate PRN no, seat no and coach no. Before save the system ask for final confirmation. System automatically calculates the fare and save the details.
- **Cancellation** – For cancellation of ticket it ask for PRN no, after entering the correct PRN no system check for validity of the PRN no, whether it already cancelled, journey date already expired. I it validate system display all the details of the reservation. System automatically calculates the cancellation fees from the cancellation rule master. Before save the record system ask for the confirmation.
- **Update Seat no for unconfirmed passenger** – It is schedule activity, system query for all cancelled ticket for particular journey date and allocates all vacant seat to unconfirmed passenger.
- **Daily Cash Transaction** – It shows daily transaction, like how much money received and how much money refund. All data can be exported to MS Excel for review and save in file system.

Query Module

A powerful query module give on screen information for particular PRN NO, it shows all the reservation details and cancellation details, include current status for the seat no, coach no.

Both of these areas of functionality will be delivered as the first version of the Railway Reservation System is released. Functionality is described in more detail later in this document.

Out of Scope

The following functions are considered out of scope for Version 1 of the Railway Reservation System. Versions 2.0 address items not in scope and those deemed not feasible during V1.0.

Function	**Comment**	**Version**
Linking and integration of any legacy system for accounting.	Required by management to control and maintain the accounting activity	2
Integration with banks and other credit verification agency	Help to updated and share the data	2
Connection to third-party OLAP applications		2
Sophisticated system to host in internet and used to connect all travel agents.		2
Electronic Data Interchange (EDI) system between different department	Aimed to reduce costs and time in the data sharing	2

Goal and objective

This section presents a conceptual overview of the solution, and then provides an introduction to its requirements.

Solution Concept

The Railway Reservation System consists of:

- **Security Modules**:
  Security modules include security features like user management and application level password management.
- **Master Management module**: It includes all master like station, train, all rules which are used to calculate fare and cancellation charges.
- **Transaction Module** – It includes reservation, cancellation of ticket. Update of seat no and coach no for unconfirmed passengers.
- **Query Modules**.
  A powerful query module give on screen information for particular PRN no, system user can view all information for particular ticket in one screen by entering PRN no.

Problem Statement

Requirements Summary

The following preliminary lists are based on initial interviews

Business Requirements

The business goal for the application is to support an increase the productivity and complete automation of existing manual or semi automatic railway reservation process. Business requirements are discussed in the Scope section, with the following additional detail:

- Improve the search facility and system users should get all the information in a second.
- System should have security features in built as it handles sensitive personal and finance information of the customer.
- User must not delete any data, Administrator can only have the rights to delete the data,
- System Administrator must able to control the access rights by each user as per requirement.
- The application should support the capability to use multi user environment.

The system users want to improve their current ability to analyze customer data. In particular, they want to focus on identifying their best customer and who are defaulter. To enable them to accomplish this goal, they want to extract meaningful data that easily answers the following questions:

- What are the early warning signs of problems?
- Who is my best route?
- What is the most used and busy train?
- Payment pattern of the customer?
- Cancellation pattern of customer?
- What are my customers' issues as groups?

User Requirements

User requirements are categorized by user type.

System Users

- Able to search and view the ticket information by only PRN no..
- Able to find all the information like reservation details, seat details, in one screen to give answer to customer query.
- Must able to change the his or her own password
- System must able to calculate all fare automatically.

Supervisor

- All mater details should be updated from front end only..
- All data must be exported to ms excel

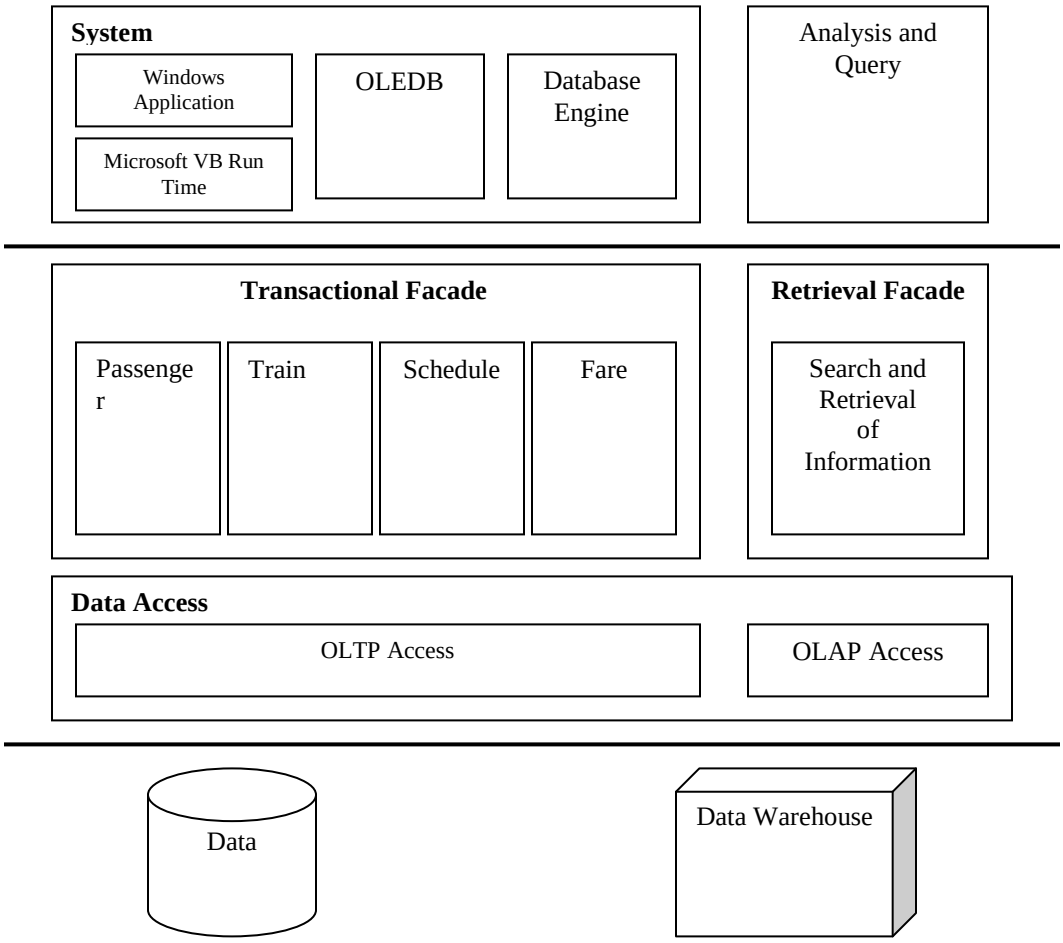
Operational Requirements

The following requirements provide a high-level view of how the system will run:

- Processor usage should not exceed 80 percent during concurrent uses.
- Backups will occur incrementally throughout the day.
- A full weekly backup is required to WORM drives.
- Ensure that information is easy to access either, and meaningful for the system users and the company.
- Minimize the technical knowledge that system users need to access the data, generate ad hoc queries, search and view information.
- Any change to information must be reflected immediately, and the changes must be propagated to the search engine so that system users that perform searches see this new information.
- The application should work with the existing communications and networking infrastructure.
- The application should deploy with a minimum of additional operational processes, manual or otherwise.

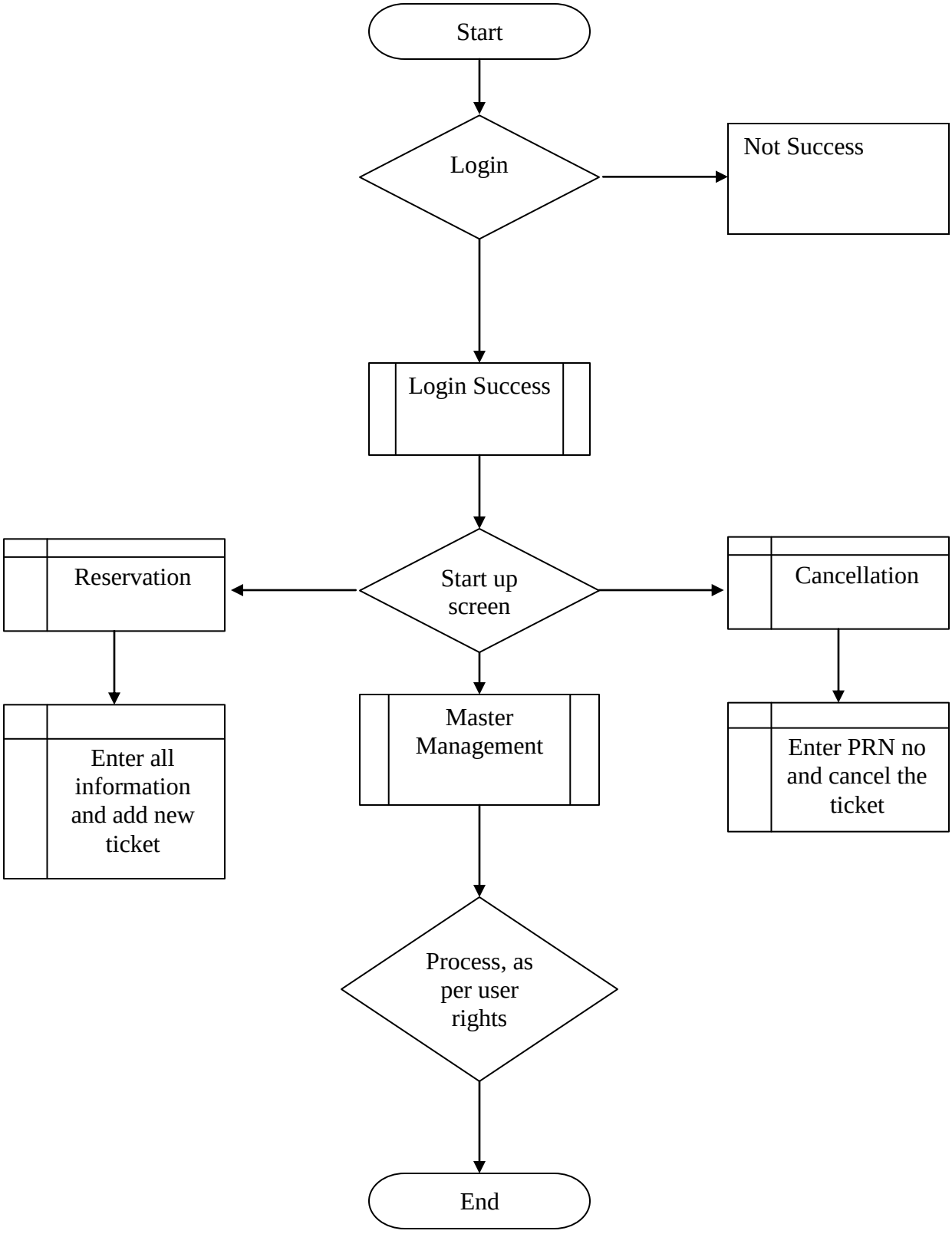
System Architecture

High Level Solution Architecture



High Level Solution Architecture of Online Railway Reservation Portal

Data Flow and Process Flow Chart



User Profiles

The following user types are expected for the Railway Reservation System:

User	Brief Description of Use Actions
USER	Minimum rights to the system, query the information can add, edit some modules.
Supervisor	Reservation, Cancellation, Make, However can not delete any information.
System Administrator	Create new system users, set and alter the role and privilege to the system users for accessing the system resource. Can delete the data. Also responsible to database backup, backend performance. And overall the system performance.

Usage Summary

Railway Reservation System Version 1.0 will address the following use cases. The complete usage scenarios will be completed during the information-gathering process. Use cases will be created and prioritized. Selected use cases will be expanded into usage scenarios and features that are derived from both use cases and the usage scenarios, as represented in the following diagram:

Usage summary use case

Software and Hardware Requirement

Operating Environment

OE-1: The eBanking web application will operate with the following Web Browsers: Firebox, Google Chrome, Internet Explorer

OE-2: The eBanking web application shall operate on a server running the latest versions of Apache-tomcat.

OE-3: The eBanking web application shall permit user access from Internet connection

OE-4: Operating System: Windows 2000. XP

OE-5: Software requirements: MySQL 5, JAVA.

OE-6: Languages used are java, jsp and scripting is done using JavaScript.

OE-7: Hardware Requirements: 256(minimum)/512(recommended) MB RAM

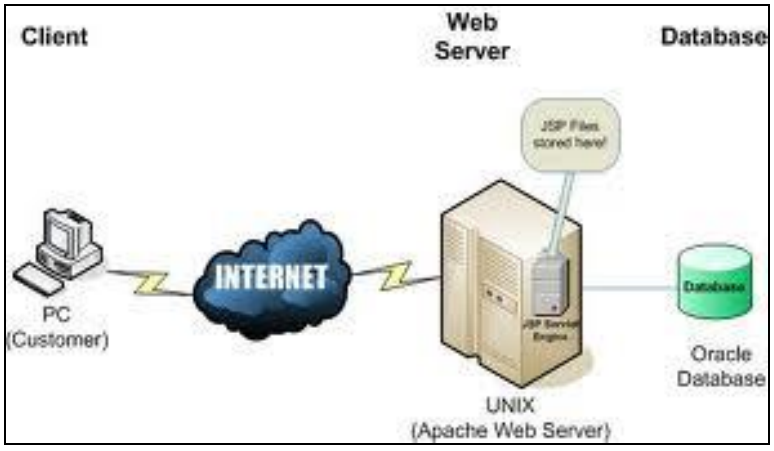
OE-8: Hard disc- nGB depending upon the requirement to store data minimum of 25GB.

Deployment Environment

DE-1: Database Server
OS – Win 2003 Enterprise Server
MySQL 5
HDD – Min 10 GB, Recommended 25 GB
RAM – Min 2 GB, Recommended 4 GB
Processor - Pentium Dual Xenon Processor

DE-2: Application Server
OS – Win 2003 Enterprise Server
Apache-tomcat , JAVA
HDD – Min 5 GB, Recommended 10 GB
RAM – Min 2 GB, Recommended 4 GB
Processor - Pentium Dual Xenon Processor

DE-3: The eBanking web application will operate with the following Web Browsers: FireFox, Chrome, Microsoft Internet Explorer version 5.0, 6.0. 7.0.



[eRail – Railway Reservation System Architecture]

Development Tools and Technologies

DT-1: JSP

JavaServer Pages (JSP) is a technology that helps software developers create dynamically generated web pages based on HTML, XML, or other document types. Released in 1999 by Sun Microsystems,[1] JSP is similar to PHP, but it uses the Java programming language.

To deploy and run JavaServer Pages, a compatible web server with a servlet container, such as Apache Tomcat or Jetty, is required. Architecturally, JSP may be viewed as a high-level abstraction of Java servlets. JSPs are translated into servlets at runtime; each JSP's servlet is cached and re-used until the original JSP is modified.[2]

JSP can be used independently or as the view component of a server-side model–view–controller design, normally with JavaBeans as the model and Java servlets (or a framework such as Apache Struts) as the controller.

JSP allows Java code and certain pre-defined actions to be interleaved with static web markup content, with the resulting page being compiled and executed on the server to deliver a document. The compiled pages, as well as any dependent Java libraries, use Java bytecode rather than a native software format. Like any other Java program, they must be executed within a Java virtual machine (JVM) that integrates with the server's host operating system to provide an abstract platform-neutral environment.

JSPs are usually used to deliver HTML and XML documents, but through the use of OutputStream, they can deliver other types of data as well.[4]

The Web container creates JSP implicit objects like pageContext, servletContext, session, request & response.

Features of JSP

- The Sun Microsystems's java server pages technology allows you to rapidly develop and easily maintain rich, dynamic web pages. As a part of java family JSP enables development of web based applications that are platform independent. The web applications build using JSP technology works with a wide variety of web servers, application servers, browsers and development tools. The logic that generates the content is encapsulated in tags and JavaBeans components and tied together in scriptlets, all of which are executed on the server side. If the core logic is encapsulated in tags and Beans then other individuals, such as web masters and page designers, can edit and work with JSP pages without affecting the generation of the content. Thus the JSP technology separates the user interface from the content generation.

- JSP page is simply an HTML web page, which contain additional bits of code that generates dynamic content of the page. JSP technology is a part of java family. It uses a java programming language based scripting language and JSP are compiled into java servelets the first time they are invoked. JSP pages may call JavaBeans, EJB components, RMI objects, DBC objects to perform processing on the server. Example JSP page may contain HTML that display static text and graphics, as well as a method call to JDBC object that access database, when the page is displayed in a user's browser.

Advantages of JSP

1. JSP technology follows the write once run anywhere rule which is the basic of the java language
2. JSP uses pure java and takes the advantage of its object oriented nature.
3. JSP uses a combination of tags and scripting to create dynamic web pages.
4. The JSP page uses the components like EJB, JavaBeans which are reusable. This gives the JSP reusability capabilities.
5. Applications made using JSP technology are easier to maintain..

DT-5: MySQL

MySQL is a relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases. The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL is owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. Free-software projects that require a full-featured database management system often use MySQL. Such projects include (for example) WordPress, phpBB, Drupal and other software built on the LAMP software stack. MySQL is also used in many high-profile, large-scale World Wide Web products including Wikipedia, Google and Facebook.

Features of MYSql are

- A broad subset of ANSI SQL 99, as well as extensions
- Cross-platform support
- Stored procedures
- Triggers
- Cursors
- Updatable Views
- True Varchar support
- INFORMATION_SCHEMA
- Strict mode
- X/Open XA distributed transaction processing (DTP) support; two phase commit as part of this, using Oracle's InnoDB engine
- Independent storage engines (MyISAM for read speed, InnoDB for transactions and referential integrity, MySQL Archive for storing historical data in little space)
- Transactions with the InnoDB, BDB and Cluster storage engines; savepoints with InnoDB

- SSL support
- Query caching
- Sub-SELECTs (i.e. nested SELECTs)
- Replication support (i.e. Master-Master Replication & Master-Slave Replication) with one master per slave, many slaves per master, no automatic support for multiple masters per slave.
- Full-text indexing and searching using MyISAM engine
- Embedded database library
- Partial Unicode support (UTF-8 and UCS-2 encoded strings are limited to the BMP)
- Partial ACID compliance (full compliance only when using the non-default storage engines InnoDB, BDB and Cluster)
- Shared-nothing clustering through MySQL Cluster
- Hot backup (via mysqlhotcopy) under certain conditions

Development Environment

NetBeans 7.1.2

NetBeans is an integrated development environment (IDE) for developing primarily with Java, but also with other languages, in particular PHP, C/C++, and HTML5. It is also an application platform framework for Java desktop applications and others.
The NetBeans IDE is written in Java and can run on Windows, OS X, Linux, Solaris and other platforms supporting a compatible JVM.
The NetBeans Platform allows applications to be developed from a set of modular software components called modules. Applications based on the NetBeans Platform (including the NetBeans IDE itself) can be extended by third party developers.[2]
The NetBeans Team actively support the product and seek feature suggestions from the wider community. Every release is preceded by a time for Community testing and feedback.
NetBeans IDE is an open-source integrated development environment. NetBeans IDE supports development of all Java application types (Java SE (including JavaFX), Java ME, web, EJB and mobile applications) out of the box. Among other features are an Ant-based project system, Maven support, refactorings, version control (supporting CVS, Subversion, Mercurial and Clearcase).

SQLYOG

SQLyog is a GUI tool for the RDBMS MySQL. It is developed by Webyog, Inc. based out of Bangalore, India and Santa Clara, California. SQLyog is being used by more than 30,000 customers worldwide and has been downloaded more than 2,000,000 times. It is very easy to used and very simple.

Design Goals and Constraints

Performance

No more than 5-percent degradation in average query response is allowed while all concurrent users are using the system.

Processor utilization should not exceed 80 percent during all concurrent users are using the system.

Availability

Because the system is accessed by users of the bank and staff for customer query, and their should not be any single point of failure.

Reliability

Because of the need no single point failure, automatic failover will be required. In addition, existing disaster recovery and backup plans and procedures must be revised to incorporate the Railway Reservation System.

Scalability

Railway Reservation System an average load of 25 concurrent users after the system is fully operational, and expects that to grow by 5 percent each year for the next five years.

Security

For the sensitive member information, all users will need to log on the system with their user id and password.

Every resource in the system are defined by the role and privileged. System administrator assigned user role and privileged for their access rights.

Interoperability

In Version 1.0 of the Railway Reservation System, there are no requirements for interoperability with other systems.

Location

The Railway Reservation System is implemented in banks existing network.

Setup/Installation

Setup and installation must not interrupt the system user's daily tasks and work flow.

Use Case

Manage Users

Description
This function will enable administrator to modify user information.

Business Need
This function will enable system users to interact with Railway Reservation System catalog directly without the intervention of any other employees.

Priority
Medium

Manage Reservation

Description
This function allows user of Railway Reservation System to create new ticket reservation.

