# Project Deliverable1 Document

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## 1.1 System Planning

**a. Business Case:**

The Train Ticket Booking App is developed to provide a convenient and hassle-free experience for booking train tickets. With the increasing number of people using trains for travel, this app aims to streamline the ticket booking process and make it accessible from anywhere and anytime. The app will be user-friendly, allowing users to search and book train tickets easily.

**b. SWOT Analysis:**

Strengths:

- Easy and convenient booking process.
- Provides real-time information on train schedules and availability.
- Ability to purchase tickets through the app.

Weaknesses:

- Dependency on the internet to use the app.
- Limited availability of train routes.
- Competition from other ticket booking apps.

Opportunities:

- Ability to expand the app to include other modes of transportation.
- Increase revenue through commission on ticket sales.
- Integration with other travel apps.

Threats:

- Economic instability and fluctuations in demand for travel.
- Emergence of new ticket booking apps.
- Changes in government policies and regulations.

**c. Constraints:**

- The app must be compatible with a range of mobile devices and operating systems.
- The app must adhere to privacy and security regulations.
- The app must be able to handle a large volume of users and transactions.

**d. Feasibility:**

The Train Ticket Booking App is feasible as it solves a common problem faced by travelers and provides a convenient solution. The app is technically feasible as the required technologies and resources are readily available. The app is financially feasible as revenue can be generated through commission on ticket reservation.

**e. Project Management:**

The project will follow an Agile methodology, with regular sprints and iterations. A project manager will oversee the development process, and a team of developers, designers, and testers will work together to create the app.

# 1.2 System Analysis

**a. Fact Finding and answer the following questions:**

- Who: Train travelers.
- What: A mobile app for booking train tickets.
- Where: Anywhere.
- When: Anytime.
- How: Through a user-friendly mobile app.
- Why: To make the train ticket booking process convenient and hassle-free.
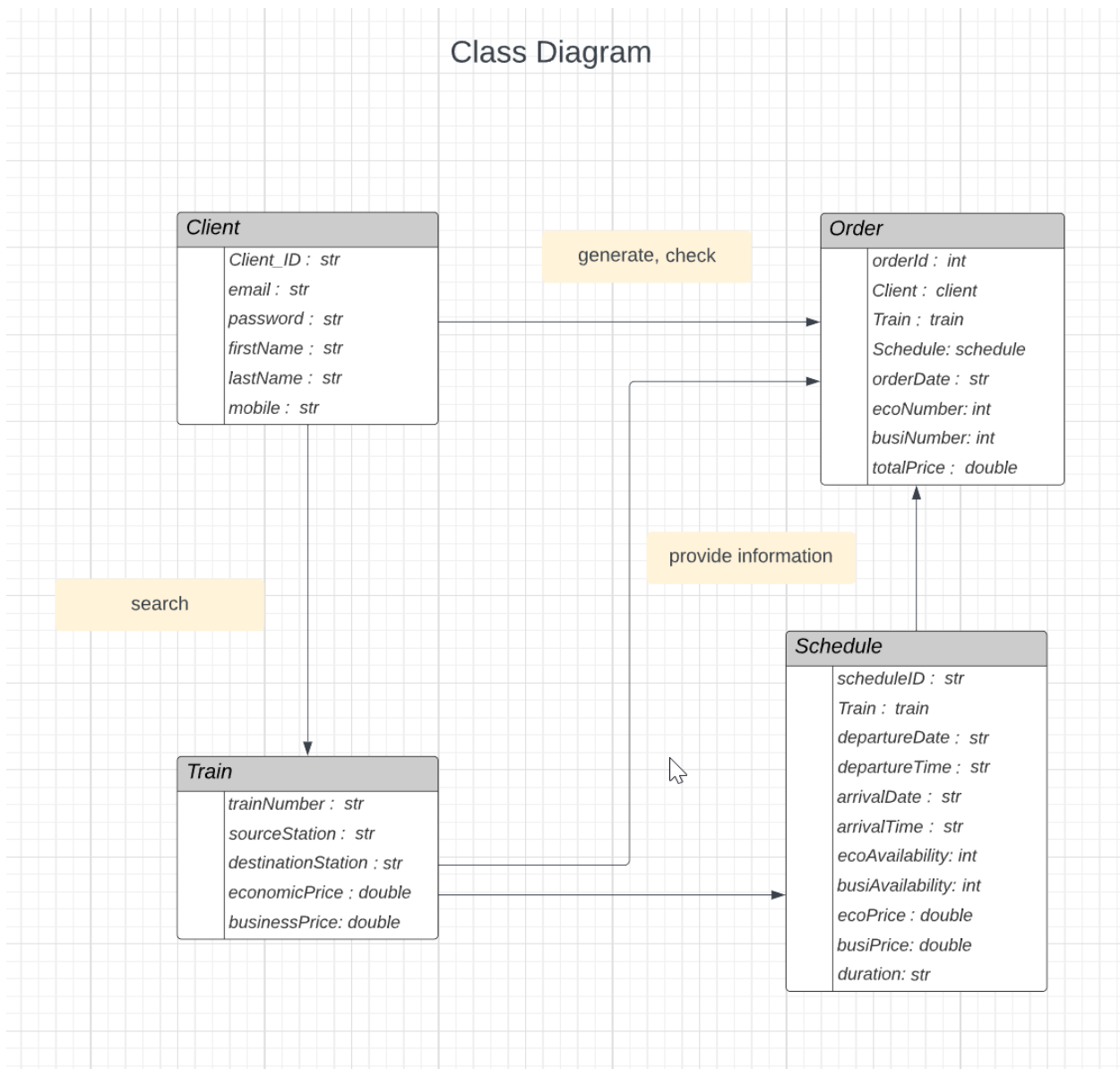
**b. Requirement Modeling:**

- Outputs: Train ticket bookings.
- Inputs: User details and travel information.
- Processes: Search and booking of train tickets.
- Performance: Quick and efficient ticket booking process.

