# Software Requirements Specification

for

# Indian Railway Reservation System

**Version 1.1 approved**

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**February 25,2018**

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# Revision History

| Name | Date | Reason For Changes | Version |
|---|---|---|---|
| SRS for IRRS | 25/02/2018 | Inclusion of Appendix B:Design Diagrams | 1.1 |
| | | | |

# 1. Introduction

## 1.1 Purpose

Indian Railway Reservation System is the product we have with revision or release number 1.1. The purpose of this product is to provide a portal for the railway passengers to book ticket, view booking history, cancel ticket.

## 1.2 Document Conventions

This document follows MLA Format. Bold-faced text has been used to emphasize section and sub-section headings. The remainder of the document will be written using the standard font, Times New Roman.

## 1.3 Intended Audience and Reading Suggestions

1. Developers who can review project's capabilities and more easily understand where their efforts should be targeted to improve or add more features to it (design and code the application – it sets the guidelines for future development).
2. Project testers can use this document as a base for their testing strategy as some bugs are easier to find using a requirements document. This way testing becomes more methodically organized.
3. End users of this application who wish to read about what this project can do.

## 1.4 Product Scope

"Indian Railway Reservation System" is an attempt to simulate the basic concept of an online Reservation system. The system enables to perform the following functions:

1. Searching For Train.
2. Booking of seat in selected compartment of a particular train.
3. Payment.
4. Cancellation of booked ticket.
5. Improved and optimized service.

## 1.5 References

[1] IEEE Software Engineering Standards Committee, "IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications", October 20, 1998.

# 2. Overall Description

## 2.1 Product Perspective

Indian Railway Reservation System is a web based application proposed with the following

1. The computerization of the reservation system will reduce a lot of paperwork and hence, the load on the railway administrative staff.
2. The machine performs all calculations. Hence, chances of error are nil.
3. The passenger, reservation, cancellation list can easily be retrieved and any required addition, deletion or update can be performed.
4. The system provides for user-ID validation, hence unauthorized access is prevented.

## 2.2 Product Functions

Booking agents with varying levels of familiarity with computers will mostly use this system. With this in mind, an important feature of this software is that it be relatively simple to use.

The scope of this project encompasses: -

1. **Search:** This function allows the booking agent to search for train that are available between the two travel cities, namely the "Departure city" and "Arrival city" as desired by the traveler. The system initially prompts the agent for the departure and arrival city, the date of departure. It then displays a list of train available between the designated cities on the specified date.

2. **Selection:** This function allows a particular train to be selected from the displayed list. All the details of the train are shown :
   - Train number.
   - Place of departure.
   - Place of arrival.
   - Departure time.
   - Train availability (y/n) on week days.
3. **Review**: If the seats are available, then the software prompts for the booking of train. The train information is shown. The total fare including taxes is shown and flight details are reviewed.
4. **Traveler Information**: It asks for the details of all the passengers supposed to travel including name, address, telephone number and e-mail id.

5. **Payment**: It asks the agent to enter the various credit card details of the person making the reservation.
   - Credit/debit card type.
   - Credit/debit card number.

- CVC number of the card.
- Expiration date of the card.
- The name on the card.

6. **Cancellation :** The system also allows the passenger to cancel an existing reservation. As the system displays the booking history. The passenger can review an existing booking and can cancel the booked ticket. The amount deducted will be refunded to respective bank account used at the time of payment within given period of time.

## 2.3 User Classes and Characteristics

There are three types of users that interact with the system: Existing member of IRRS, Booking agent of IRRS, advertiser and administrator. Each of these three types of users have different use of the system, so each of them have their own requirements. The users are differentiated by access to following modules.

**2.3.1 IRRS member login:** This module is used to allow valid IRRS member to book ticket. This module will be enabled only to the valid/existing member of IRRS and other users can't access this module. This module contains:

- A separate screen should be provided to allow member to search for trains, review booking history and book the tickets.
- A separate screen should be provided to allow member to update profile information including password change.

**2.3.2 IRRS booking agent:** This module is used to allow valid IRRS booking agent to book tickets for customers those who approach to the agent. This module will be enabled only to valid IRRS booking agent and other users can't access this module. This module contains:

- A separate screen should be provided to allow booking agent to search for trains, review booking history and book the tickets.

**2.3.3 Advertiser:** In this module an advertiser can place his/her adds. This module will be enabled only to those who wish to place an add in IRRS other users can only view this information. This module contains :

- A separate screen should be provided to allow advertiser to place add. It also includes type of add, image of add, bill payment of IRRS for placing add.

**2.3.4 Administrator :** In this module an administrator is allowed to update train details for existing trains, add new train , remove train , increase/decrease ticket fare.

## 2.4 Operating Environment

This web-based application shall operate on any higher versions of web browser like Mozilla, Internet Explorer, Netscape Navigator, and Opera. This application shall permit user access from the corporate Intranet and, if a user is authorized for outside access through the corporate firewall, from an Internet connection at the user's home.

## 2.5 Design and Implementation Constraints

**CO-1: Hardware Limitations**- Dependency on connectivity, bandwidth constraints in different regions across the country for Web based interface.

**CO-2: Software limitation**-The system shall use the MySQL database engine. All scripts shall be written in php.

## 2.6 User Documentation

The system shall provide a hierarchical and cross-linked help system that describes and illustrates all system functions. The first time a new user accesses the system and on user demand thereafter, the system shall provide a menu of different user graphical interface such as procedure to search trains and book ticket, review booking history and cancel ticket.

## 2.7 Assumptions and Dependencies

- Booking agents and existing members of IRRS will be having a valid user name and password to access the web application.
- The web application needs booking agent and existing members of IRRS to have complete knowledge of web application.
- Software is dependent on access to internet.