Business Need
This function will support the system users to create new reservation

Priority
High

Manage Cancellation

Description
This function enables the user to cancel ticket.

Business Need
This function enables user of Railway Reservation System to have enter PRN no and cancel ticket.

Priority
High

PRN Query

Description

This function allows system user query to database for ticket information.

Business Need

This function will allow user to retrieve the latest ticket. Information by providing PRN no

Priority

High

Use Case : Manage Users

Title: Manage Users
Abbreviated Title: Manage Users
Requirement ID: 21

Intent

Manage the user information; modify the contact details of a user.

Scenario Narrative

Administrator may want to modify the contact details of a user.

Assumptions/Preconditions

- System users have access rights to view user data.

Actors

- Administrator

Basic Course

- Use case begins when the actor decides to modify user information.
- System opens the user master information.
- Actor navigates the required information from.
- Actor press Edit button and make the necessary changes in the record.
- Actor press Save button to save the record in the user master catalog.
- Use case ends when the selected information is passed to a method of delivery.

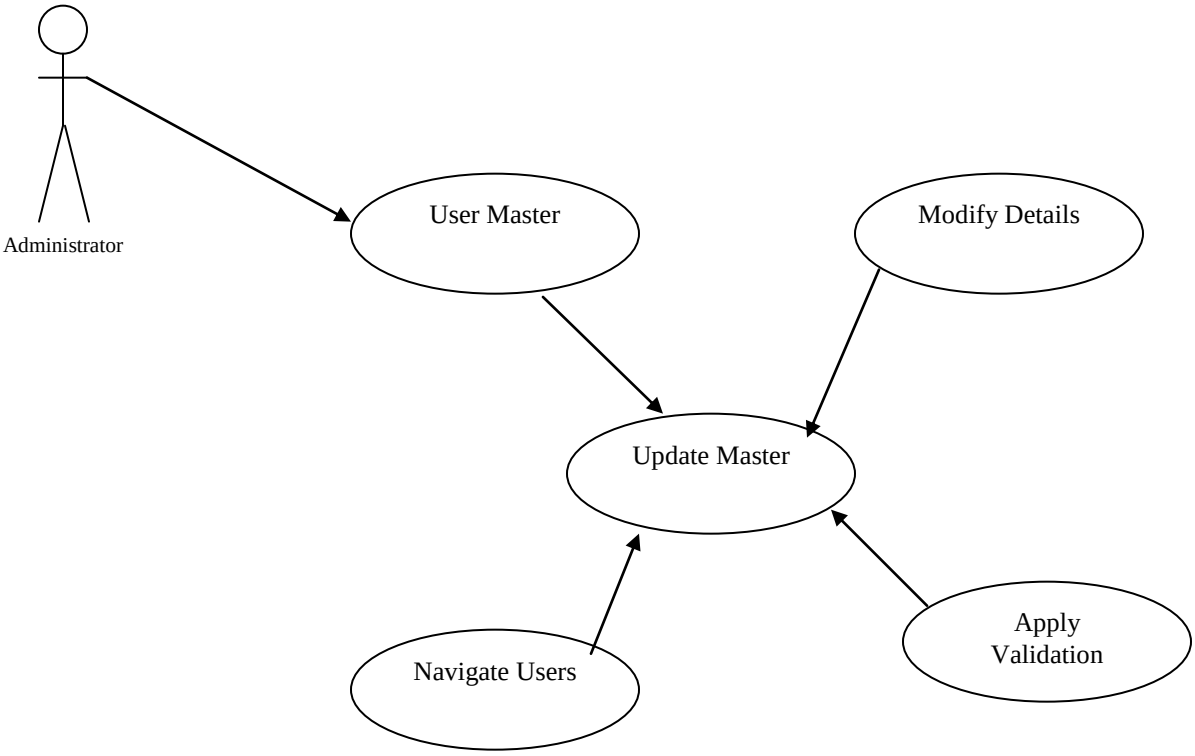
Alternate Course

- If no appropriate user information, system reports this fact.
- Use case restarts to enable users to update the type of user information.

Future Requirements

- The system users may want to apply filters to the retrieved data.
- The system users may want to sort the data. For example, the system user want to list the names of user in chronological order based on the entry date.

Use Case Model: Manage Users



Use Case Manage Reservation

Title: Manage Reservation
Abbreviated Title: Manage Reservation
Requirement ID: 13

Intent

Enable actor to create new reservation.

Scenario Narrative

Actors want to create new reservation

Assumptions/Preconditions

- The actor has rights to access to the Railway Reservation System, and having rights to make new reservation.

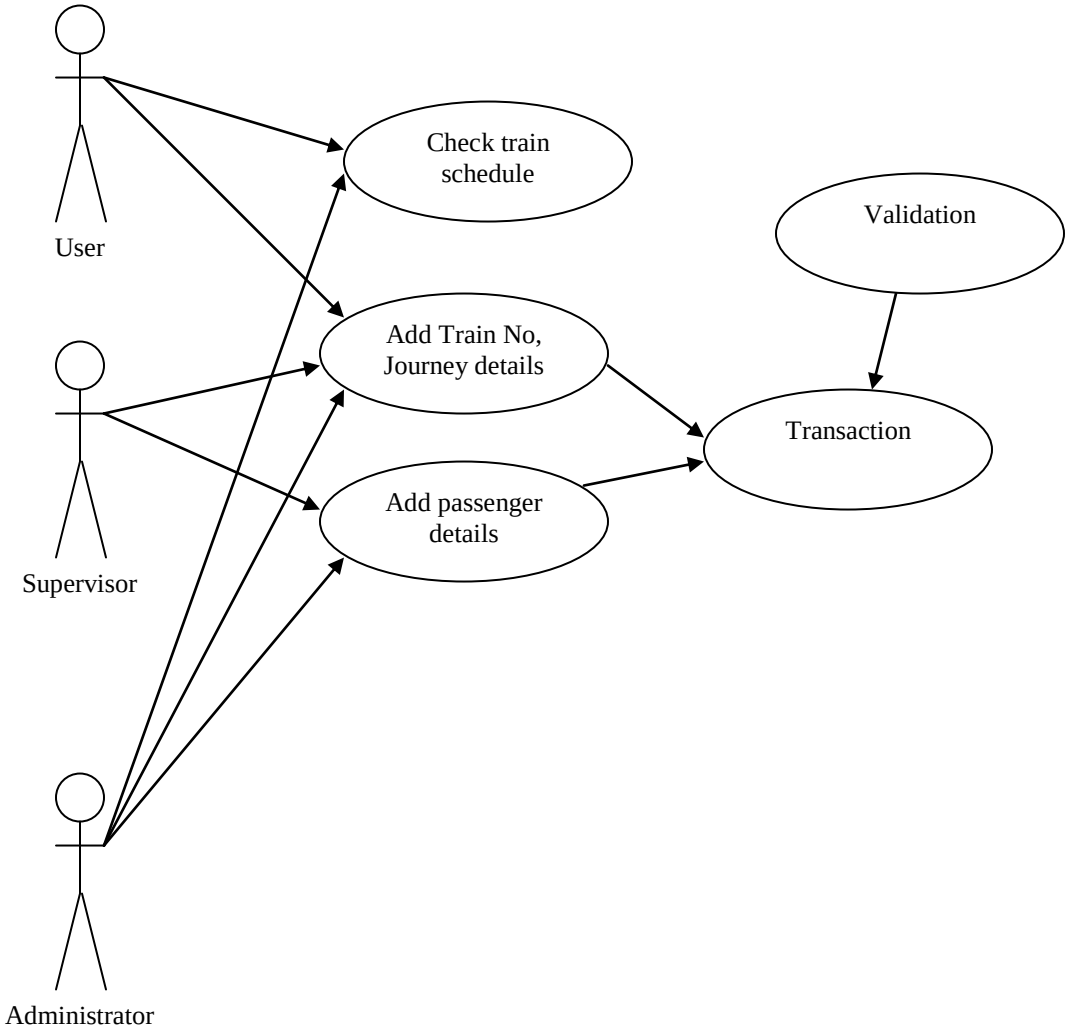
Actors

- User
- Supervisor
- Administrator

Basic Course:

- Use case begins when actor decides create new reservation.
- The system displays new reservation screen.
- Actor supply all the required details like train no, journey date, station code, passenger details.
- System validates all the information.
- System generates PRN no, new seat no and coach no, calculate ticket fare.
- System asks for user confirmation.
- Actor confirms the ticket.
- Use case ends when information is presented to the correct method of delivery.

Use Case Model: Manage Reservation



Use Case Manage Cancellation

Title: Manage Cancellation
Abbreviated Title: Manage Cancellation
Requirement ID: 16

Intent

Enable actor to cancel the ticket..

Scenario Narrative

An actor wants to cancel ticket.

Assumptions/Preconditions

- The actor has rights to access to the Railway Reservation System, and having rights to cancel ticket.

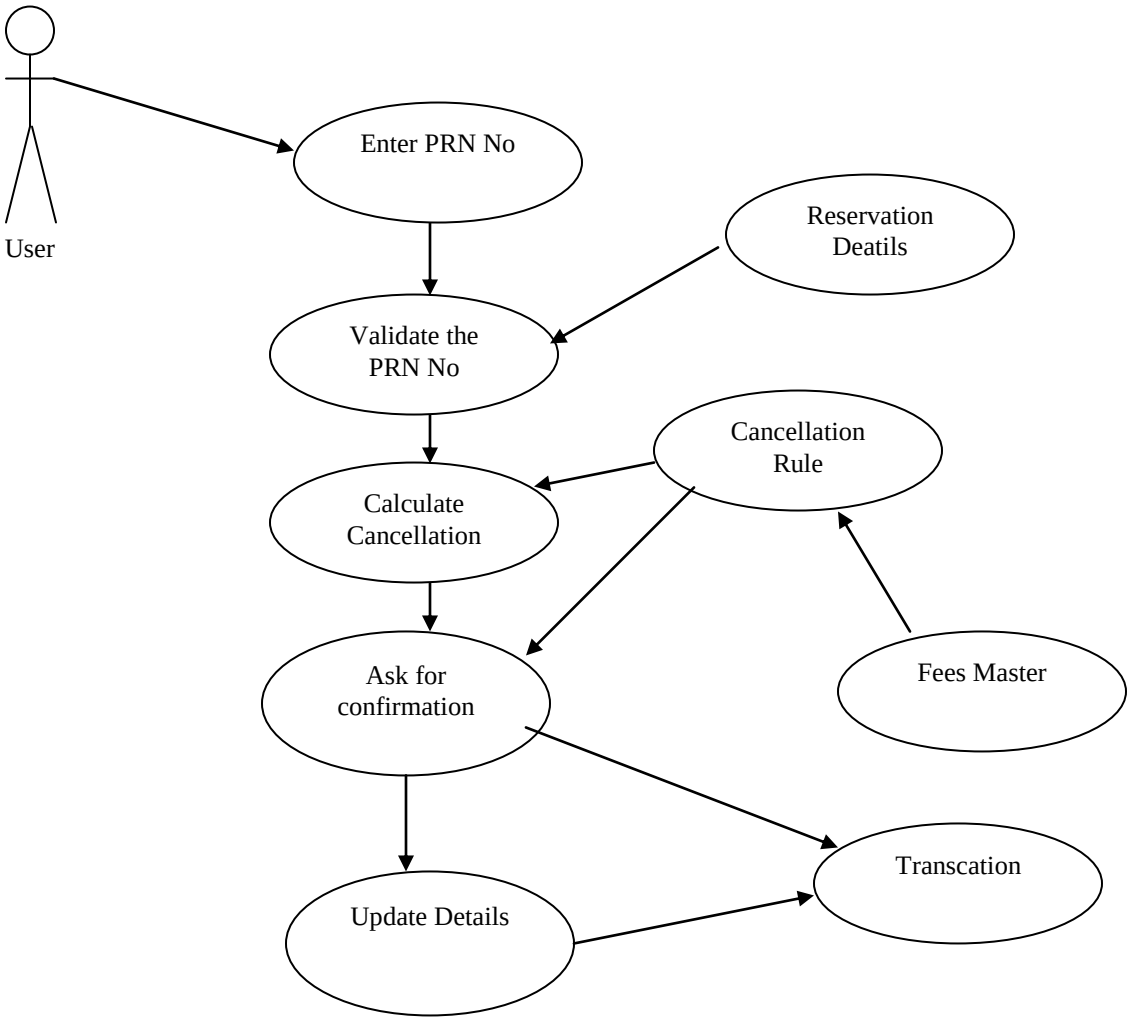
Actor

- User
- Supervisor
- Administrator

Basic Course:

- Use case begins when actor decides to cancel ticket.
- Actor enters PRN No.
- System validates PRN no.
- Systems displays reservation details, calculate cancellation fees.
- System asks for confirmation.
- Actor confirms cancellation.
- System update the database:
- Use case ends when information is presented to the correct method of delivery.

Use Case Model: Manage Cancellation



Use Case PRN Query

Title: PRN Query
Abbreviated Title: PRN Query
Requirement ID: 19

Intent

Enable actor to query the database for latest ticket information.

Scenario Narrative

An actor wants view the details of reservation by supplying PRN no.

Assumptions/Preconditions

- The actor has rights to access to the Railway Reservation System, and having rights to query the database for reservation details.

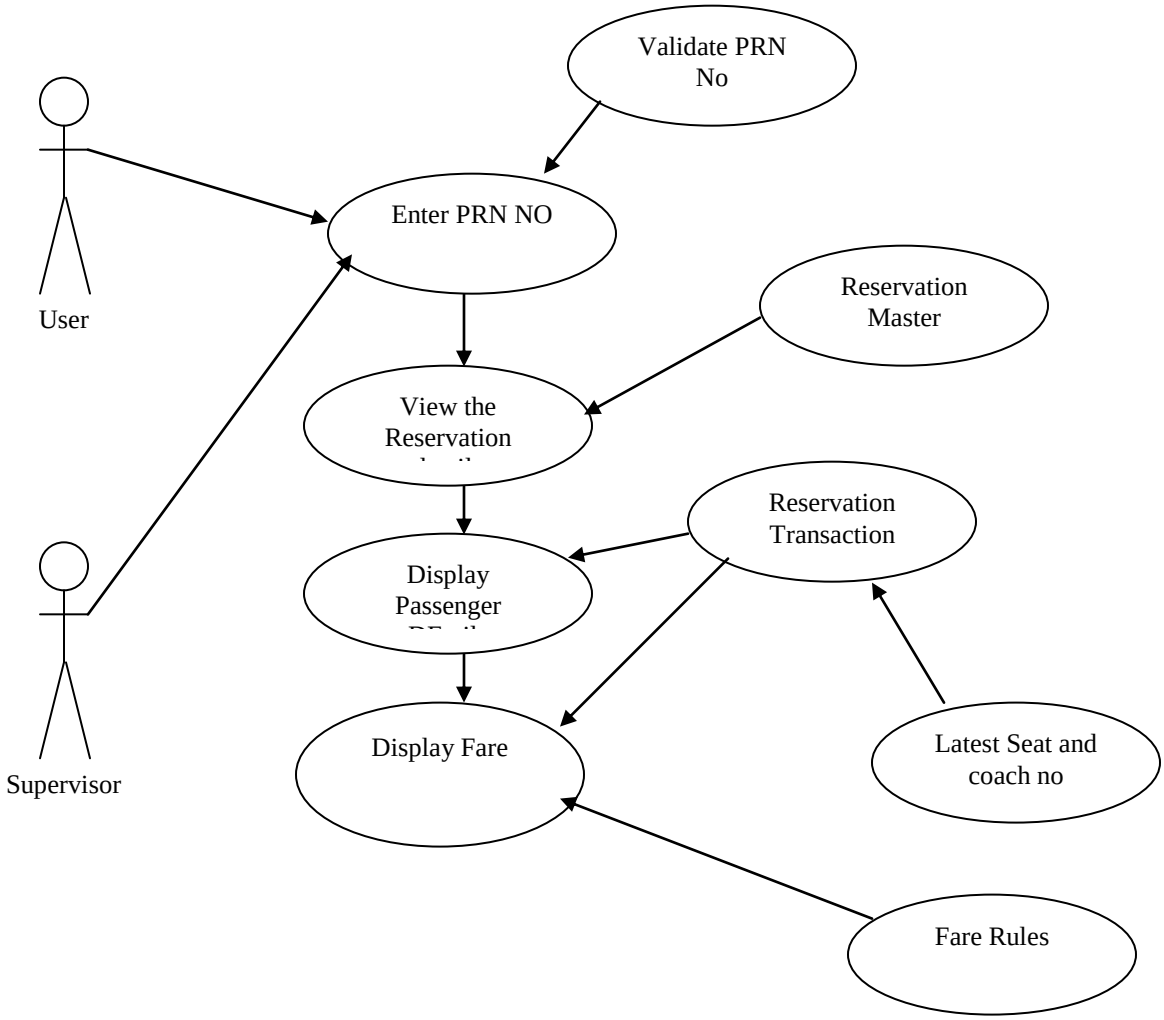
Actors

- User
- Supervisor

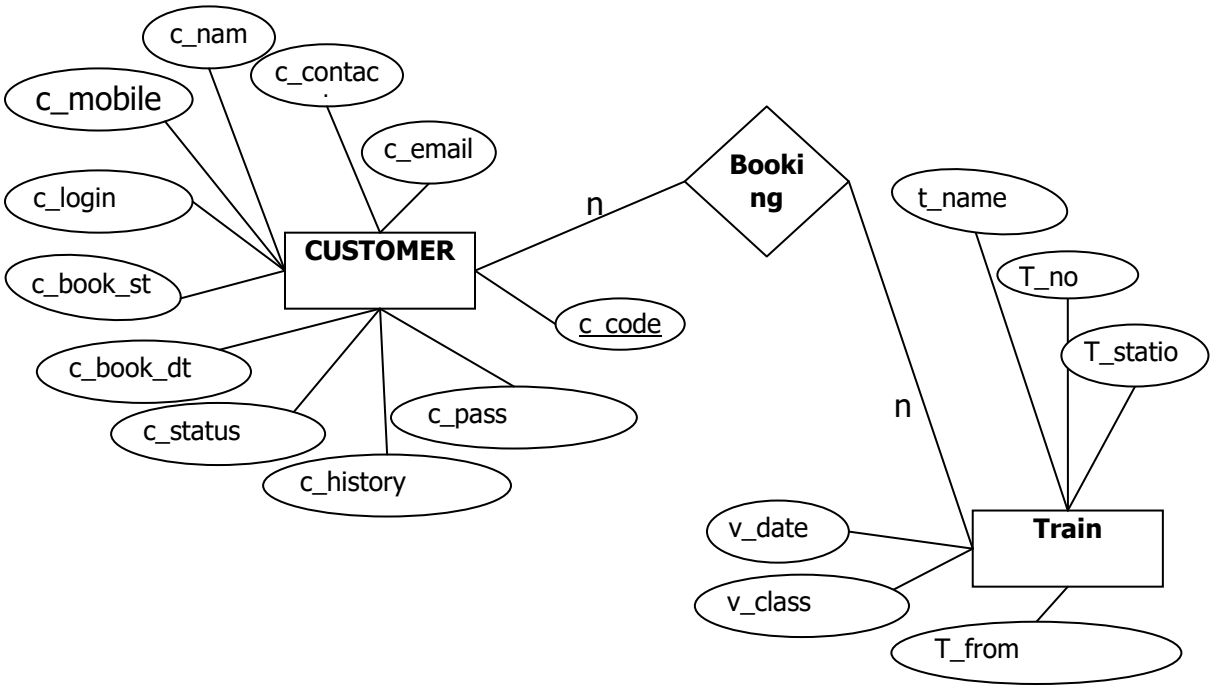
Basic Course:

- Use case begins when actor want to view the reservation details.
- Actor enters PRN no.
- System validates PRN no.
- Systems displays latest information related to reservation, seat no coach no..

Use Case: PRN Query



ER Diagram


c_nam
c_contac
c_mobile
c_email
c_login
CUSTOMER
c_book_st
c_code
c_book_dt
c_status
c_pass
c_history
n
Booki
ng
n
t_name
T_no
T_statio
v_date
Train
v_class
T_from

Railway Reservation System Data Dictionary

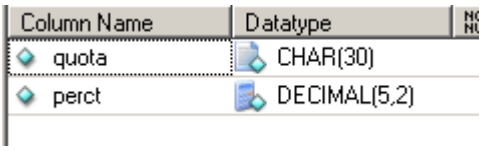
Table : cancel_info

Column Name	Datatype	NOT NULL	AUT INC
PNR	INT(10)		
coach_no	VARCHAR(4)		
seat_no	VARCHAR(4)		
name	CHAR(30)		
sex	CHAR(1)		
age	INT(3)		
quota	CHAR(30)		
amount	DECIMAL(9,2)		
status	VARCHAR(25)		
user_id	VARCHAR(8)		
cancel_date	DATE		

Table : credit

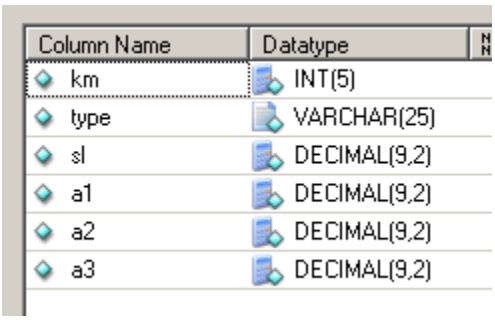
Column Name	Datatype
user_id	INT(8)
credit_no	VARCHAR(16)
amt	DECIMAL(8,2)

Table : discount



Column Name	Datatype
quota	CHAR(30)
perct	DECIMAL(5,2)

Table : fare



Column Name	Datatype
km	INT(5)
type	VARCHAR(25)
sl	DECIMAL(9,2)
a1	DECIMAL(9,2)
a2	DECIMAL(9,2)
a3	DECIMAL(9,2)

Table : feedback

Column Name	Datatype
emailid	VARCHAR(30)
feed	VARCHAR(200)

Table : login

Column Name	Datatype
user_id	INT(8)
email	VARCHAR(30)
uname	VARCHAR(30)
pass	VARCHAR(6)
author	VARCHAR(25)

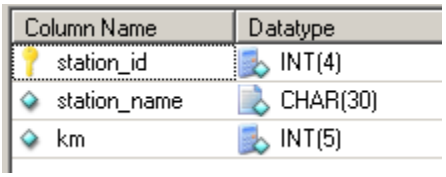
Table : passenger_info

Column Name	Datatype
PNR	INT(10)
coach_no	VARCHAR(4)
seat_no	VARCHAR(4)
name	CHAR(30)
sex	CHAR(1)
age	INT(3)
quota	CHAR(30)
amount	DECIMAL(9,2)
status	VARCHAR(25)

Table : reg_user

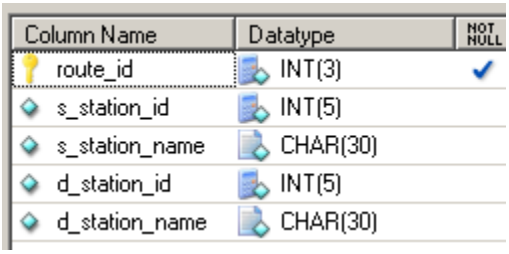
Column Name	Datatype	NOT NUL
user_id	INT(8)	✓
name	CHAR(30)	
sex	CHAR(1)	
dob	DATE	
phone_no	VARCHAR(13)	
email_id	VARCHAR(30)	
credit_no	VARCHAR(16)	
pass_wrd	VARCHAR(8)	
addr	VARCHAR(250)	
city	VARCHAR(30)	
state	CHAR(30)	
pincode	VARCHAR(6)	
country	VARCHAR(30)	

Table : route



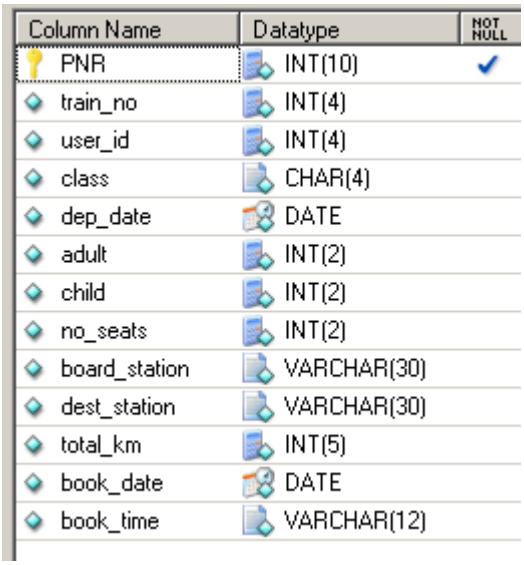
Column Name	Datatype
station_id	INT(4)
station_name	CHAR(30)
km	INT(5)

Table : route_main



Column Name	Datatype	NOT NULL
route_id	INT(3)	✓
s_station_id	INT(5)	
s_station_name	CHAR(30)	
d_station_id	INT(5)	
d_station_name	CHAR(30)	

Table : ticket_book



Column Name	Datatype	NOT NULL
PNR	INT(10)	✓
train_no	INT(4)	
user_id	INT(4)	
class	CHAR(4)	
dep_date	DATE	
adult	INT(2)	
child	INT(2)	
no_seats	INT(2)	
board_station	VARCHAR(30)	
dest_station	VARCHAR(30)	
total_km	INT(5)	
book_date	DATE	
book_time	VARCHAR(12)	

Table : train_info

Column Name	Datatype	NOT NULL
train_no	INT(4)	✔
train_name	VARCHAR(30)	
type	VARCHAR(30)	
s_station_id	INT(4)	
d_station_id	INT(4)	
distance	INT(5)	
sl	INT(2)	
a1	INT(2)	
a2	INT(2)	
a3	INT(2)	
mon	CHAR(1)	
tue	CHAR(1)	
wed	CHAR(1)	
thu	CHAR(1)	
fri	CHAR(1)	
sat	CHAR(1)	
sun	CHAR(1)	

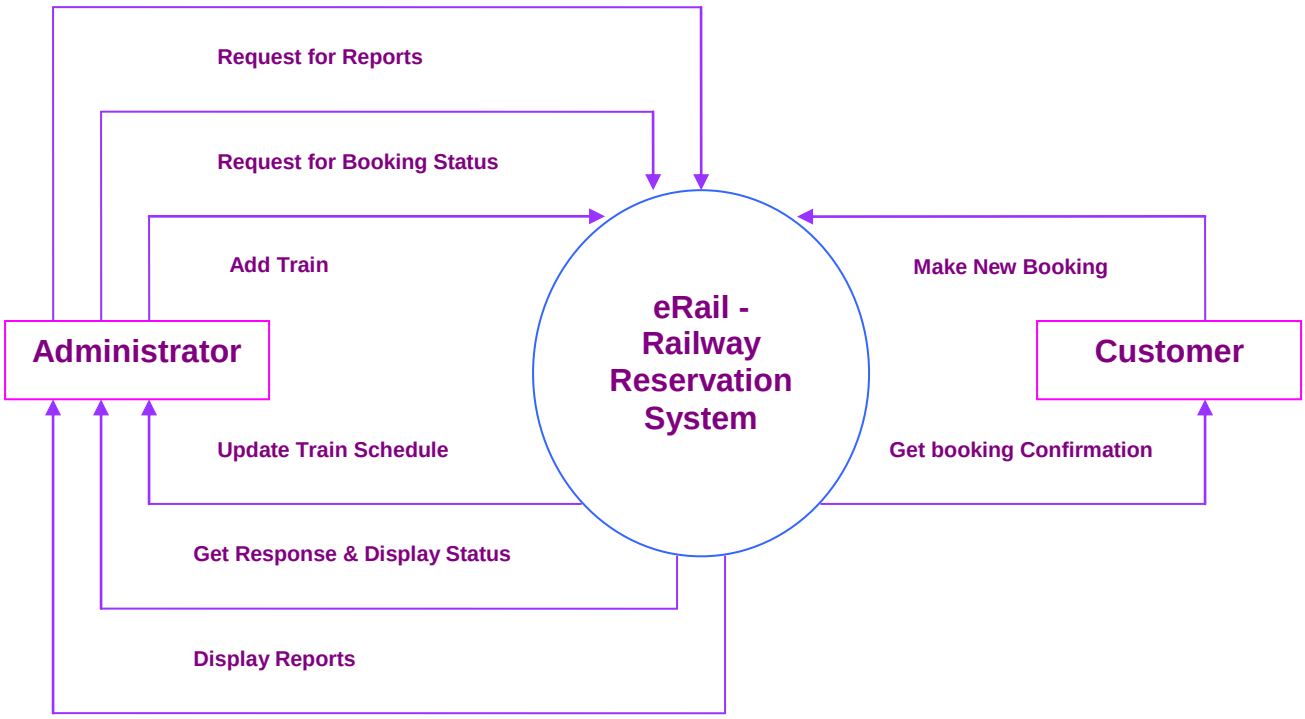
Railway Reservation System DFD (Data Flow Diagram)

A data-flow diagram (DFD) is a graphical representation of the "flow" of data through an information system. DFDs can also be used for the visualization of data processing (structured design). On a DFD, data items flow from an external data source or an internal data store to an internal data store or an external data sink, via an internal process.

11.1 Event Table

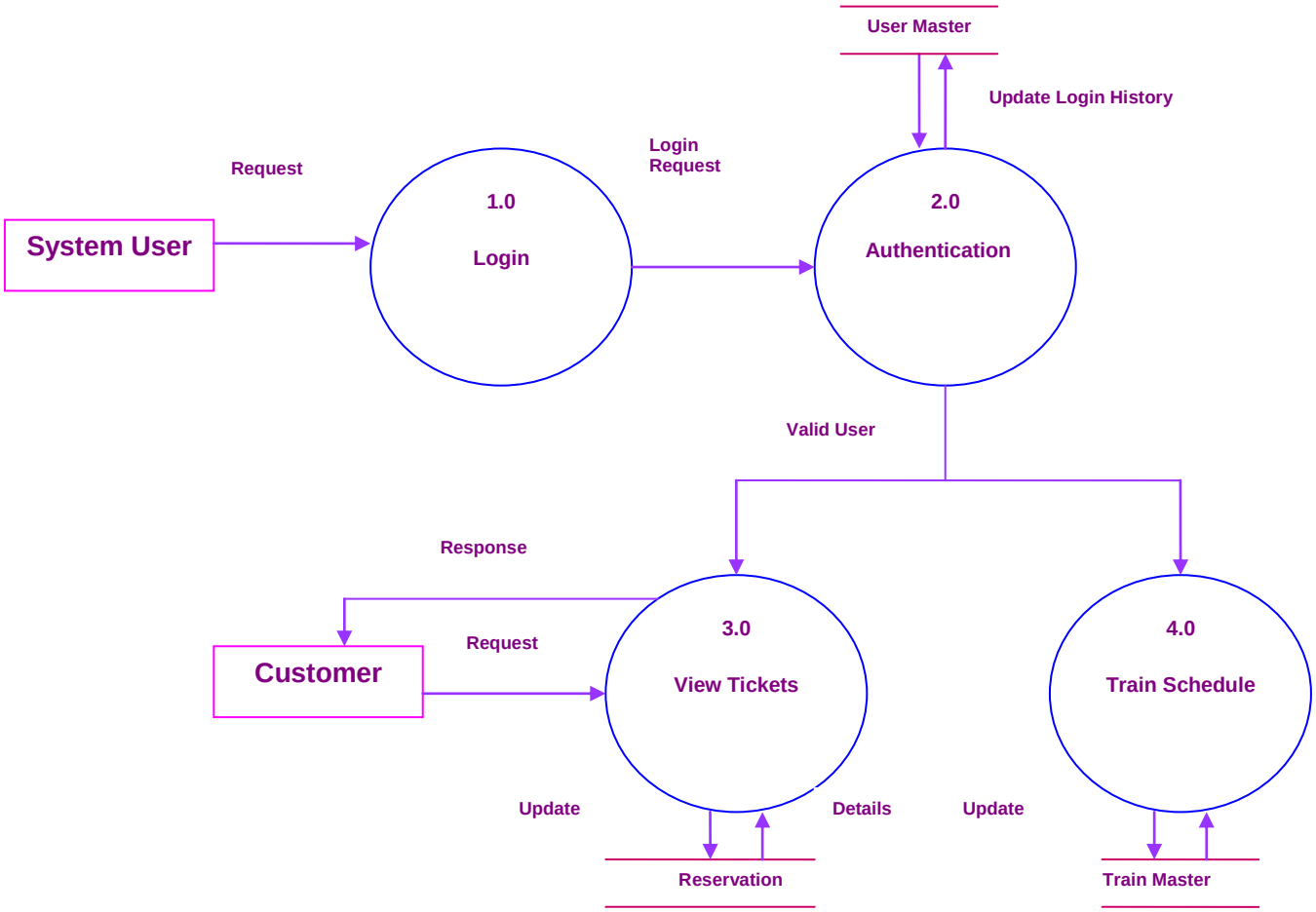
Event	Trigger	Source	Response	Destination
Customer want to view booking status	View Order Status	Customer	Display Booking	Customer
Customer wants to View Train Schedule	View Schedule	System User	View Schedule	System User
Add Train	Add Train	System User	Train details saved	System User

11.2 Context Level



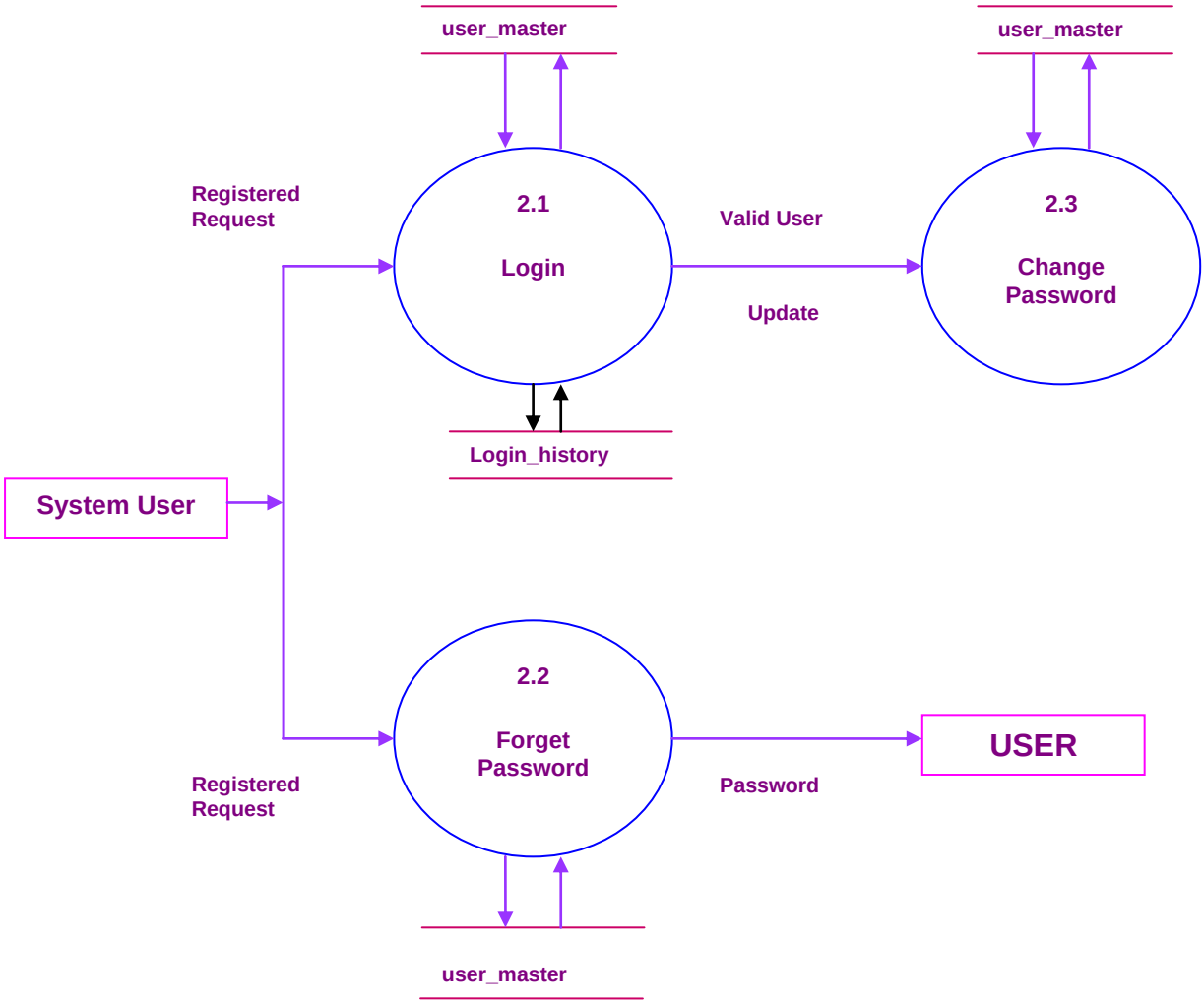
This context-level data flow diagram first, which shows the interaction between the system and external agents which act as data sources and data sinks. On the context diagram (also known as the Level 0 DFD) the system's interactions with the outside world are modelled purely in terms of data flows across the system boundary. This context diagram shows the entire Railway Reservation system as a single process,

11.2 Level 1 (High Level Diagram)

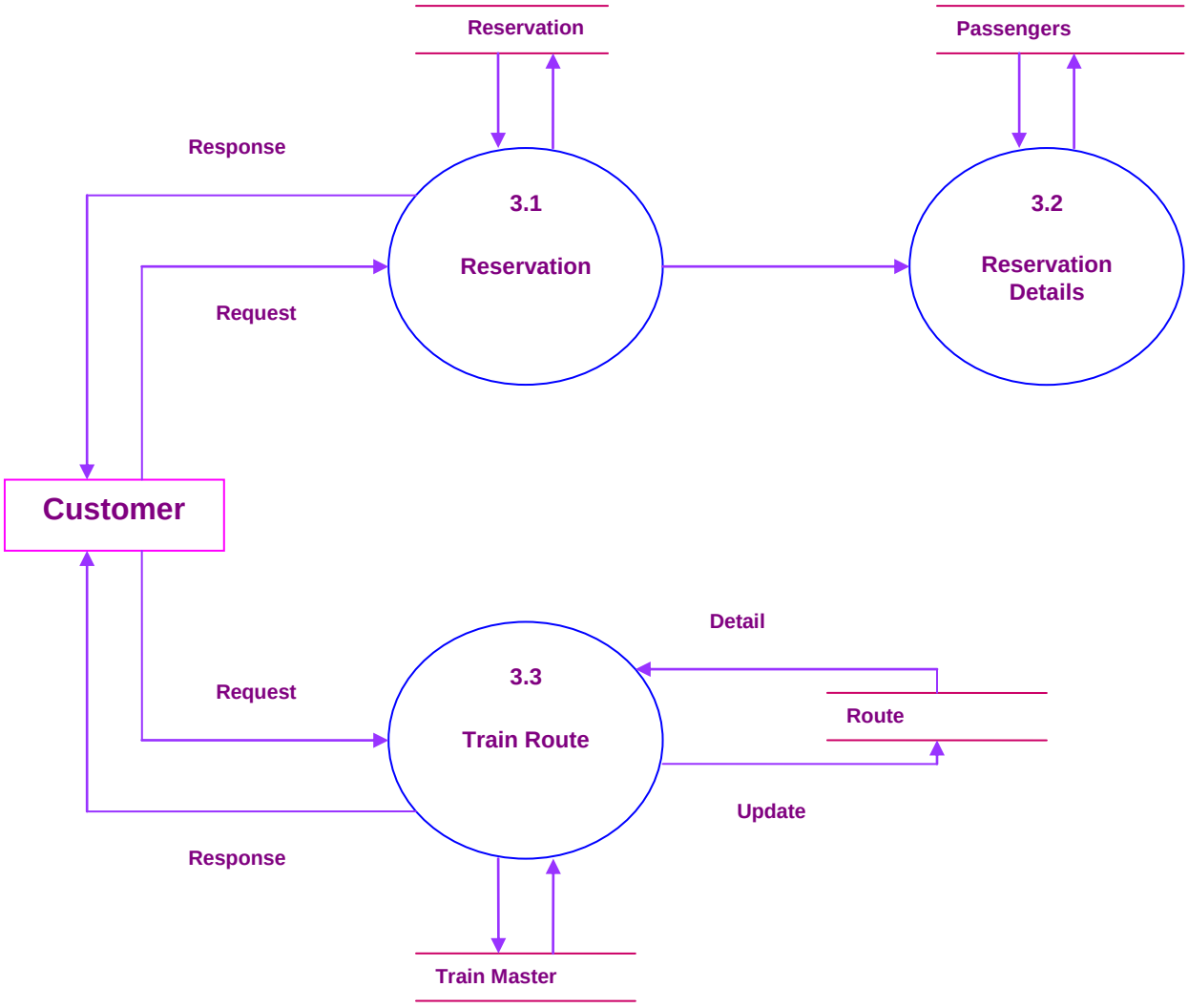


This level (level 1) shows all processes at the first level of numbering, data stores, external entities and the data flows between them. The purpose of this level is to show the major high-level processes of the eRail system and their interrelation. A level-1 diagram must be balanced with its parent context level diagram, i.e. there must be the same external entities and the same data flows, these can be broken down to more detail in the level 1.