# 3. External Interface Requirements

### 3.1 User Interfaces

Front end Software: HTML, CSS, Java Script.

Back End Software-php, ASP.NET AJAX.

The user interface shall follow basic Windows style and functionality conventions. The web application will be user friendly.. The web application will be designed so that with minimum number of clicks user should be able to access desired information. Screens will be economically designed. Wherever possible, input fields will be pre-populated.

## 3.2 Hardware Interfaces

Operating system: Windows, Linux.
Browser which supports ASP.NET, Javascript.

The application can run on any hardware which supports any of the above operating systems. To host the application, hardware servers will be required for Application server (Content Management). The database is created using my phpAdmin provided by php which stores information in the server's database.

## 3.3 Software Interfaces

| | |
|---|---|
| Softwares used | php, ASP.NET |
| Operating system | Windows, Linux |
| Database | MySQL |

On Server end, in addition to base Operating system, application will be required for internet server, Content Management, Database, application frameworks. The system requires a properly configured version of any of the mentioned OS in order to run the application.

## 3.4 Communications Interfaces

To access the application, internet connectivity will be needed at both server side as well as client side. This project supports all types of web browsers. All data transferred between the server and the individual computers over an Ethernet connection or WiFi.

# 4. System Features

The following requirements detail the major functions that the system must perform.
REQ-1 The registered user shall be allowed to login using credentials.

REQ-2 The unregistered user shall be allowed to register as member/booking agent of IRRS.

REQ-3 Authenticated user logged in as a member/booking agent of IRRS should be allowed to view booking history, updated information about his/her profile, search for trains, book the ticket and cancel the ticket.

REQ-4 The system should be able to display information about various trains to the authenticated users of type member and booking agent of IRRS on specified date along with the available seats and compartment.

REQ-5 The system should keep the information about various train details and route details up to date as added, deleted or updated by the authenticated admin.

REQ-6 The system should be able to display fields for entering passenger details such as name, age, gender, mobile number, senior citizen, identification number, berth selection on selected train to the authenticated users of type member and booking agent of IRRS on specified date along with the available seats in the selected compartment.

REQ-7 User shall be allowed to perform payment by choosing given option and fare amount must be deducted from related bank account.

REQ-8 The system should allow advertiser to place add and placed add should be visible to all type of users.

## 4.1 Login

### 4.1.1 Description and Priority:

This function allows a registered user to login his account using his username with password. If a user is not registered, the application allow the user to register.

### 4.1.2 Stimulus/Response Sequences

It consists of two fields User ID and Password.

### 4.1.3 Functional Requirements

The most important function is to grant access only to the registered users. Authentication is provided by validation of the credentials against the records stored in the database. In case of an invalid entry access is not allowed and invalid message is displayed otherwise home page is displayed.

Related Requirements: REQ-1.

## 4.2 Registration

### 4.2.1 Description and Priority

This function allows unregistered user to enroll as a member / booking agent of IRRS and create a new account. In order to create a new account, the user has to provide

required information such as first name, last name, email address and password. Every new user can register by clicking on "register" button specified in respective section.

### 4.2.2 Stimulus/Response Sequences

Registration page is displayed. It will consist of many text fields such as, first name, last name, email address, password, phone number and create account button.

### 4.2.3 Functional Requirements

The system checks if all required data are provided when create account button is pressed, if yes and then creates the account else it prompt window appears stating to enter required fields. After all required fields are entered and create account button is pressed the system saves the entered details in MySql database.

Related Requirements: REQ-2

## 4.3 Account access and usage

### 4.3.1 Description and Priority:

This function/module allows the valid user of IRRS to access his/her account after authentication. This module allows existing member and booking agent of IRRS type of users to search for train, book ticket, review booking history and cancel ticket.

### 4.3.2 Stimulus/Response Sequences

It will consist of a text fields to enter "from", "to" fields, select date of journey and search button. A separate table for reviewing booking history and cancel booked ticket will be provided. A separate table for displaying applicable trains as result of search option.

### 4.3.3 Functional Requirements

The authenticated user should be able to view booking history, able to search trains on specified date, book selected train. The system must display all applicable trains on selected route and on specified date.

Related Requirements: REQ-3, REQ-4.

## 4.4 Entry and updating

### 4.4.1 Description and Priority

This function/module is used to maintain the various details about train, train routes and offers. This module allows admin type of users to add, delete or update information about trains, routes and offers. Users registered as member, booking agent can view this information.

### 4.4.2 Stimulus/Response Sequences

It will consist of a table to enter train details and routes.

### 4.4.3 Functional Requirement

The authenticated admin user should be able to add, delete or update train details latest information about various trains, new routes and offer schemes. The system must display latest updated information.

Related Requirements: REQ-5.

## 4.5 Passenger details

### 4.5.1 Description and Priority

This feature allows user to fill out passenger details such as name, age, gender, mobile number, senior citizen, identification number, berth selection on selected train. User registered as member and booking agent of IRRS can fill this.

### 4.5.2 Stimulus/Response Sequences

It will consist of a page showing the text fields, option and check box to fill in the details of passenger.

### 4.5.3 Functional Requirements

The authenticated user should be able to fill out the passenger information that has been asked.

Related Requirements: REQ-6.

## 4.6 Payment and Bank

### 4.6.1 Description and Priority

This function allows user to see the payment option credit/debit and choose according to it. The fare amount is deducted from bank account related to the credit/debit card.

### 4.6.2 Stimulus/Response Sequences

This will open the page to choose between credit/debit card and enter the details of card such as card number, cvv, expiry, name on card for performing bank related operation.

### 4.6.3 Functional Requirements

The system should verify that entered details are correct and should successfully deduct fare amount from bank account related to credit/debit card.

Related Requirements: REQ-7.