11.3 DFD Level 1 Diagram (Login Authentication)



11.4 DFD Level – 3 View Booking



Project Planning and Scheduling

Planning

Planning is very important in every aspect of development work. Software project plan indicated scope of the project, milestones and deliverables, project estimates, resource allocation, risk management, scheduling techniques and quality control and standard. Software project plan can be viewed as the following:

User Interfaces

The use of Textbox and List box for accepting data. The input data are then stored in the database. These data can also be retrieved from the database and displayed in the form of tables.

Hardware Interfaces

Raw data inserted into this software are permanently stored in tables; hence processor having free space will be useful for faster storage and retrieval of data. Here we have used 3.6 GHz P4 processor, which will have an additional support for our software.

Software Interfaces

This software is operated in a WINDOWS XP environment. This will help for firewall security provisions if the software is used along with internet connection.

Cost of Implementation

This project can be implemented in the organization in one to two weeks. The cost of this project is derived from effort, hardware cost, travel expenses, training cost, telecommunication costs etc.

Effort:

It includes the total number of manpower per months. As this project is completely computerized hence less number of manpower will be used to successfully run this project. At least 2-3 persons will be enough to maintain this project.

Hardware cost:

It includes 2 INTEL P4 Standalone Computers. Cost around 60,000.

Training Cost:

One Software personnel will be allotted for providing training to the manpower allotted

Project duration:

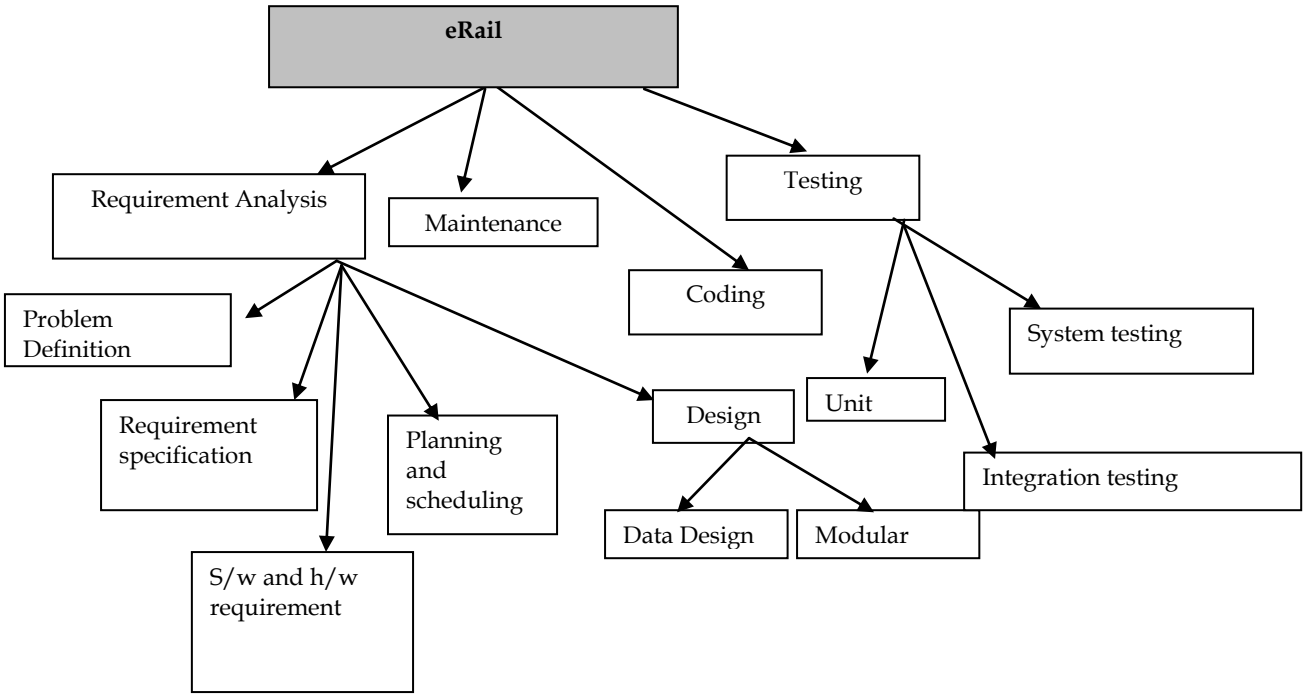
It will take complete 2 months for completion. After that it will take another 2-3 weeks for implementation and testing. Another 1-2 weeks is kept in hand for any inconvenience.

With respect to the customer:

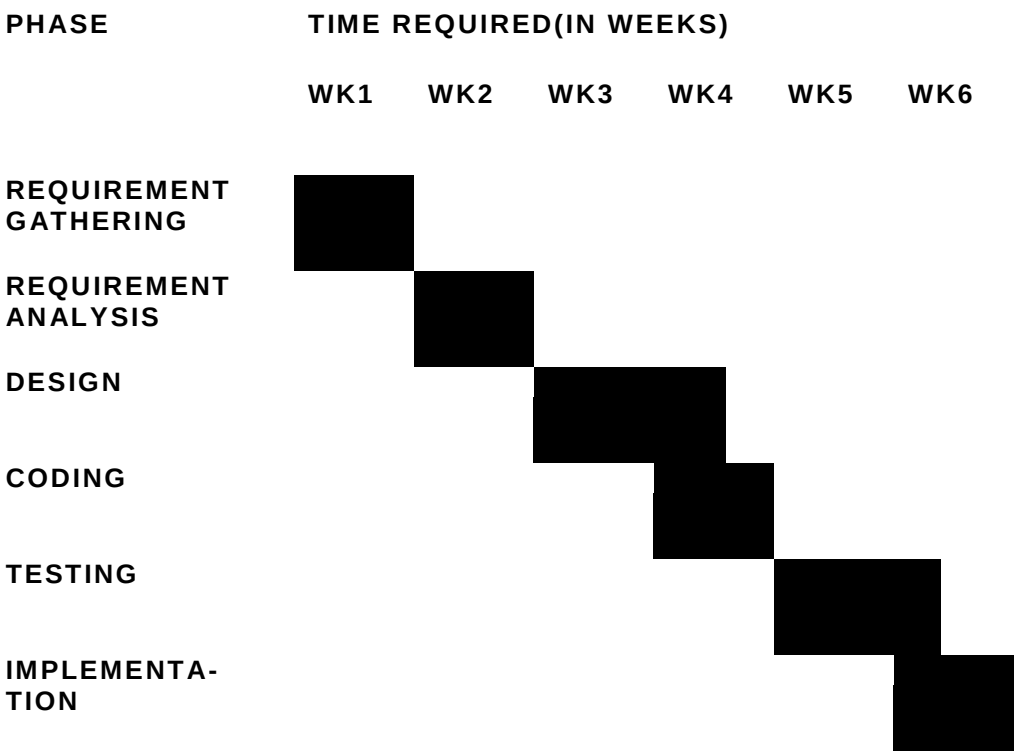
Weekly or timely meetings will be scheduled with the customers for getting time to time feedback. These meetings will be accompanied with presentation reports. After getting feedback further modifications and developments will be done.

Scheduling

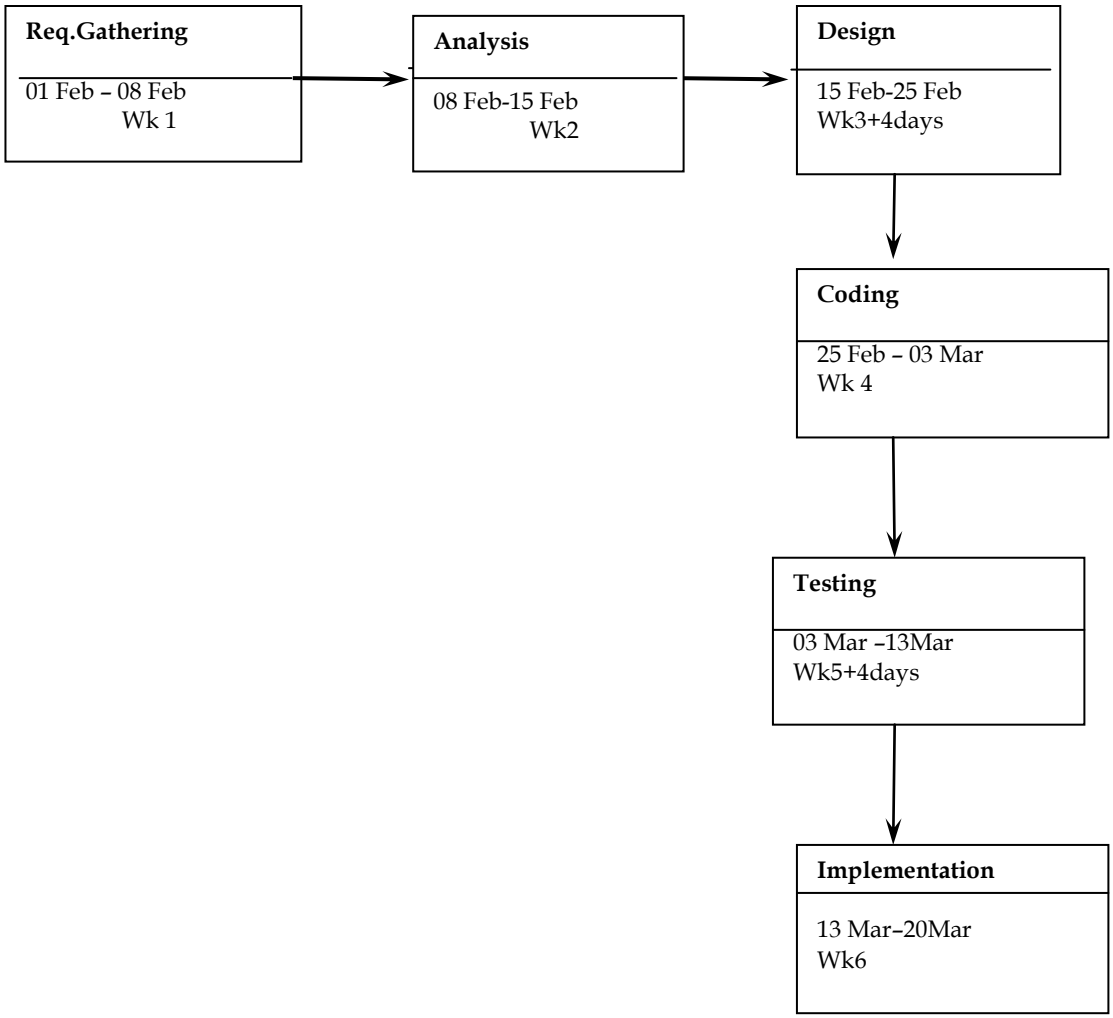
Scheduling of a project can be correlated to prioritizing various jobs with respect to their cost, time and duration. Scheduling can be done with resource constraint or time constraint in mind.



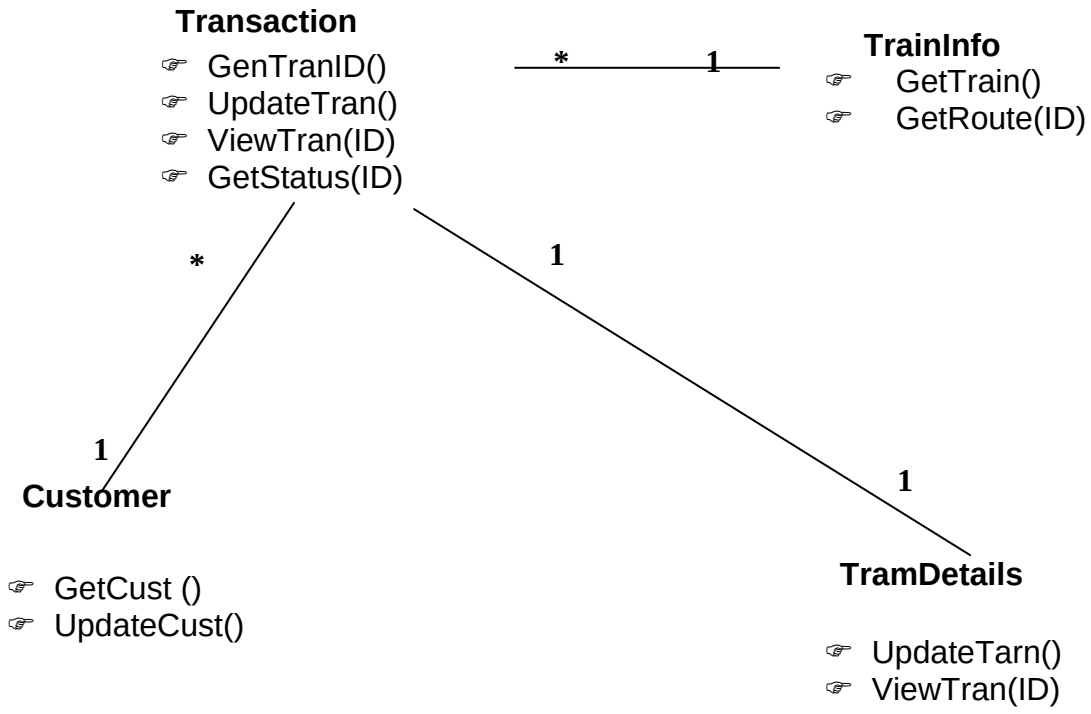
Gantt chart:


PHASE
TIME REQUIRED(IN WEEKS)
WK1
WK2
WK3
WK4
WK5
WK6
REQUIREMENT GATHERING
REQUIREMENT ANALYSIS
DESIGN
CODING
TESTING
IMPLEMENTA-TION

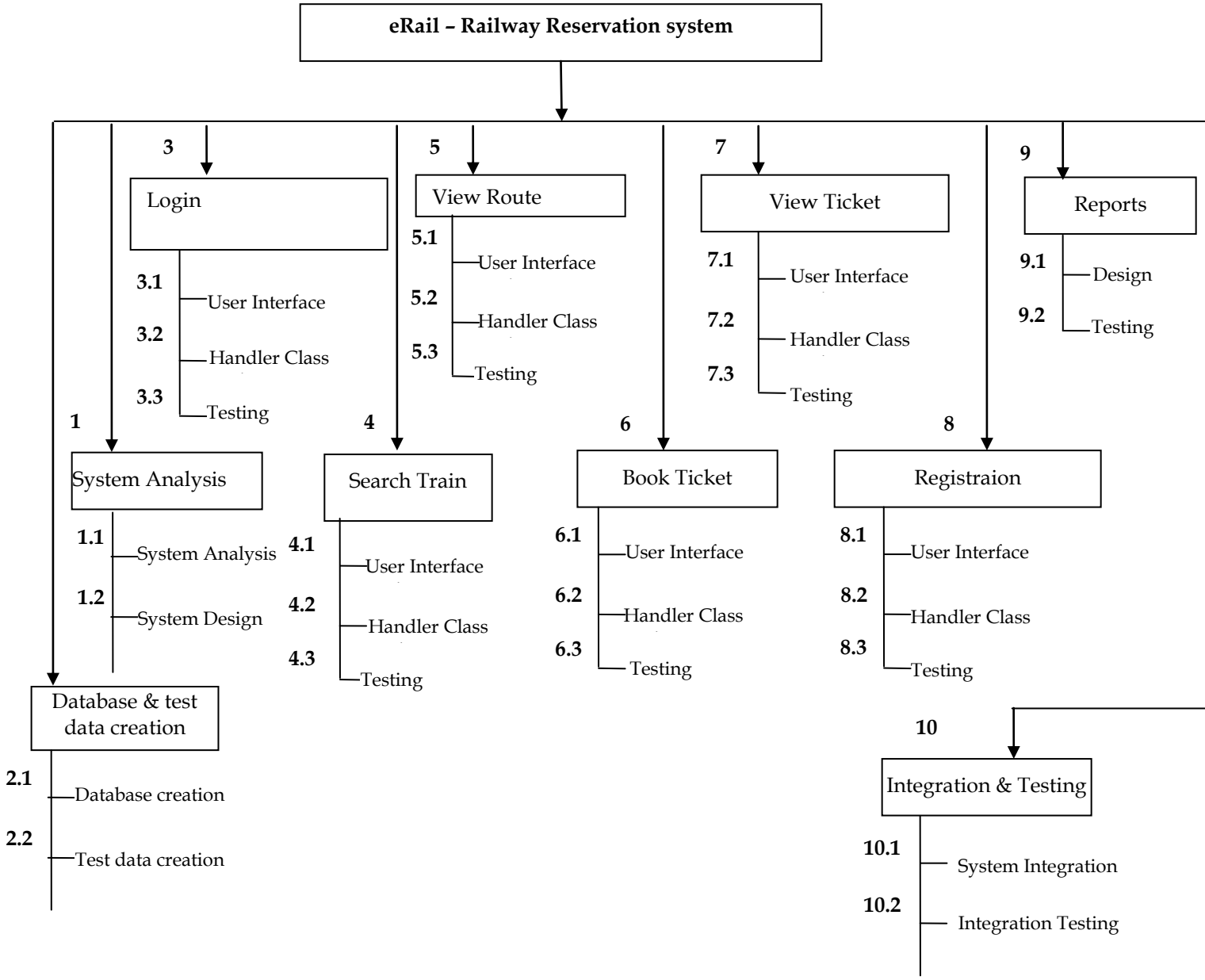
PERT chart:


Req.Gathering
01 Feb – 08 Feb
Wk 1
Analysis
08 Feb-15 Feb
Wk2
Design
15 Feb-25 Feb
Wk3+4days
Coding
25 Feb – 03 Mar
Wk 4
Testing
03 Mar –13Mar
Wk5+4days
Implementation
13 Mar–20Mar
Wk6

Class Diagram



12.11 WBS – Work Breakdown Structure of eRail

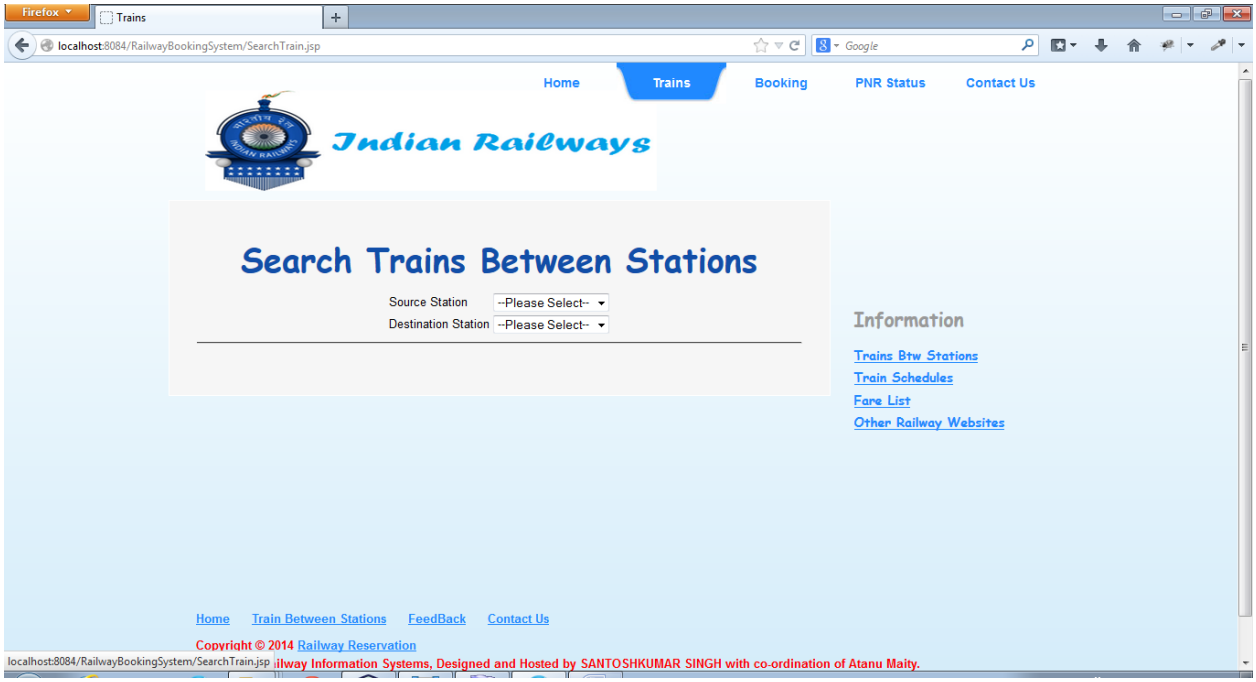


Work Breakdown Structure (WBS)