## 4.7 Advertisement

### 4.7.1 Description and Priority

This module allows advertisers to place their adds on IRRS.

### 4.7.2 Stimulus/Response Sequences

This will open the page providing advertiser to upload image of add and bill payment receipt for IRRS and agreement statement with IRRS policies.

### 4.7.3 Functional Requirements

The system should allow uploaded image to be stored on database and receive payment made by advertiser for placing the add.

Related Requirements: REQ-8.

# 5. Other Nonfunctional Requirements

## 5.1 Performance Requirements

The system must be interactive and the delays involved must be less. 90% of the responses for static web pages should be within 2 seconds. 5-10 second for user operation on data (for e.g. sorting of data in a column) or 5 to 50 records per page up to max of 100,000

records. 10-20 second for user awaiting response from the system upon executing a transaction (for e.g. a query/update). 4:1 minute for unacceptable response time.

## 5.2 Safety Requirements

No safety requirements have been identified.

## 5.3 Security Requirements

The system should have protection against:

SR-1: Unauthorized creation/modification/publishing of data through user name and password authentication as defined for relevant user groups.

SR-2: Unauthorized viewing of data through user name and password authentication as defined for relevant user groups.

SR-3: The web application should adhere to security guidelines, standards and policies prescribed by NIC's Security Division and should be audited & certified for compliance to these standards by Security Division before it is hosted in Production Environment.

SR-4: The application should be protected against any unauthorized access.

## 5.4 Software Quality Attributes

1. RELIABILITY: From the application portal, it is expected that there shall not be any bug and the system shall be tested on end cases to offer user a quality and reliable package.
2. ROBUSTNESS: Due to any human interventions, the system should not behave abnormally. In case of application or a hardware failure, the system should re-initiate immediately. In case of a possible hardware failure or corruption of database the system administrator should immediately restore the backup.
3. AVAILABILITY: Application shall be up and running and must be available 24x7 and any one shall be able to connect to it from anywhere. It shall trap all errors and prevent users from accessing unauthorized areas of the application.
4. MAINTAINABILITY: The administrators should maintain correct information on the website.
5. CORRECTNESS: The information (textual or video) should be displayed with accuracy.

### 5.5 Business Rules

An admin can upload train information (textual/ video), update or delete information. An user can view information, search for train, book ticket, review booking history, cancel ticket and perform bank related operation.

## 6. Other Requirements

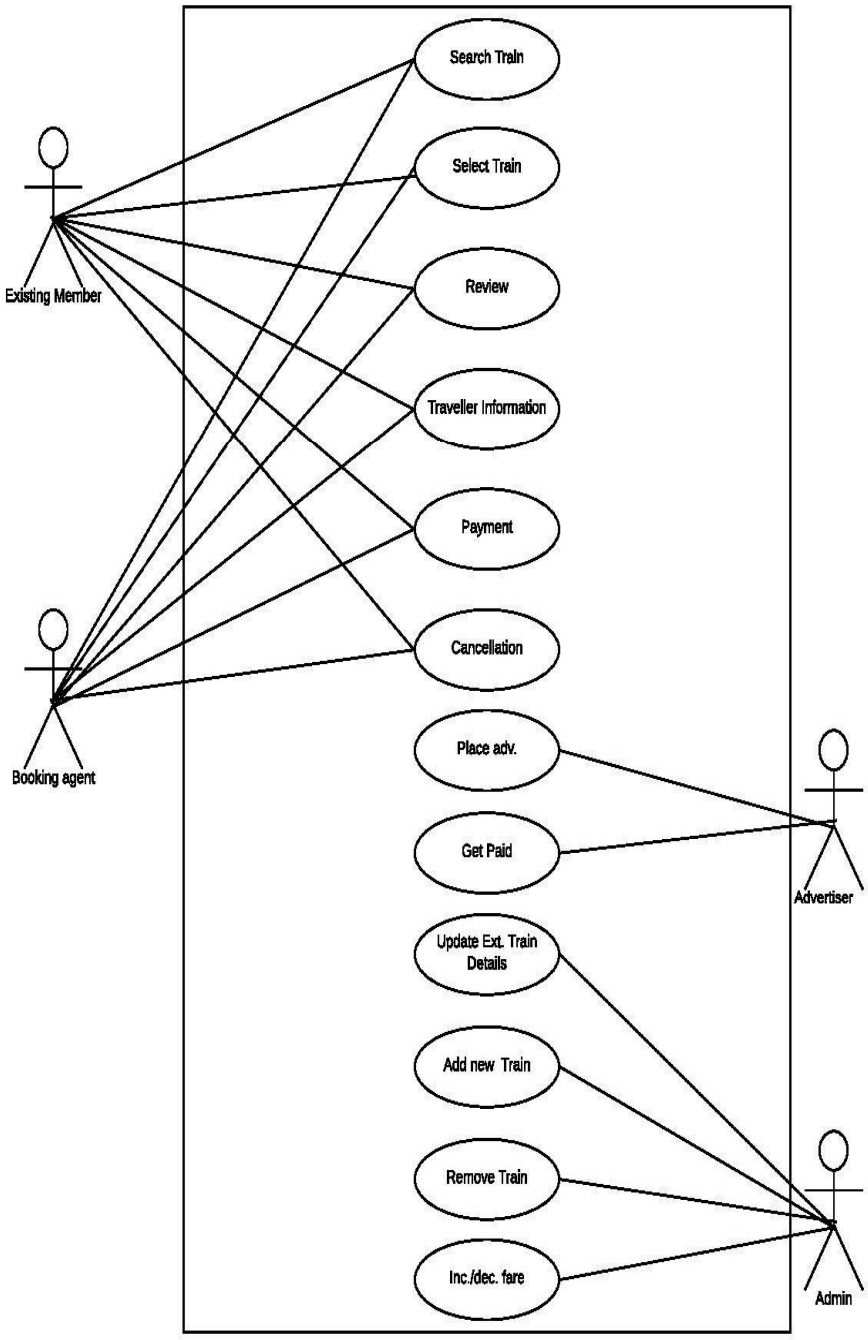
## Appendix A: Glossary

| Term | Definition |
|---|---|
| Existing member of IRRS | Registered member of IRRS. |
| User | Existing member, booking agent, advertiser, administrator. |
| Booking Agent | Registered booking agent of IRRS. |
| Administrator | Person who manages the system and performs operations like addition, deletion and modification of information related to train. |
| Software Requirements Specification | A document that completely describes all of the functions of proposed system and the constraints under which it must operate. For example, this document. |
| Tutorial | A period of tuition given to an individual or very small group or user. |
| Market Price | The market price is the current price at which an asset or service can be bought or sold. |
| Advertiser | Person who places an adv with IRRS. |
| Database | Collection of all the information monitored by this system. |
| IRRS | Indian Railway Reservation System. |