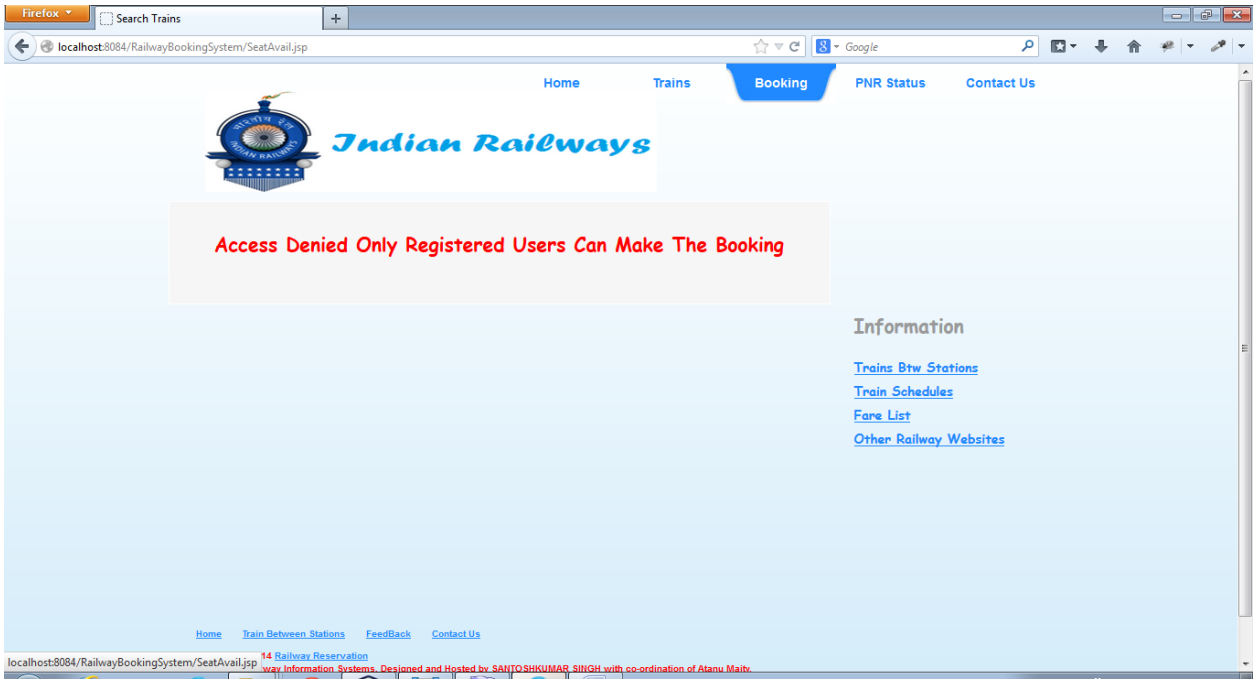
Interface

Railway Reservation System : Home Page

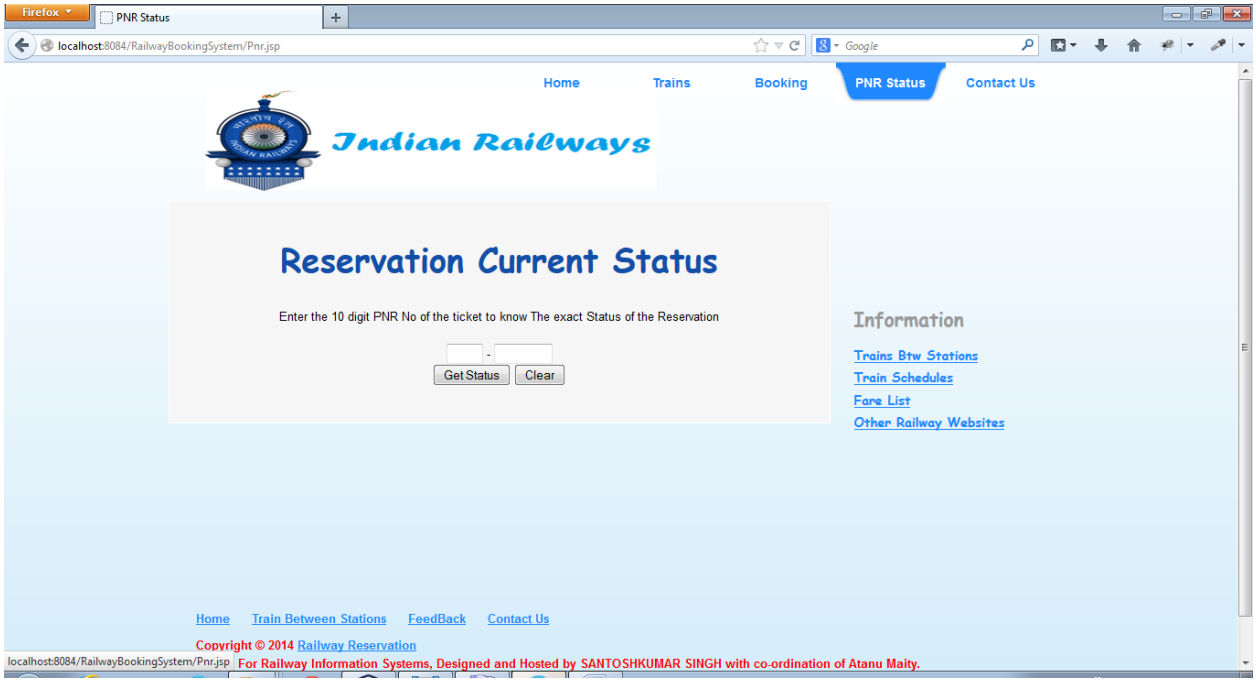
Railway Reservation System : Search Train



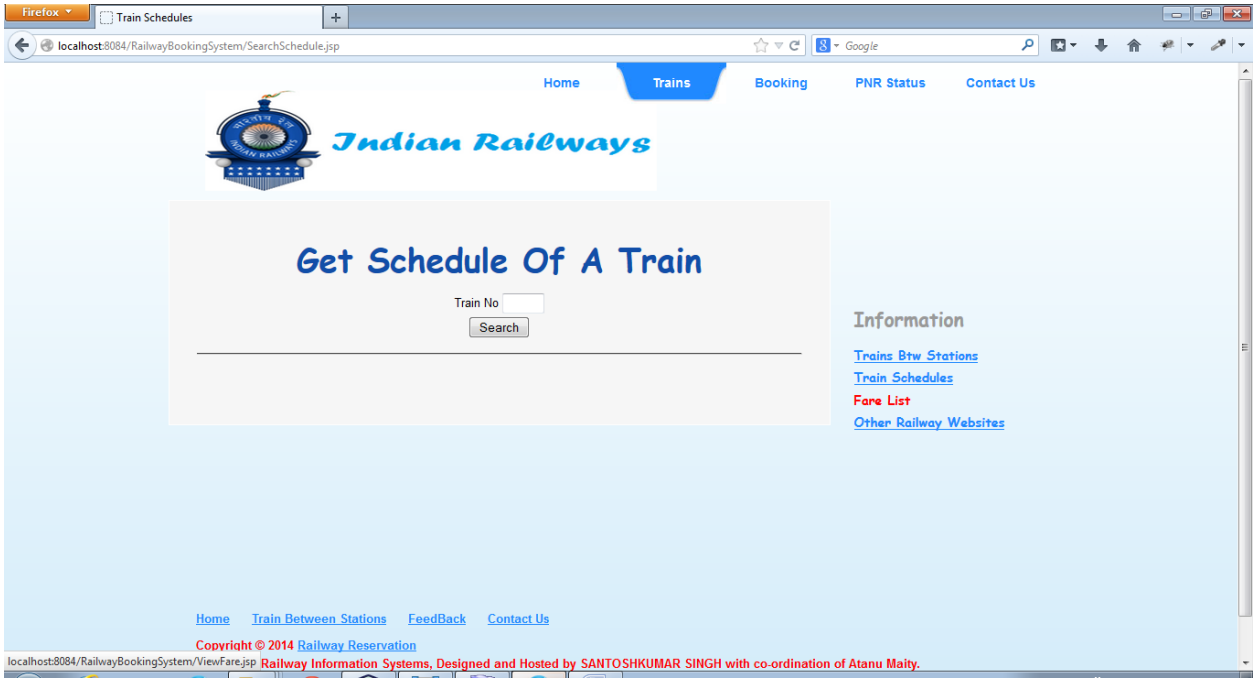
Railway Reservation System : User Access Denied



Railway Reservation System : Get the PRN

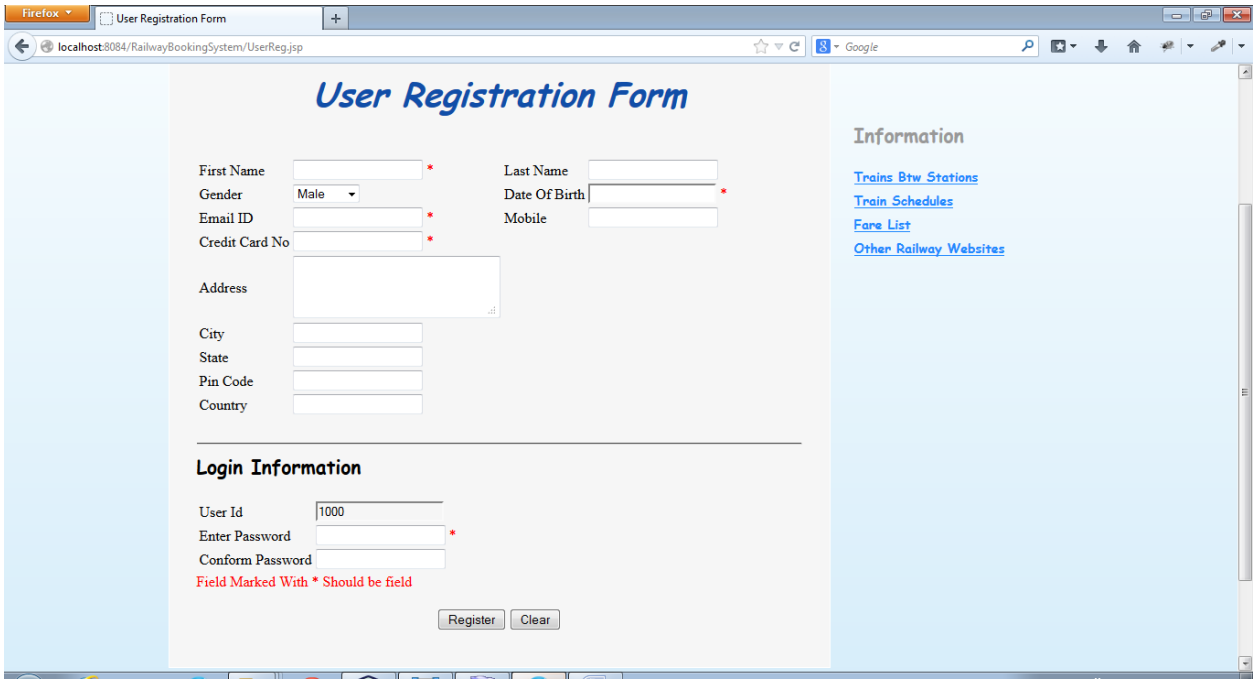


Railway Reservation System : Get Train Schedule

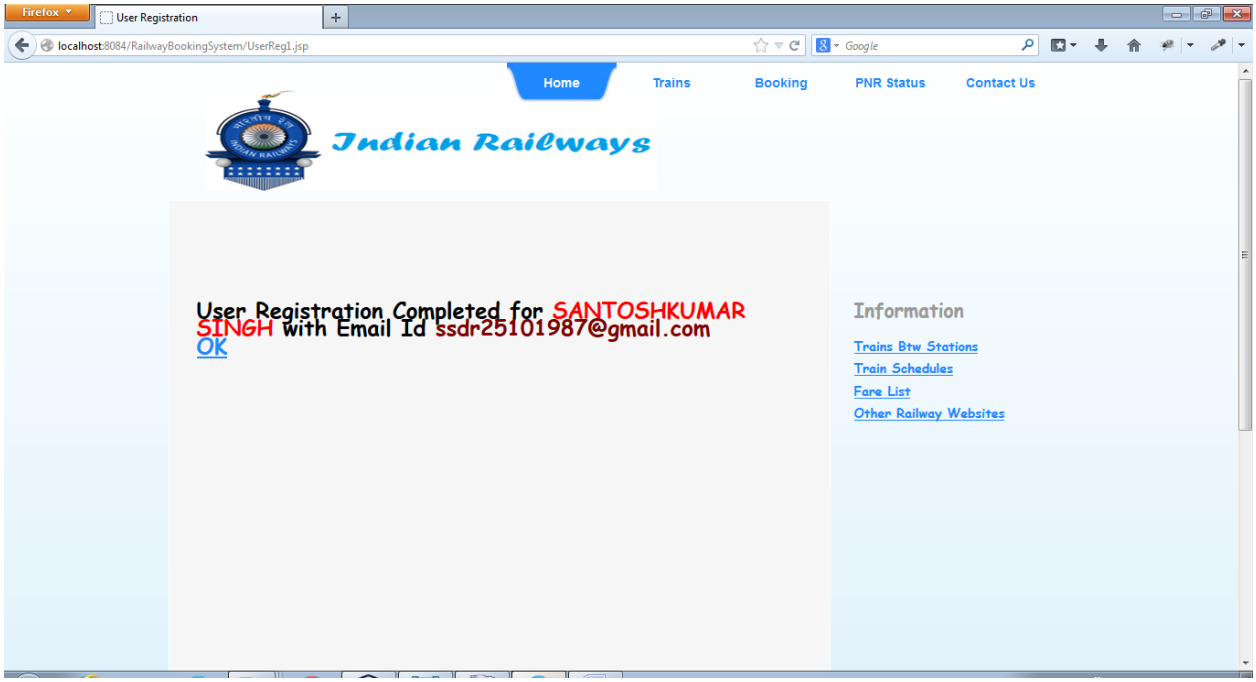


Railway Reservation System : Get Fare Chart

Railway Reservation System : User Registration Form

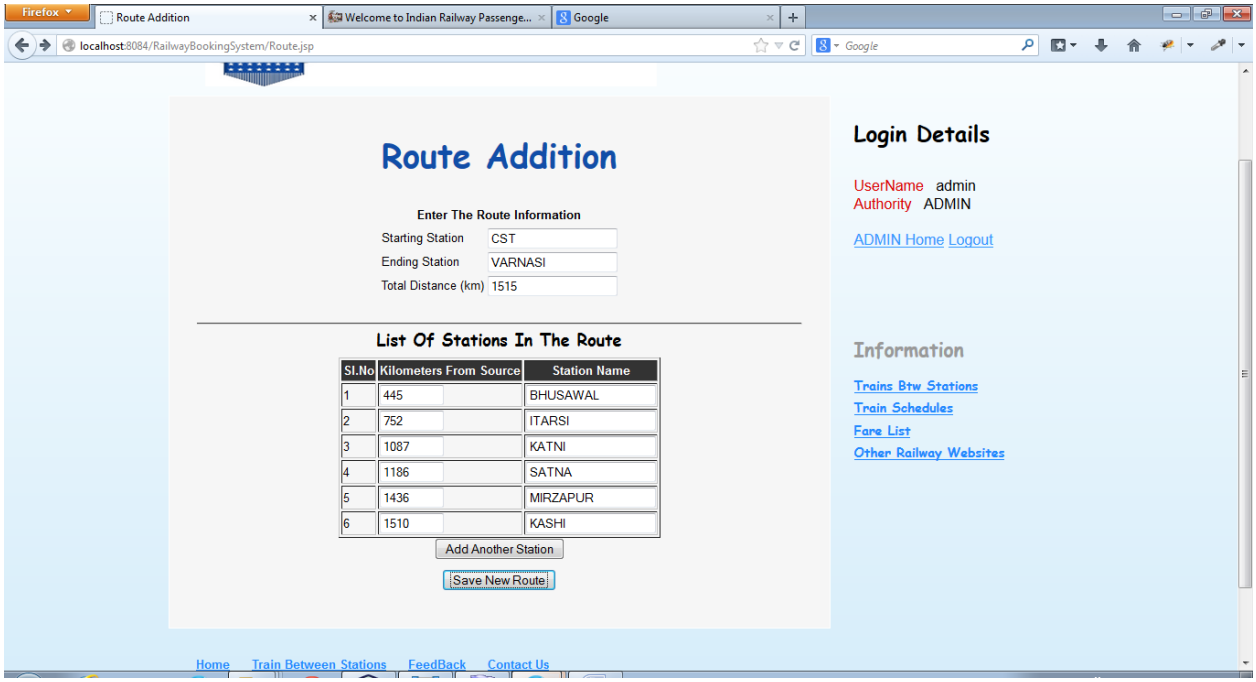


Railway Reservation System : User Home Page

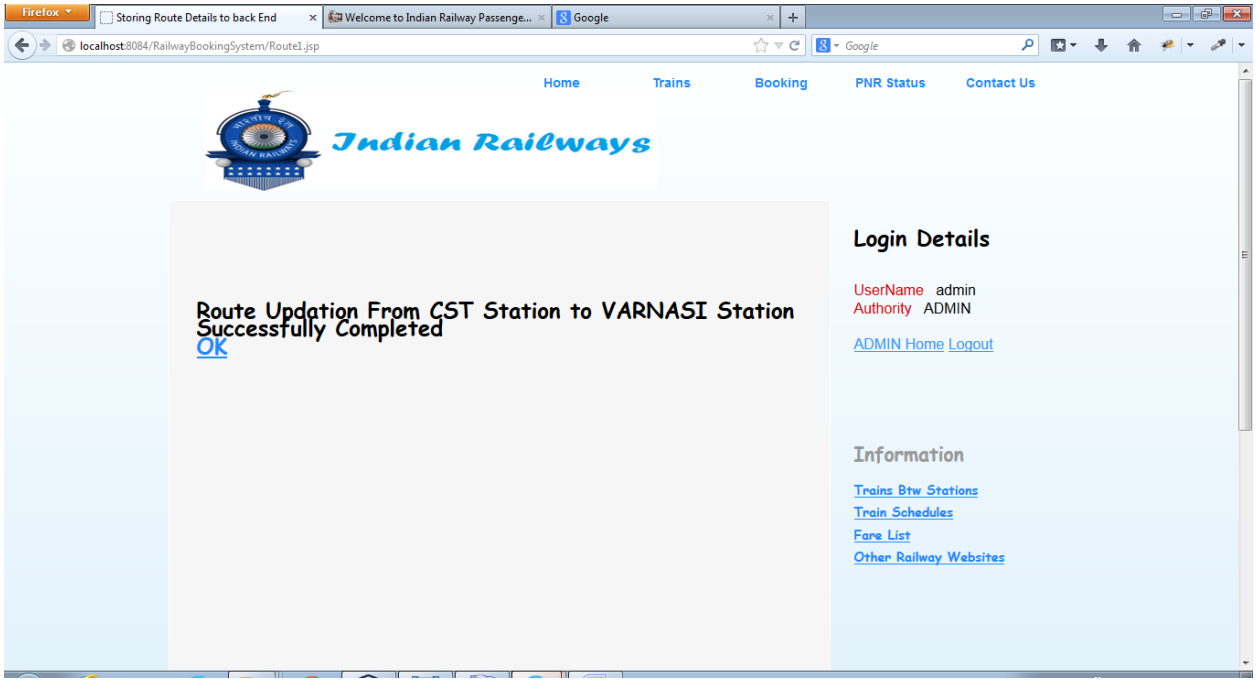


Railway Reservation System : Administrator

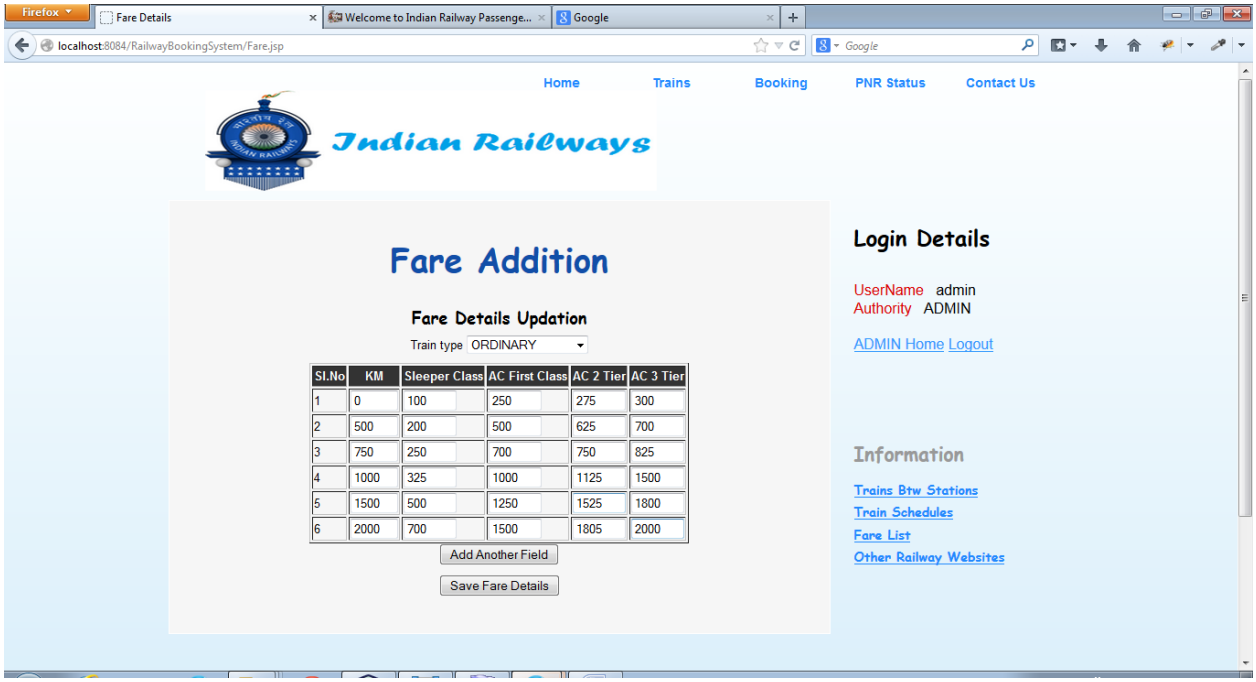
Railway Reservation System : Route Addition