# Appendix B: Design Diagrams

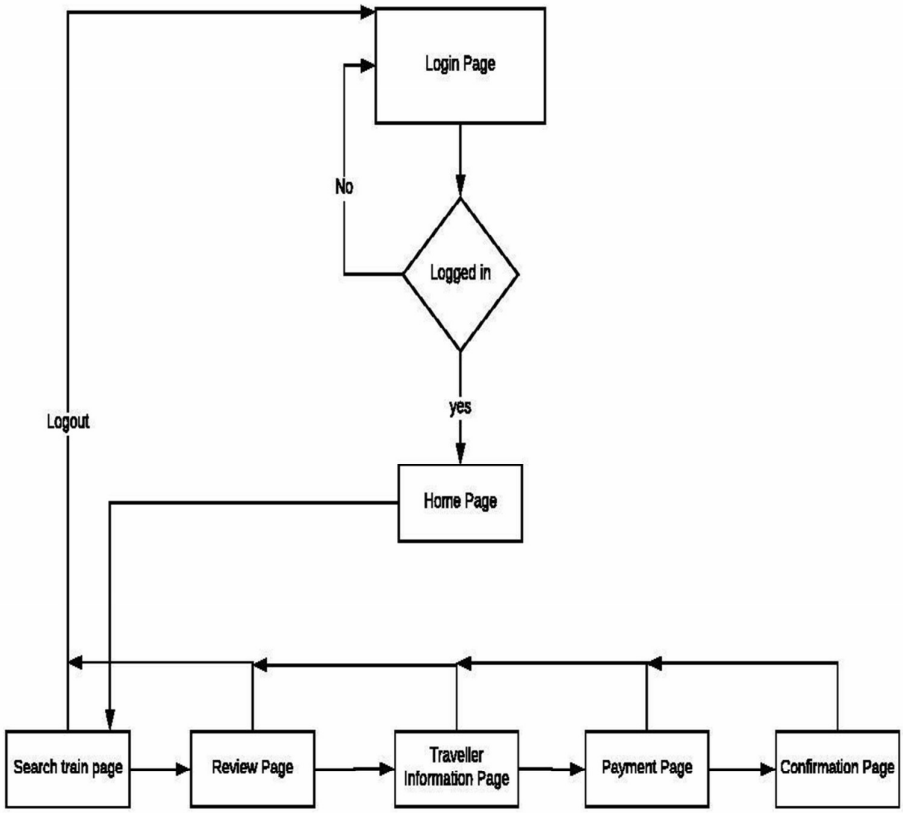
## UML DIAGRAMS

### 1. USE-CASE DIAGRAM

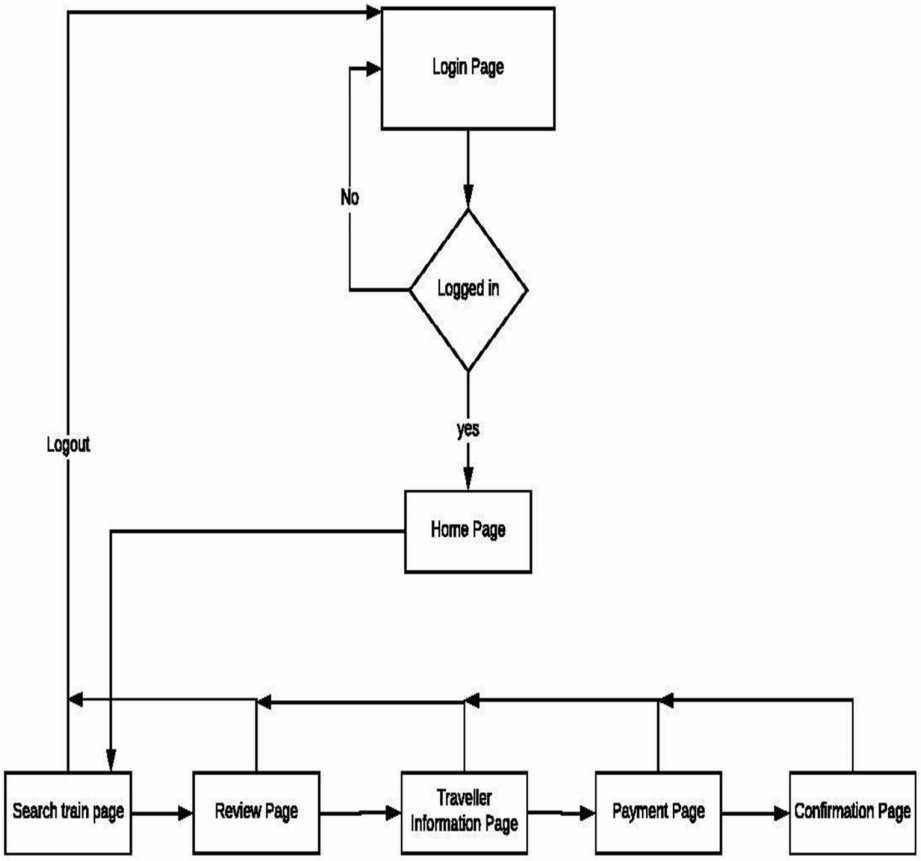


# 2. NAVIGATION DIAGRAMS

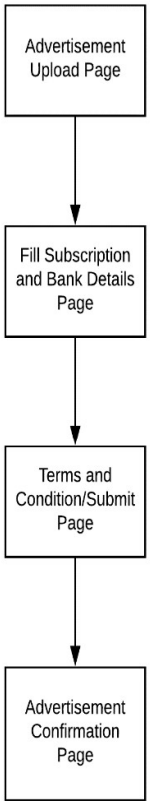
a. Existing Member



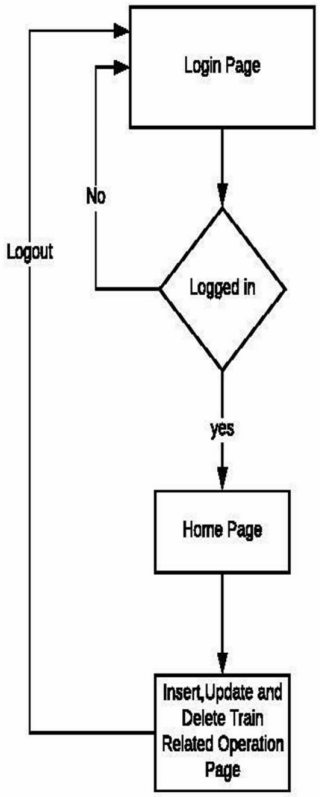
b. Booking Agent



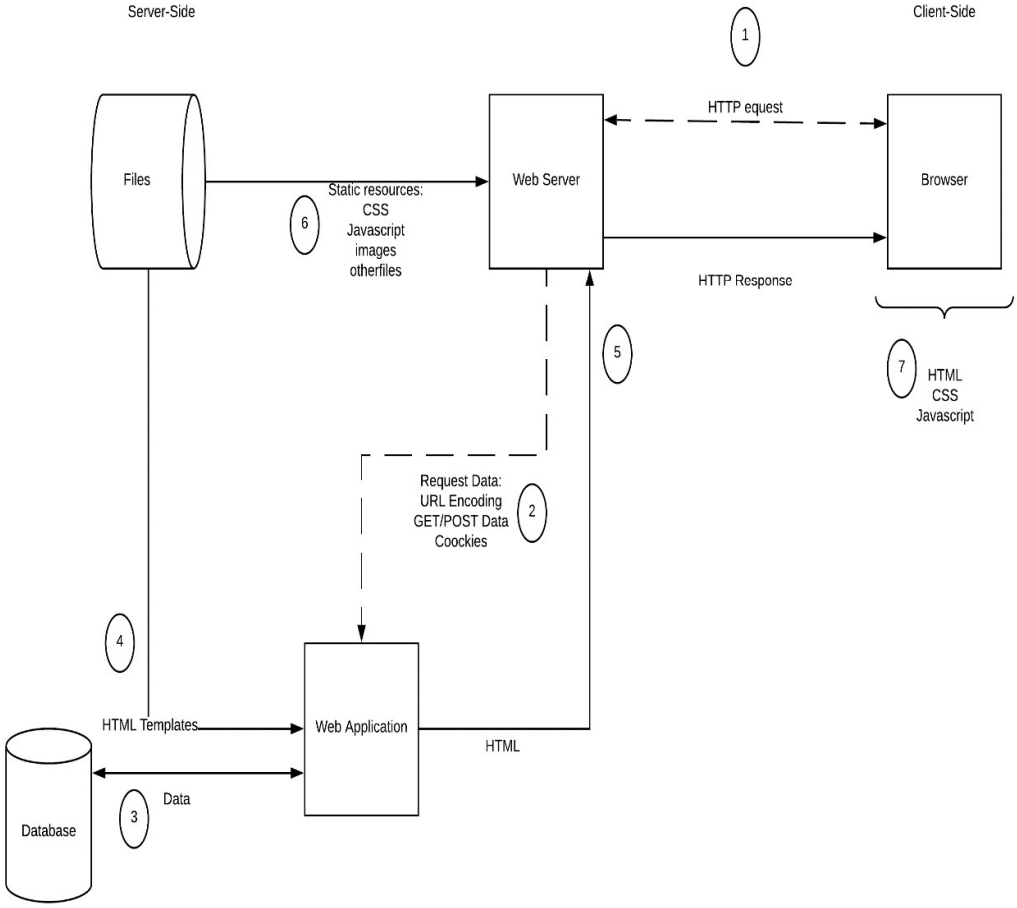
c. Advertiser



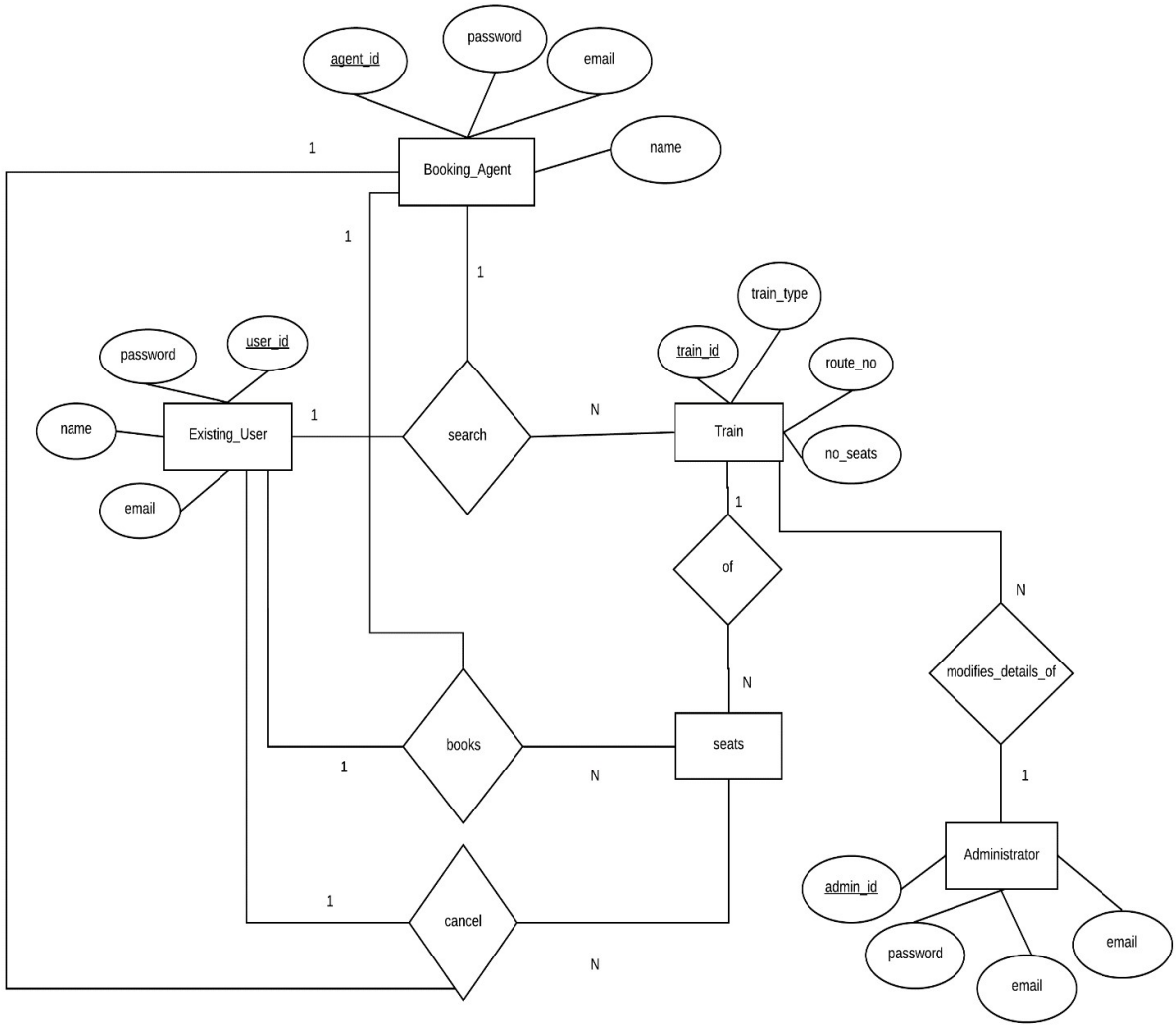
d. Administrator



# 3. System Architecture Diagram

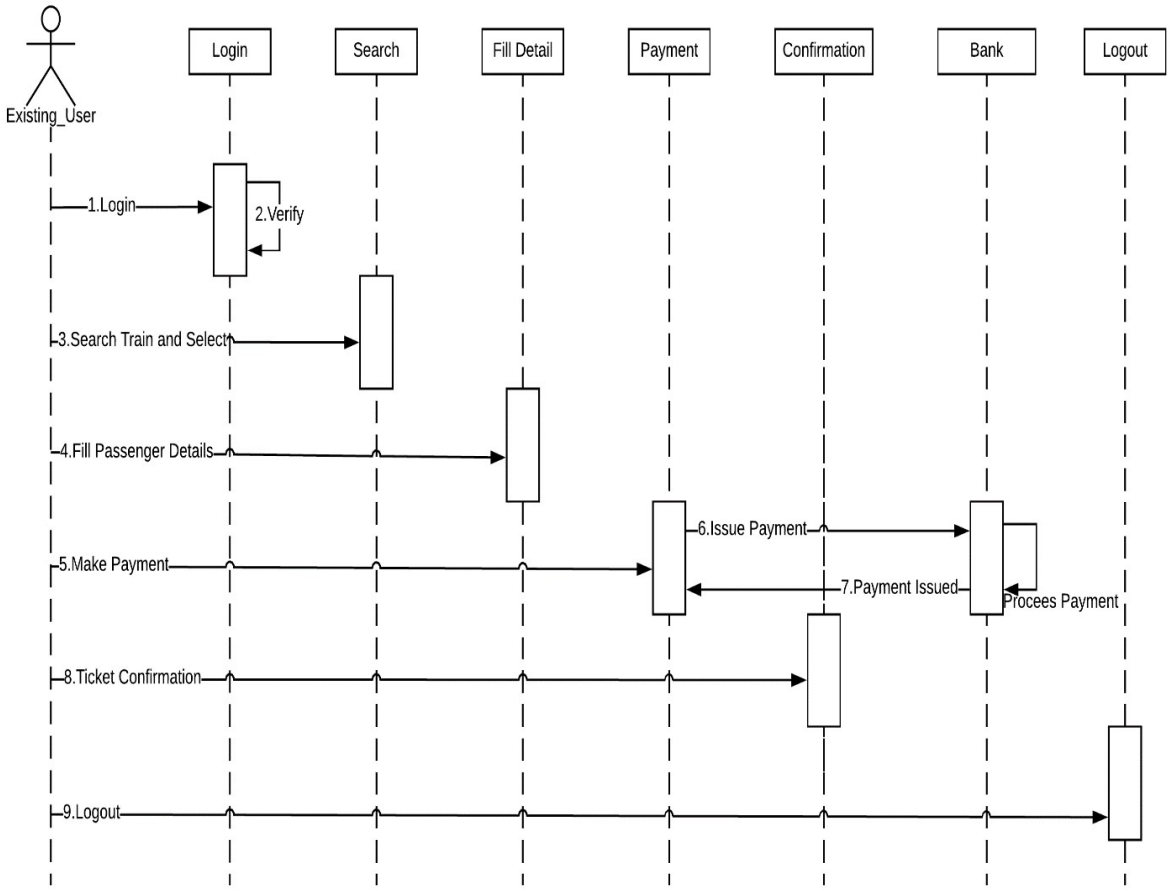


# 4. ER-Diagram

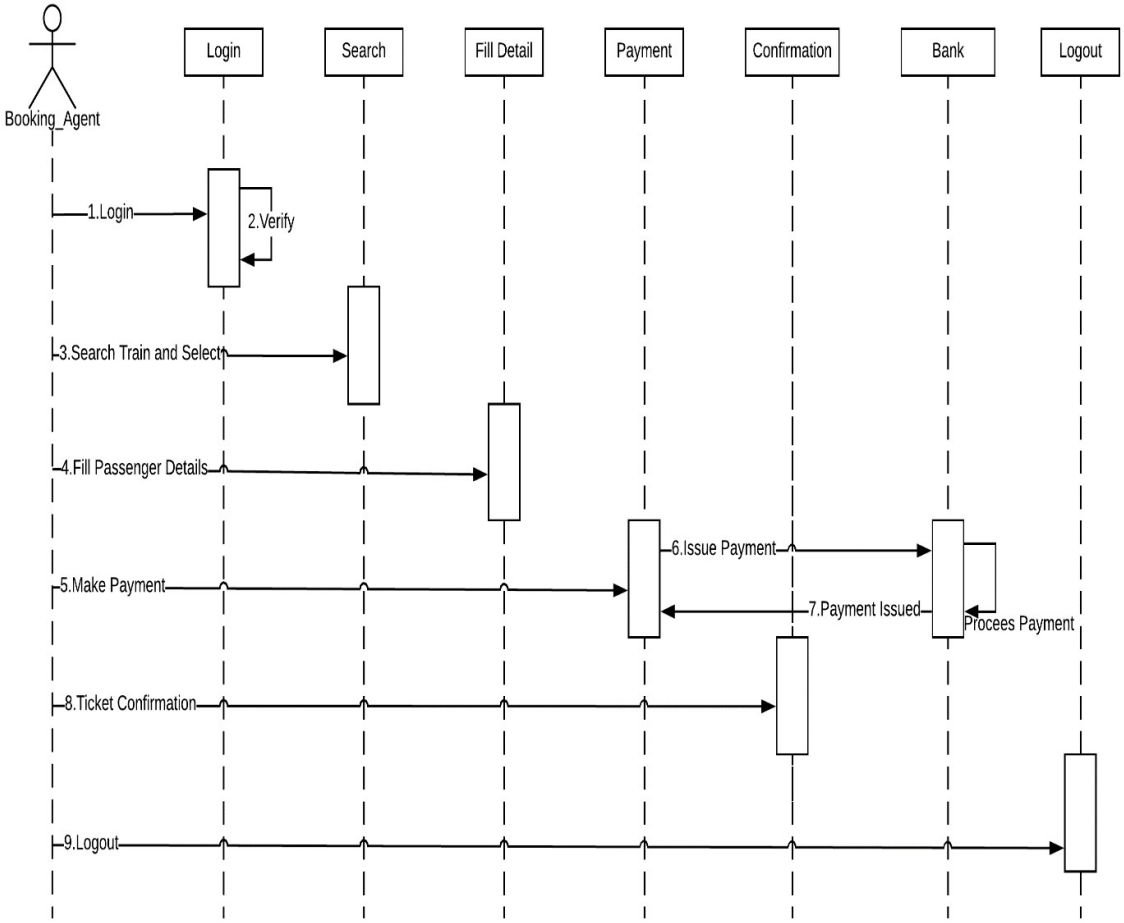

agent_id
password
email
name
Booking_Agent
1
1
1
password
user_id
name
Existing_User
email
search
N
train_type
train_id
route_no
Train
no_seats
1
of
N
N
modifies_details_of
1
books
seats
1
N
1
cancel
N
Administrator
admin_id
password
email
email