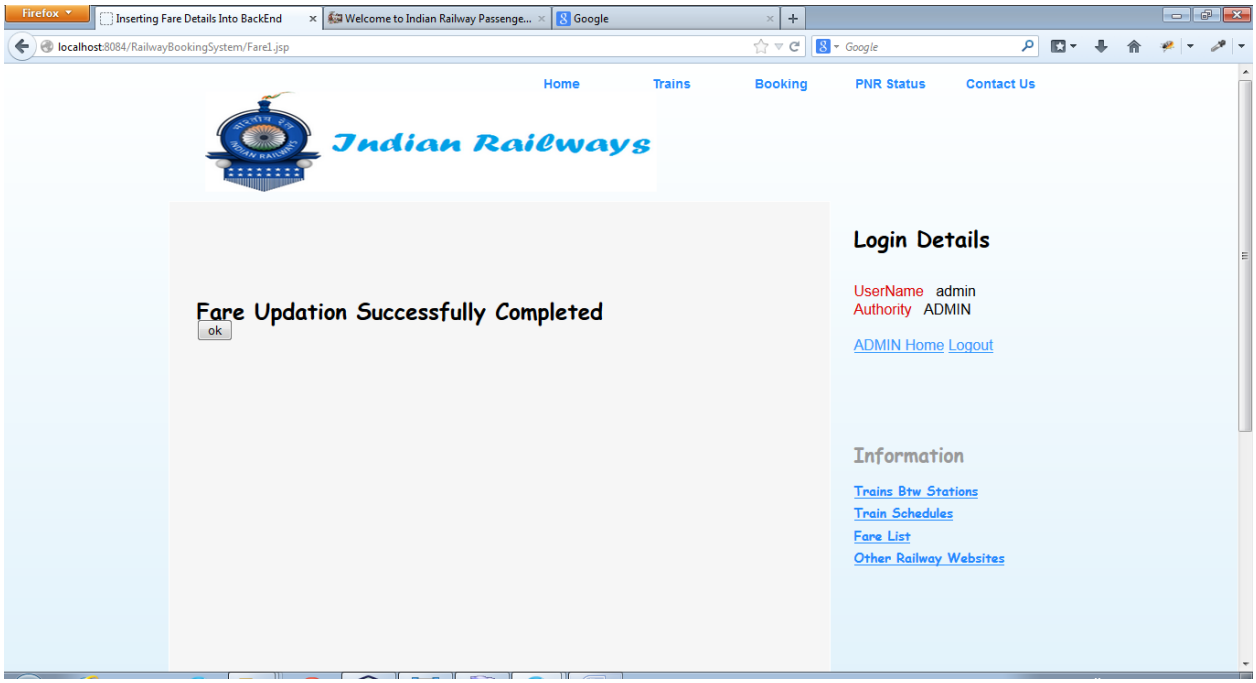
Railway Reservation System : Route Updation



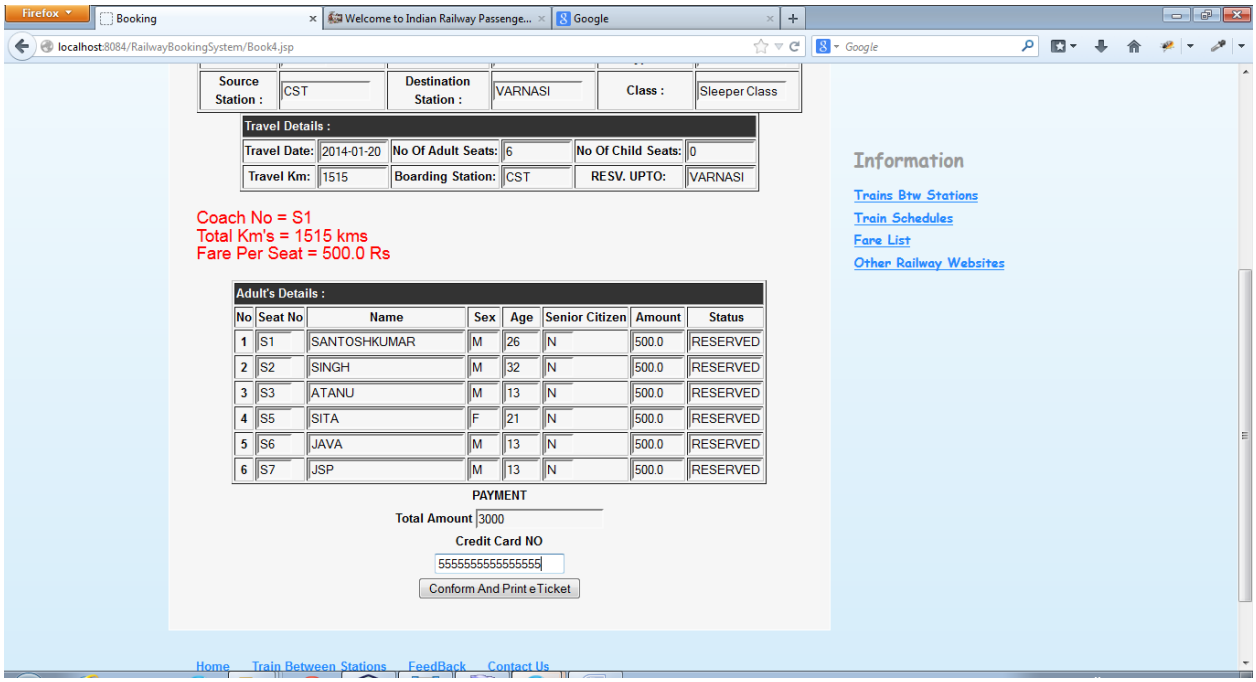
Railway Reservation System : Fare Addition



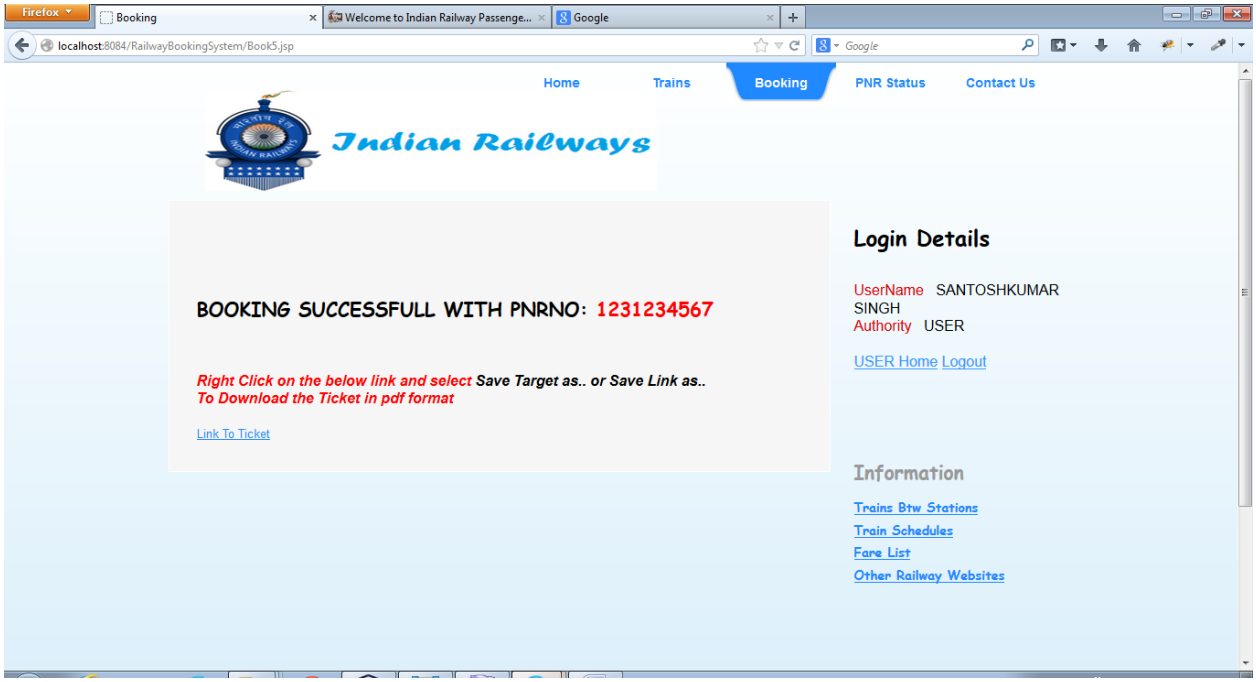
Railway Reservation System : Fare Updation Confirmation



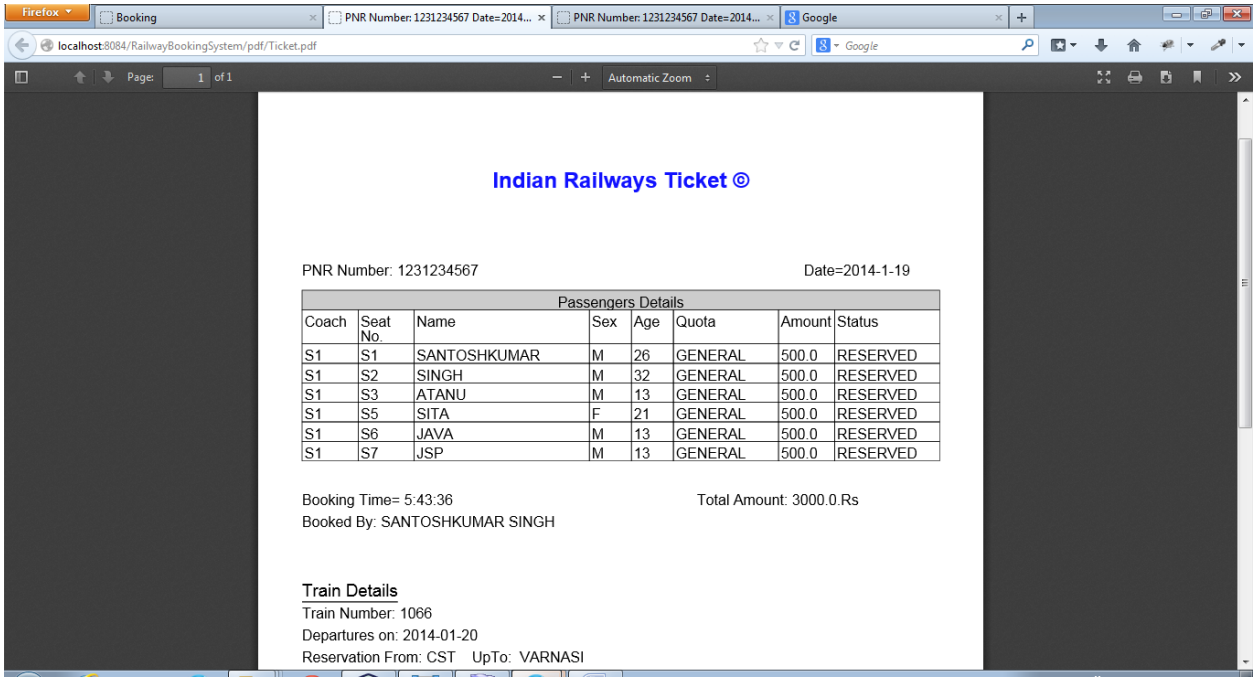
Railway Reservation System : Fare Query



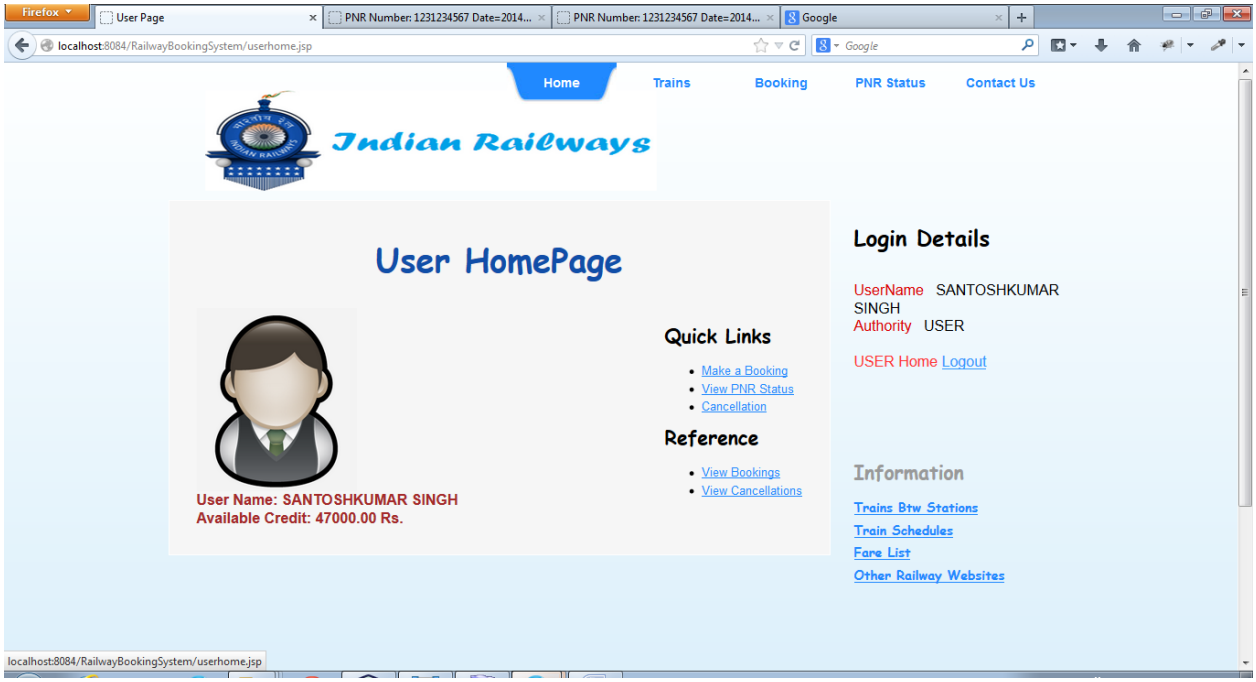
Railway Reservation System : PRN Status



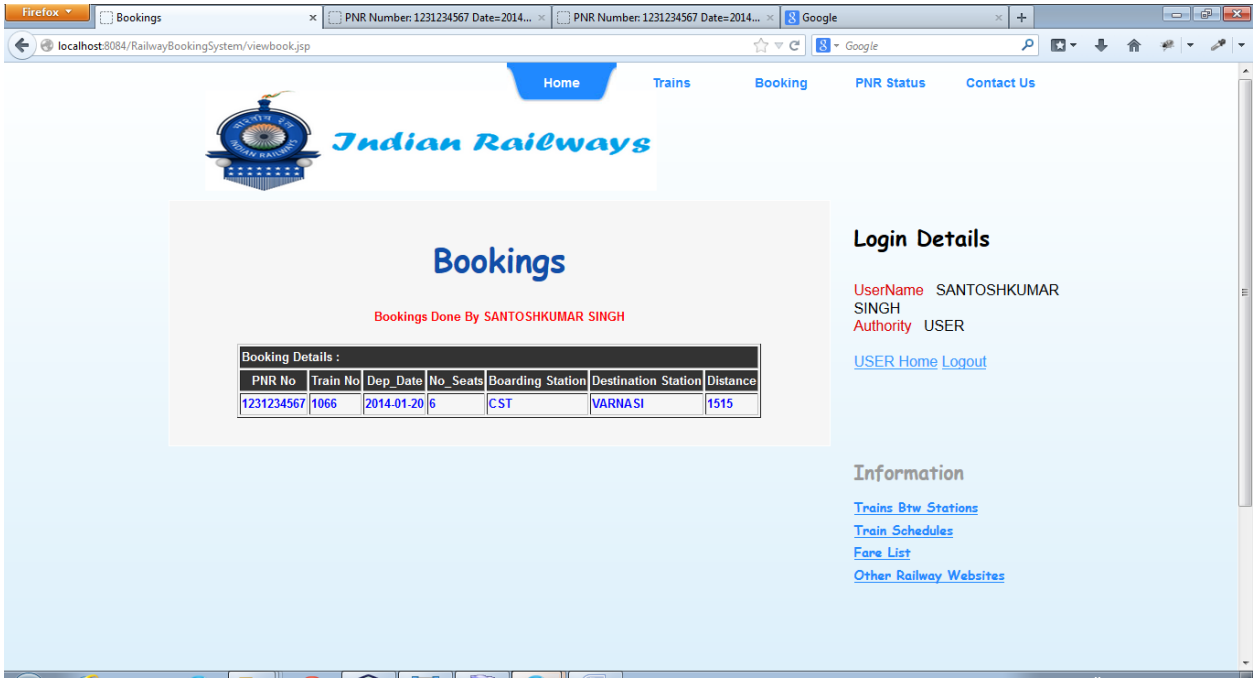
Railway Reservation System : Print Ticket



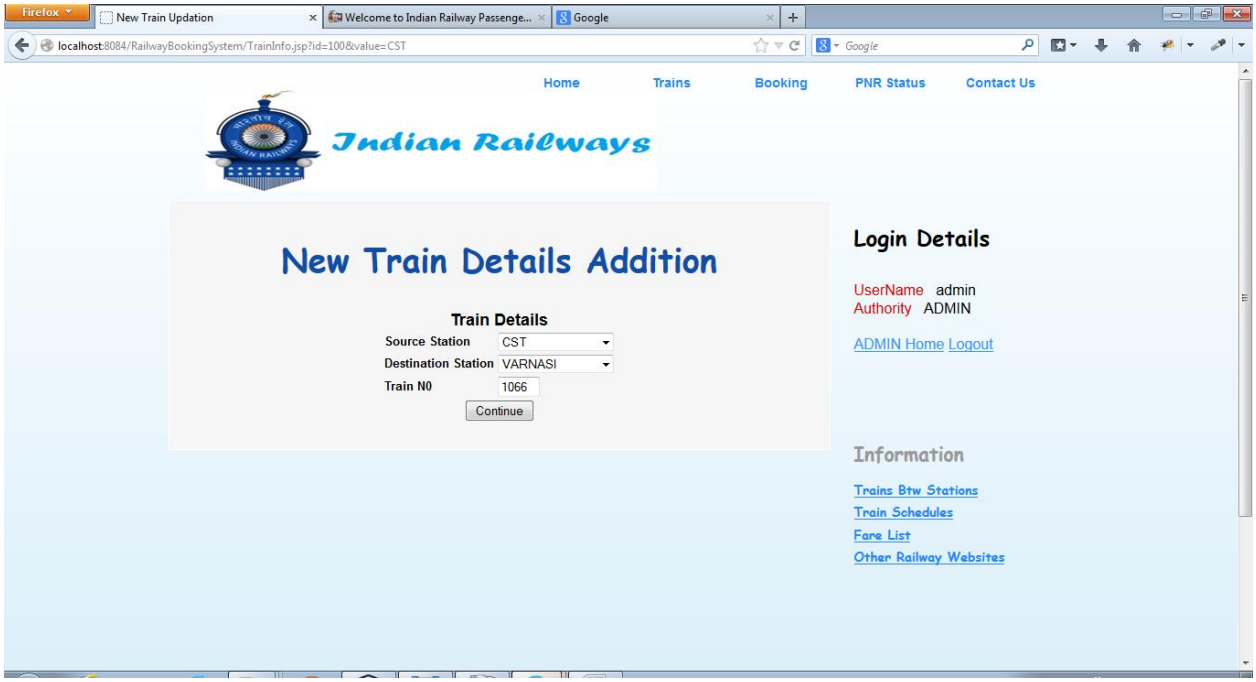
Railway Reservation System : User Home Page Options