# 5. Sequence Diagram

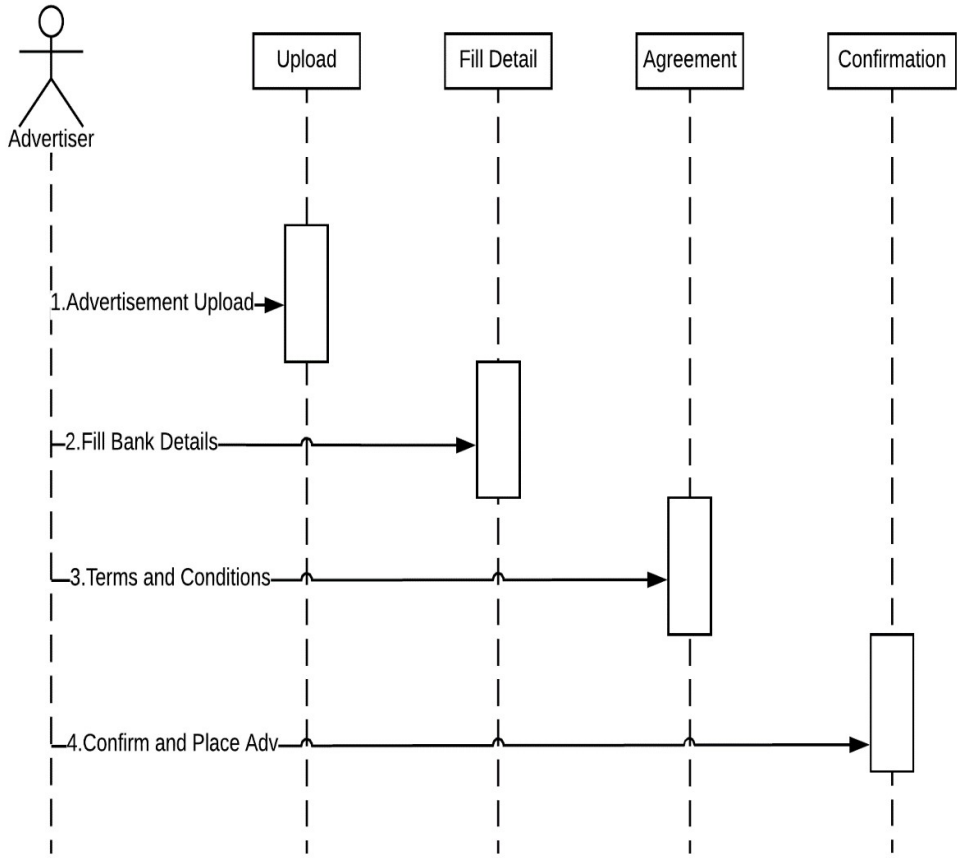
a. Existing User



b. Booking Agent

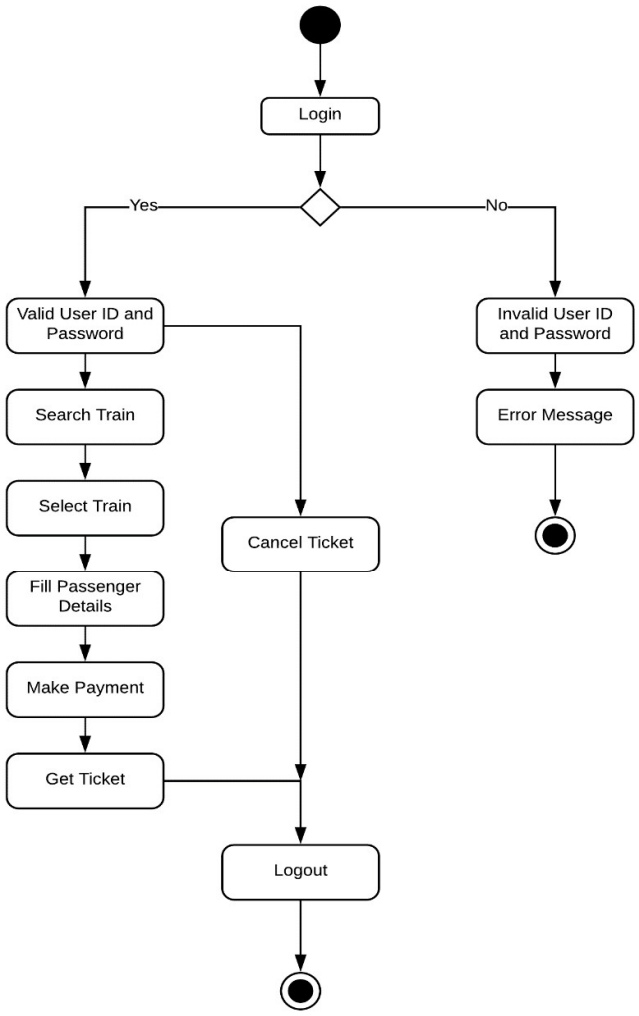


c. Advertiser

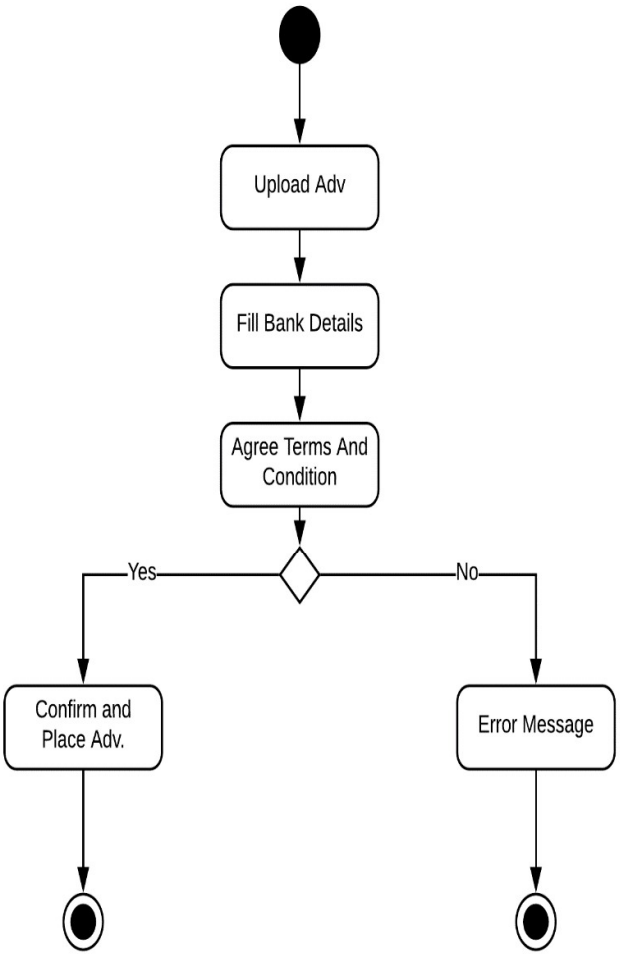


## 6. Activity Diagram

a. Existing user/Booking Agent



b. Advertiser



c. Administrator