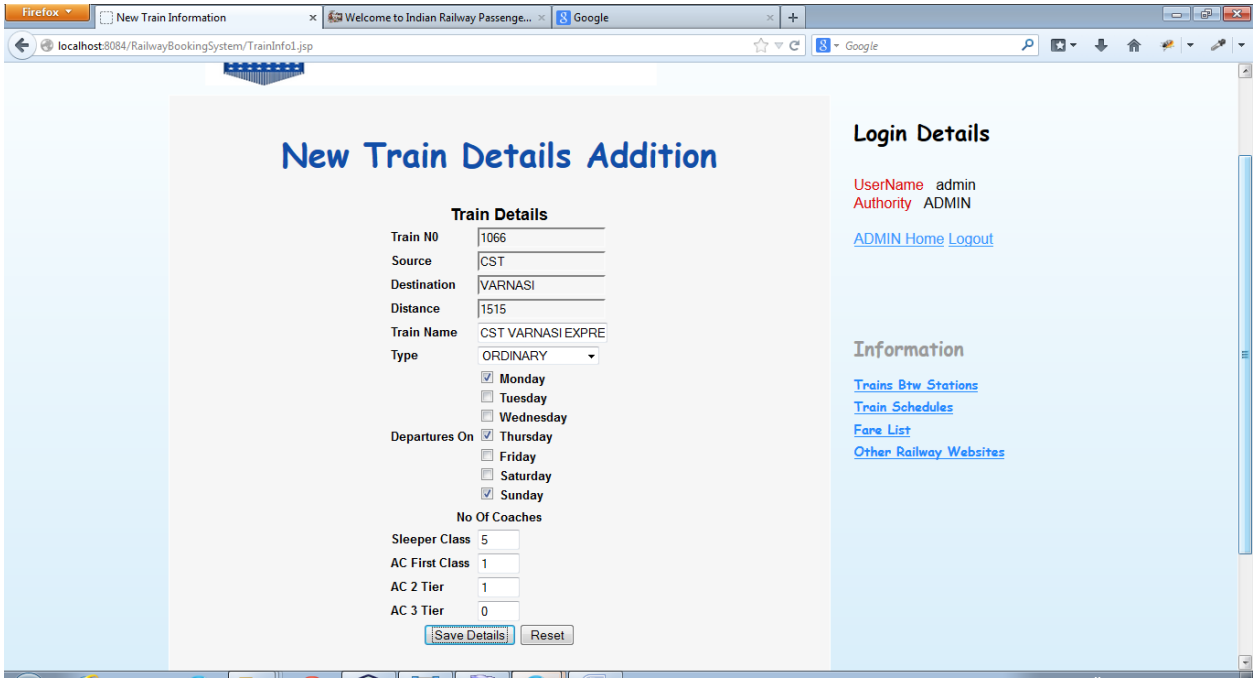
Railway Reservation System : Booking History



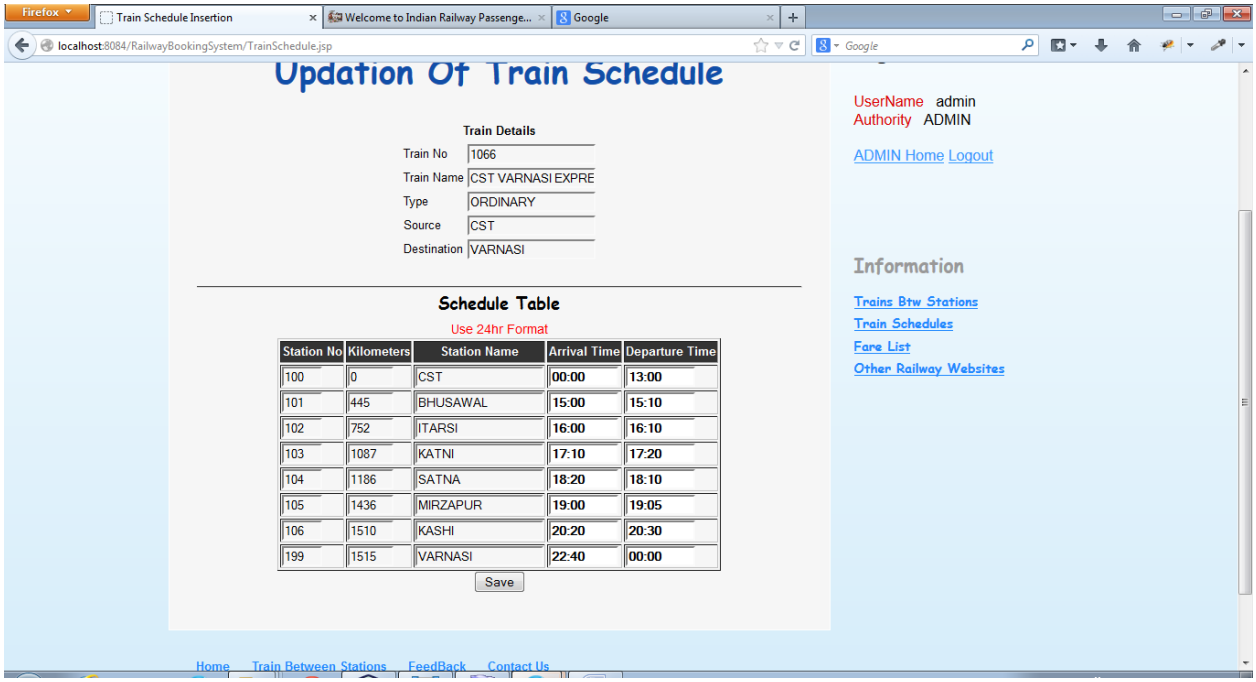
Railway Reservation System : New Train Details Addition



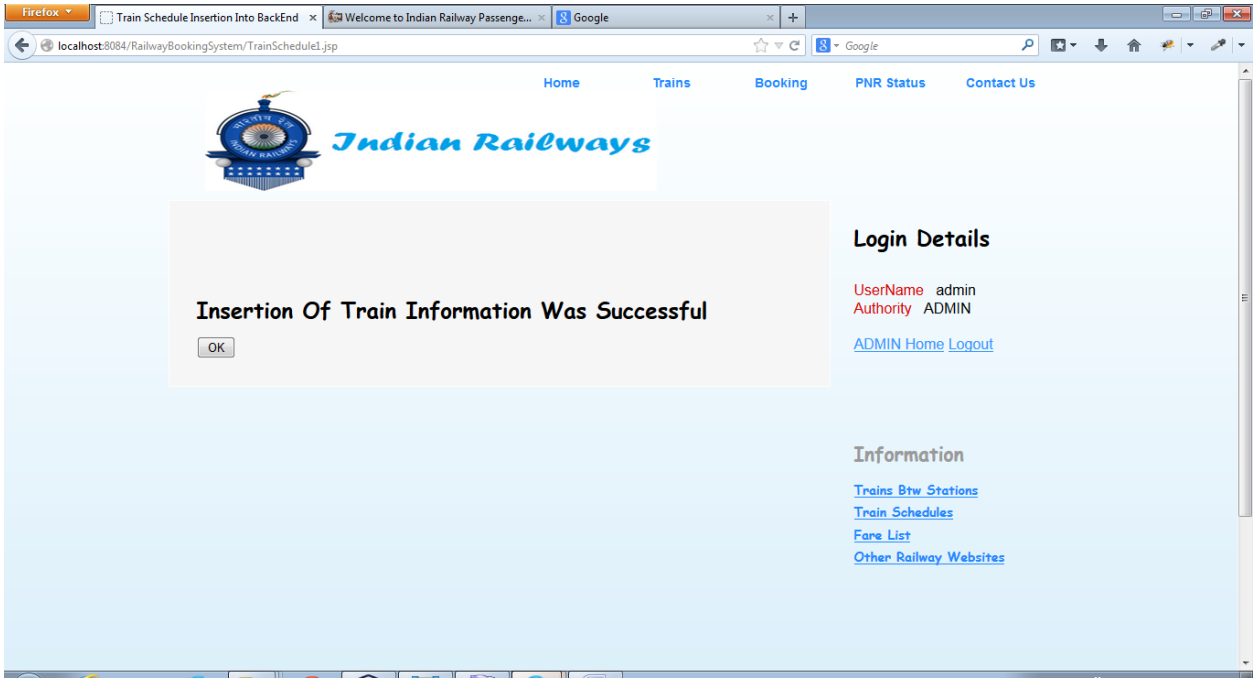
Railway Reservation System : New Train Information



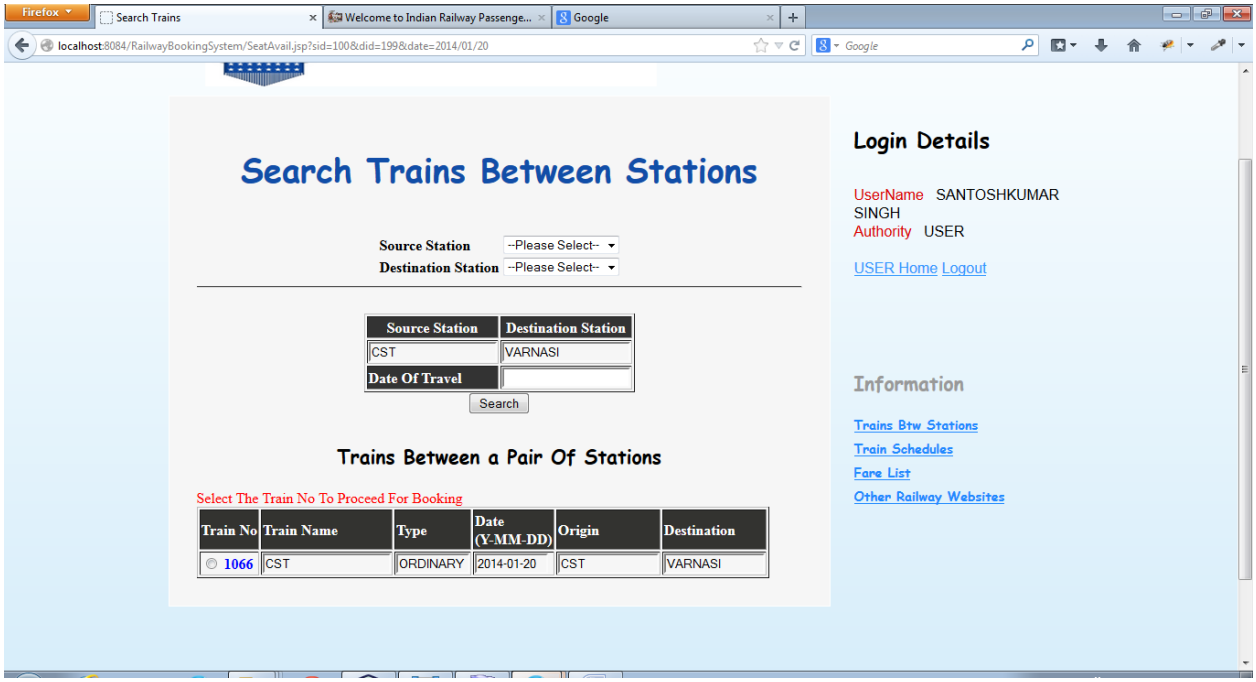
Railway Reservation System : Train Schedule



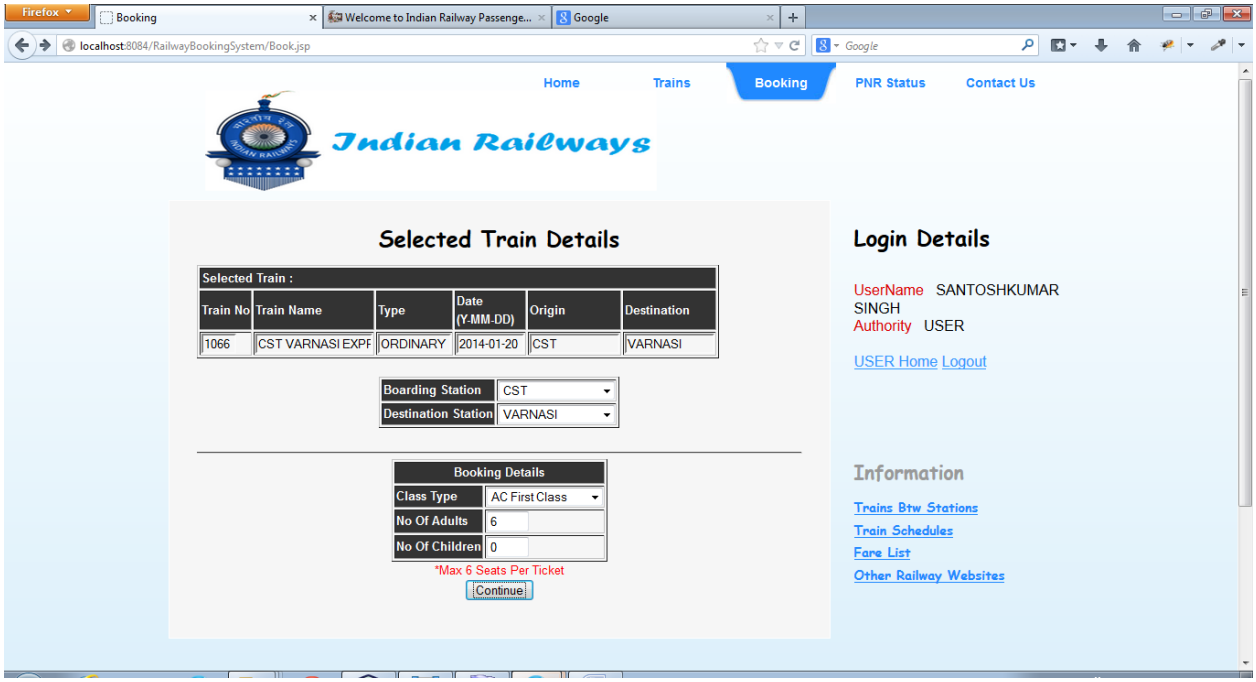
Railway Reservation System : Train Information Updation



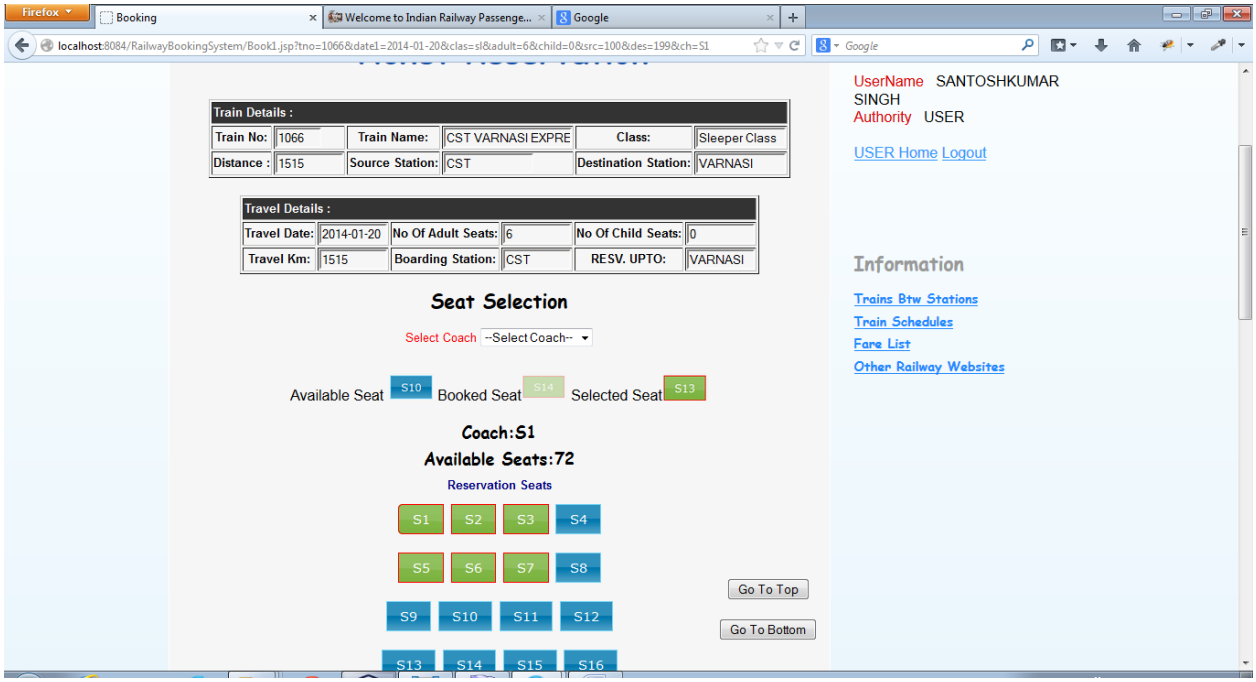
Railway Reservation System : Search Train Stations



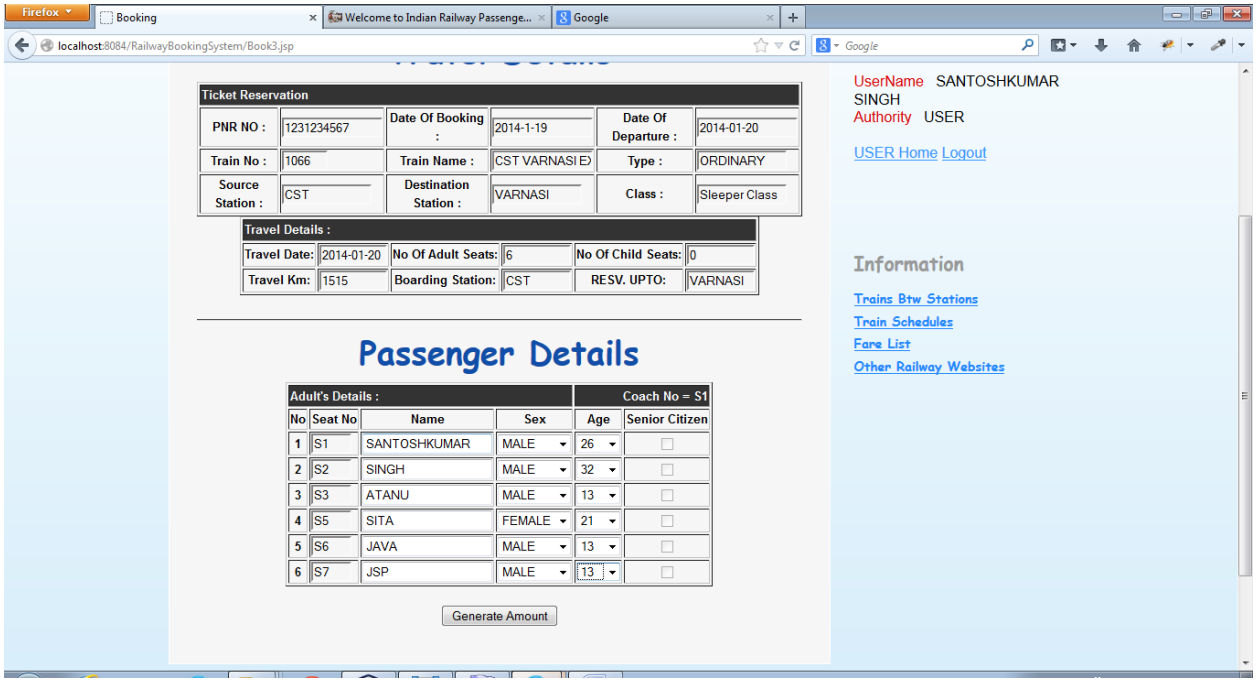
Railway Reservation System : Train Schedule View



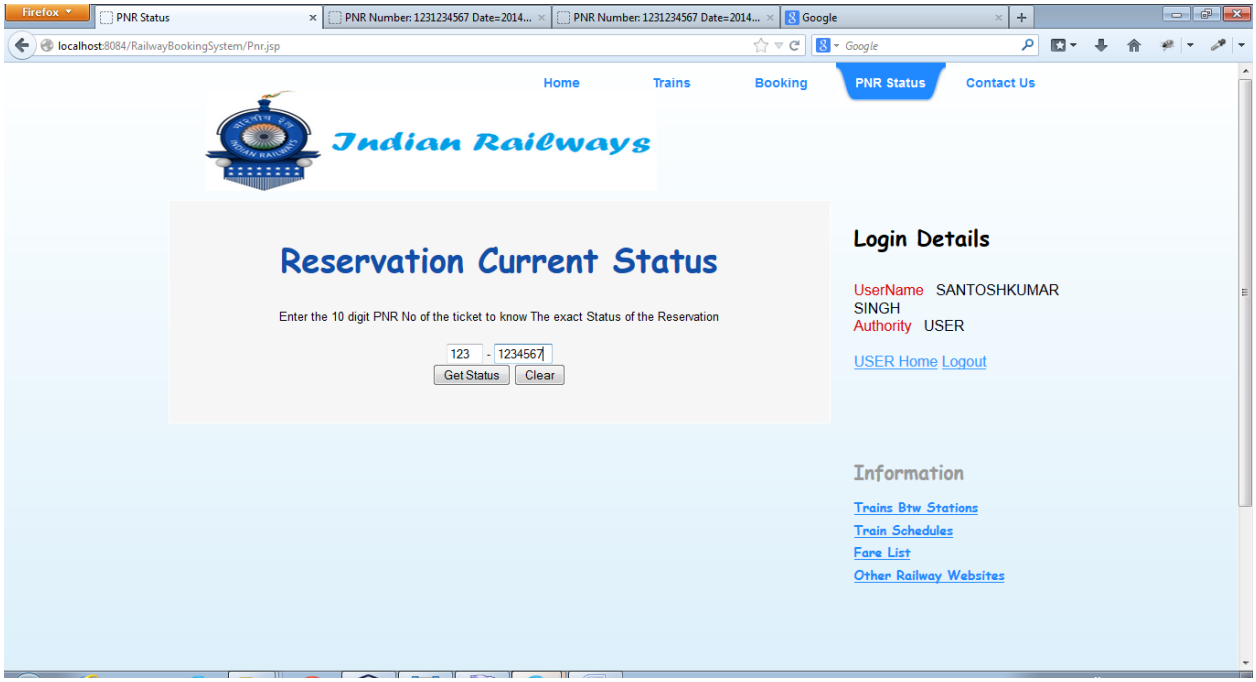
Railway Reservation System : Seat Selection



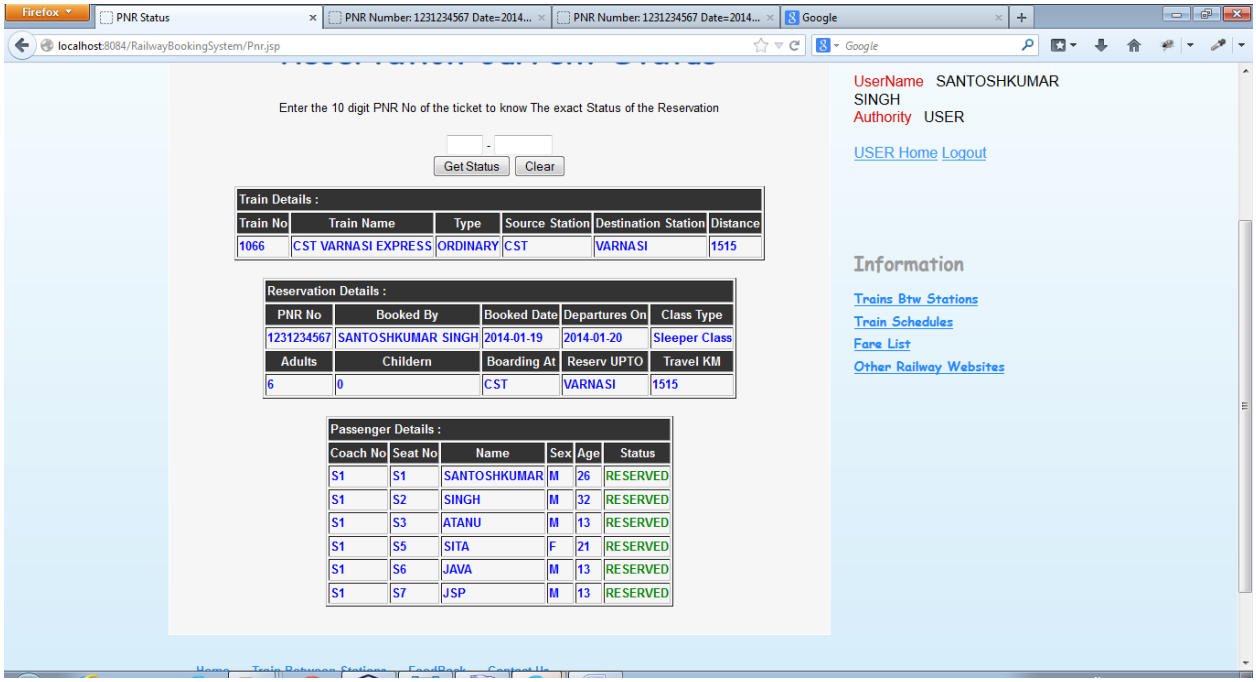
Railway Reservation System : Passenger Details



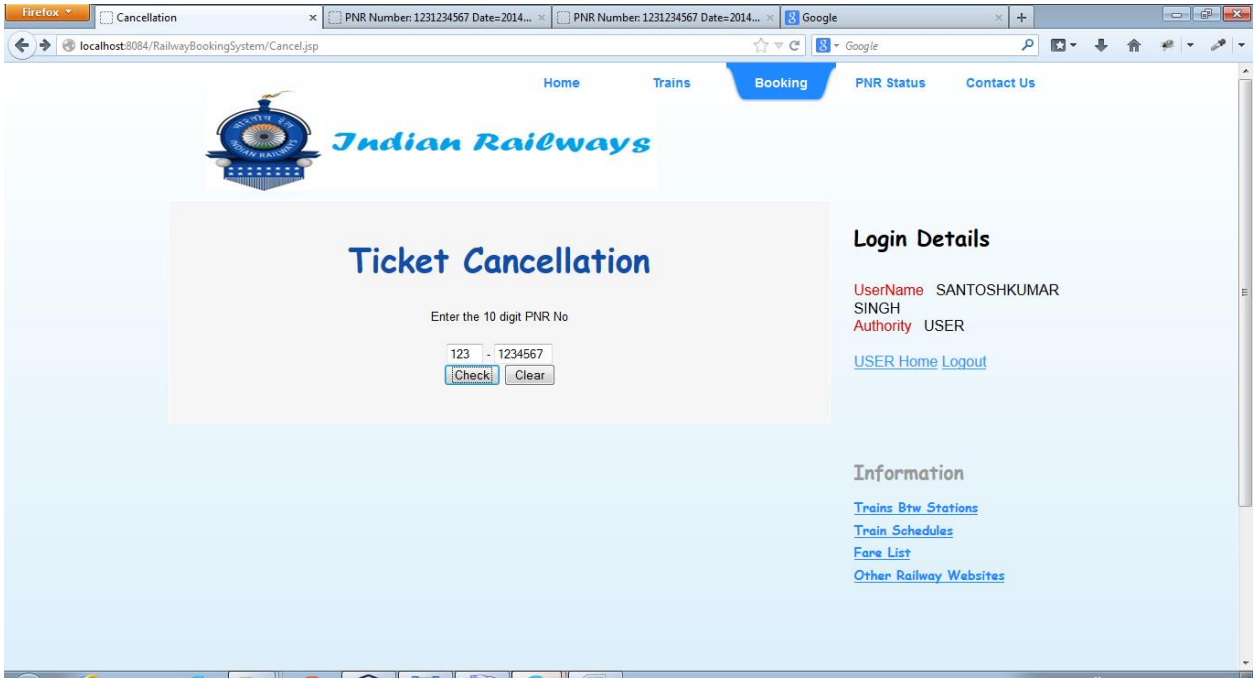
Railway Reservation System : Reservation Status



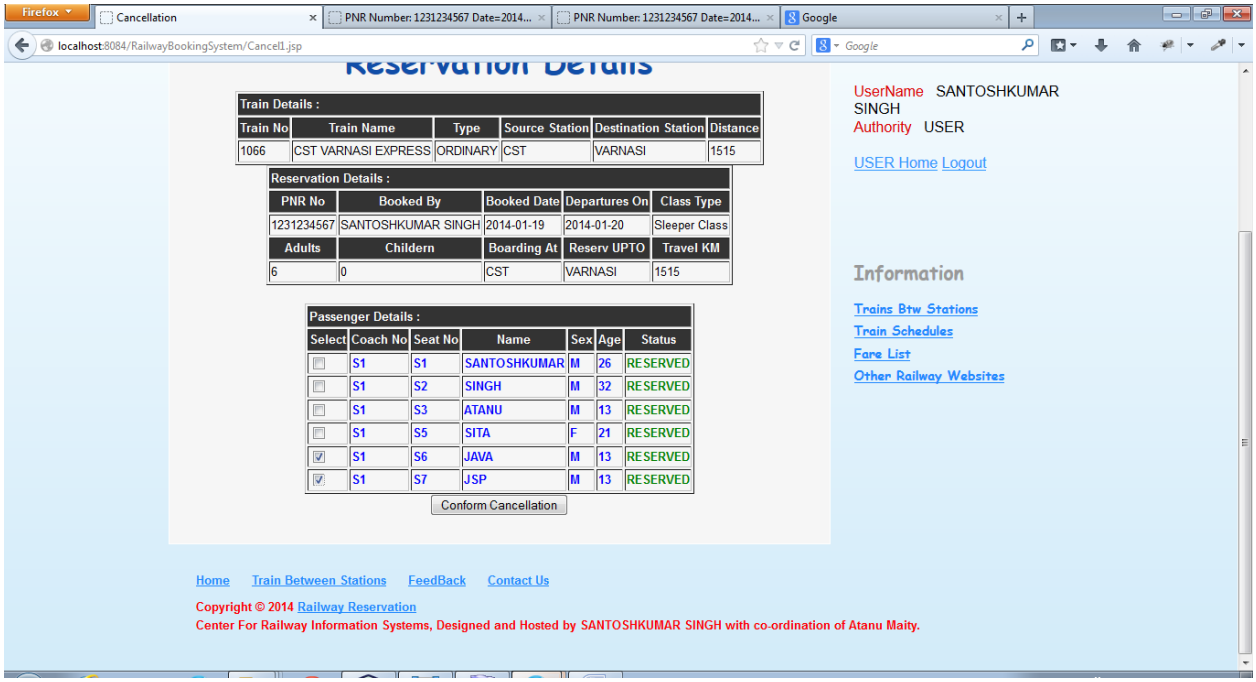
Railway Reservation System : Get Ticket Status



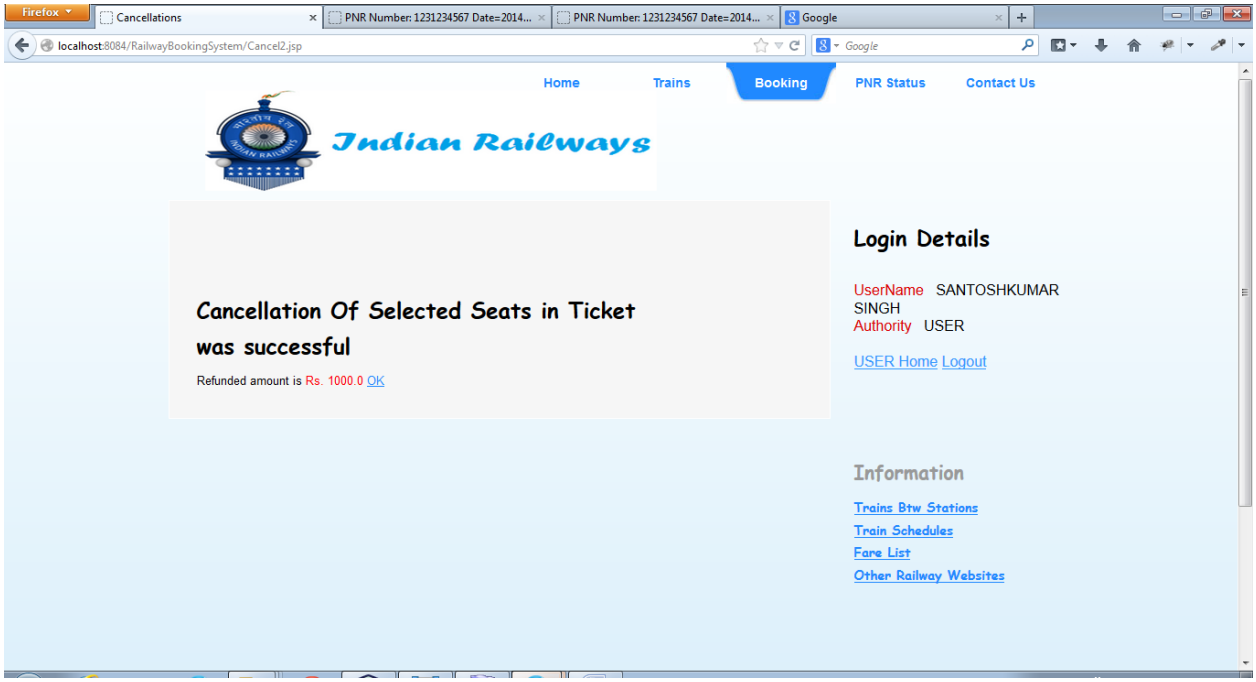
Railway Reservation System : Ticket Cancellation



Railway Reservation System : View Cancel Ticket Information



Railway Reservation System : Cancellation Confirmation



Railway Reservation System Test Plan

Introduction

This document describes the user acceptance test plan for the Railway Reservation System. The complete test strategy for the Railway Reservation System is to perform the following kinds of tests, in sequence:

1. **Component testing** of each component that makes up the Railway Reservation System
2. **Integration testing** of the Railway Reservation System, to ensure the correct interworking of its components
3. **Validation testing** of the Railway Reservation System, to ensure that it works correctly in a pseudo-live environment
4. **User acceptance testing** of the Railway Reservation System, to ensure that its function is acceptable to its users

Acceptance testing is the last set of tests to be performed before the application goes officially live.

Test Scope

The scope of the user acceptance testing covers:

- Version 1 of the Railway Reservation System
- User-facing functionality defined by a set of use cases
- Administrator-facing functionality defined by a set of use cases

The aim of the testing is to determine how well the application meets its functional requirements from the perspective of the user, and to identify any issues so they can be resolved. Also, the testing serves to compile a set of test data and results that can be used during subsequent test cycles, to test for non-regression of the software in later releases or after the application is in maintenance.

Working practices might vary from user to user and are considered outside the scope of the testing.

Test Strategy

The basis of user acceptance testing is that other tests were completed successfully, so the application and its required infrastructure are considered to be stable and reliable. Acceptance testing concentrates on the application from the user's perspective, that is, how the application is used and whether it meets the necessary quality criteria.

Change requests will be sent to the development team as the actionable documentation. Change criteria will be determined by the Test team and the Development team prior to the beginning of testing. For instance, criteria may include *impact to desired functionality, amount of code impacted by proposed change,* and *design required by proposed change*. The tester will evaluate the criteria. The test lead will determine Change Required or not. Once a bug has been determined as Change Required, the bug report will be translated into a Change Request and passed on to development.

The customer of the acceptance testing is the System Users, Supervisor and Adminstratorfor Railway Reservation System. The progress of the acceptance testing will be reported to the customer, together with any issues that are discovered and their planned resolutions. Sign-off of the tests, and therefore the acceptance of the application, will be performed by the customer or a selected representative.

Preconditions

The following items are required before testing can take place:

- A complete and coherent functional specification of the Railway Reservation System expressed as use cases and usage scenarios
- A complete and validation-tested release of Railway Reservation System, delivered according to the delivery plan
- An agreed-upon procedure for dealing with any anomalies that are discovered during the testing process
- A set of test specifications describing how each functional area of the Railway Reservation System is to be acceptance tested
- An implemented test environment for the testing
- Sufficient, suitable resources to carry out the testing
- Available standards for the acceptance testing

Test Priorities

During testing of the Railway Reservation System, the following qualities will be tested in order of priority:

- Functionality—whether the required functions are available and working as expected
- Usability—how user-friendly and intuitive the Railway Reservation System is
- Security—how well-protected and guaranteed corporate and user data is
- Performance—whether the response times are within acceptable limits
- Customization—how straightforward it is to use the application in new, unpredicted ways

Test Techniques

The following techniques will be applied:

- Scripted tests—sequences of user interactions (based on the use case and usage scenarios) using predefined data sets against predicted results
- Unscripted tests—based on scripted tests, the tester tries to modify the scenarios to explore what-if possibilities
- Penetration tests—scripted tests to attempt unauthorized entry into the system
- Usability checklists—tests to determine the complexity of interactions
- Performance statistics—generation of performance information to check against desired performance criteria

Test Organization

Roles and Responsibilities

The following roles are defined:

- QA lead/test manager—responsible for planning and ensuring the smooth running of the test process
- Tester—carries out the tests according to the test plan, and then reports the results
- Product manager—ensures that the tests are carried out successfully from a user perspective
- Project sponsor/client—acts as main stakeholder, and ensures that the needs of the customer community as a whole are considered
- Test support—provides technical assistance, such as test environment configuration, and non-technical assistance, such as methodological support

Weekly team meetings will be held involving the test manager, testers, and product managers. At these meetings, the progress of the testing process will be reported, any issues will be discussed, and actions will be agreed upon.

Deliverables

The following deliverables will be expected from the user acceptance testing process:

- Test plan—this document, together with any updates that have occurred during the testing process
- Change requests—any bugs, defects, or other changes required to the Railway Reservation System as a result of the testing process
- Weekly reports—progress reports to enable the status of the testing process to be determined
- Completion report—a report to be signed off by the customer, to signify the successful completion of the user acceptance testing

Test Environment

Hardware and Software

The test environment will consist of:

Server

A single Intel-based computer running:

- Microsoft Windows
- Railway Reservation System components

Client Workstations

Two Intel-based client laptop computers, each running:

- Microsoft Windows XP Professional
- Microsoft Office
- IE

The following additional hardware will be required:

- One laser printer to print reports
- One color printer (laser or inkjet) to print screen dumps
- One CD-ROM drive to enable clean installation of the Railway Reservation System
- Networking connectivity to permit interconnection of the server, clients.

Testing Automation Software

No testing automation software packages are selected at present.

Application Configuration

The following user accounts will be configured on the server:

- System Administrator
- System Users 1
- System Users 2
- Supervisor

Test Management

Tests shall be managed according to the corporate test management standards, which cover:

- Conduct of tests
- Reporting of test results
- Defect tracking and resolution
- Configuration management of the test environment
- Configuration control of test deliverables.

Testing Schedules

The user acceptance testing schedules are shown in the project structure document and resulting Gantt charts.

Threats to Testing

Potential threats to the testing process are as follows:

- **Insufficient resources available for testing.** Testing resources have been seconded from the development departments, whose time is at a premium. Mitigation: ensure department heads apply a high priority to the testing of the Railway Reservation System.
- **Availability of sales personnel for testing.** The test team should be overseen by at least one sales representative. Mitigation: gain prior agreement from the vice president of Sales for two sales representatives to be assigned to test the application.

Test Case

System User Login Page (login.jsp)

Description

A user wants to login to eRail web site.

Test Actions

- User type the URL of eRail web site
- Clcik on Login link, login screen display
- Type the User Name and password.
- Click on Log IN to login.
- Check returned information against expected results

Test Cases

Test Case Id	Test Condition	Test Data	Expected Result	Actual Result in Test Cycle / Description
1	Blank User Name and blank password.		System should display message "Enter User Name and Password"	Ok
2	Enter User Name and Blank password		System should display message "Enter Password"	Ok
3	Enter blank User Name and password		System should display message "Enter User Name"	Ok
4	User enter wrong User Name and password		System should display message "Wrong User Name and password, can not login"	OK

5	User enter correct User Name and password	Data from user table	System should redirect to admin home page	OK

14.14.2 Home Page (Admin/index.jsp)

Description

After successful login system displays home page, this page contains link for Select various link based on login type.

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Test Actions

- Browse the eRAIL site.
- Click login page.
- Type correct user name and password and click Log In button.
- System redirects Home page.
- Check returned information against expected results

Test Cases

Test Case Id	Test Condition	Test Data	Expected Result	Actual Result in Test Cycle / Description
1	Check welcome message		System should display currently logged user name and link for other pages	Ok
2	User Login	User master	System should display navigation link for my Account, Fund Transfer	Ok
3	Check Navigation Link.		System should display link to open/navigate the page	Ok

14.14.3 New Vehicle (admin/add train.jsp)

Description

This page is used to enter new train details.

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Test Actions

- Browse the eRAIL site.
- Login into site
- Browse vehicle link
- Click Add New button.
- Type all information and press submit button.
- System redirects user details page if details are saved successfully.
- Check returned information against expected results

Test Cases

Test Case Id	Test Condition	Test Data	Expected Result	Actual Result in Test Cycle / Description
1	Admin enters blank Train name and press save button.		System should display message “Enter train name”	Ok
2	Admin enters blank train no and press save button.		System should display message “Enter train no”	Ok
3	Enter all valid information		System should display “Record is saved” and display train details in grid.	OK

Conclusion and future enhancement

This project was developed to fulfill user and business requirement; however there are lots of scope to improve the performance of the Railway Reservation System in the area of user interface, database performance, and query processing time. Etc.

So there are many things for future enhancement of this project. The future enhancements that are possible in the project are as follows.

- Linking and integration of any legacy system for accounting.
- Integration with travel agent through Web Services
- Connection to third-party OLAP applications
- Electronic Data Interchange (EDI) system between banks, other credit verification agency and their vendors
- In the area of data security and system security.
- Provide more online tips and help.
- To optimize the query which is embedded in the system.

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