**c. Data and Process Modeling as in Structured Analysis:**

Data modeling will include the creation of a data dictionary, and process modeling will include the creation of a data flow diagram.

- Class/ Object Diagram:

## Class Diagram

**Client**

| |
|---|
| Client_ID : str |
| email : str |
| password : str |
| firstName : str |
| lastName : str |
| mobile : str |

generate, check

**Order**

| |
|---|
| orderId : int |
| Client : client |
| Train : train |
| Schedule: schedule |
| orderDate : str |
| ecoNumber: int |
| busiNumber: int |
| totalPrice : double |

provide information

search

**Train**

| |
|---|
| trainNumber : str |
| sourceStation : str |
| destinationStation : str |
| economicPrice : double |
| businessPrice: double |

**Schedule**

| |
|---|
| scheduleID : str |
| Train : train |
| departureDate : str |
| departureTime : str |
| arrivalDate : str |
| arrivalTime : str |
| ecoAvailability: int |
| busiAvailability: int |
| ecoPrice : double |
| busiPrice: double |
| duration: str |

- Use Case Diagram:

# Use case diagram

**System**

Register and Login

Check train schedule

*provide information*

Book train ticket

Manage user information

*generate orders*

Manage orders

Client

Admin

- State Diagram:

**State Diagram**



Client  searchSchedule  Train

getTrainDetail()

bookTicket(seatNumber)

updateSeatAvailability(seatNum)

Schedule

makeOrder(order)

calculateTotalPrice()

generateETicket()

Order  Admin
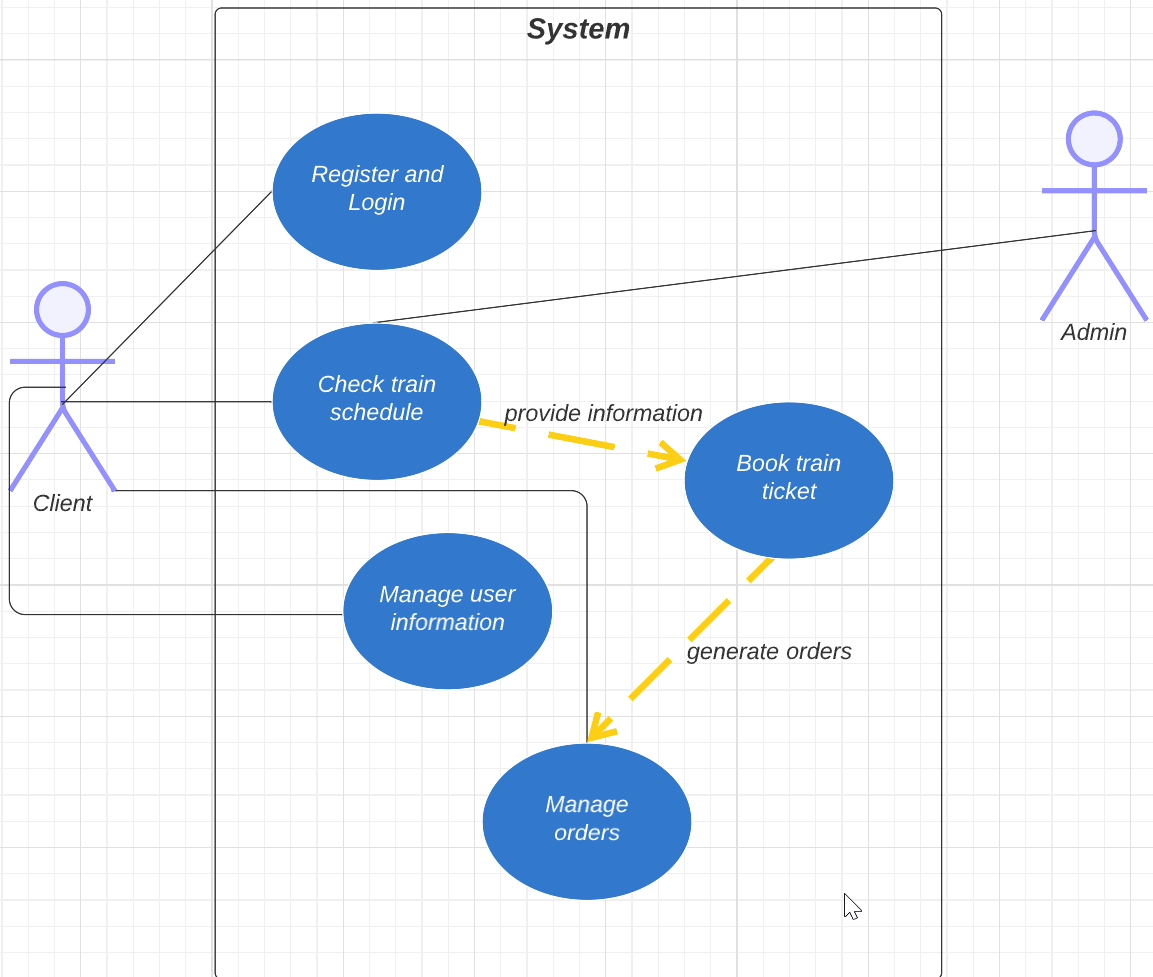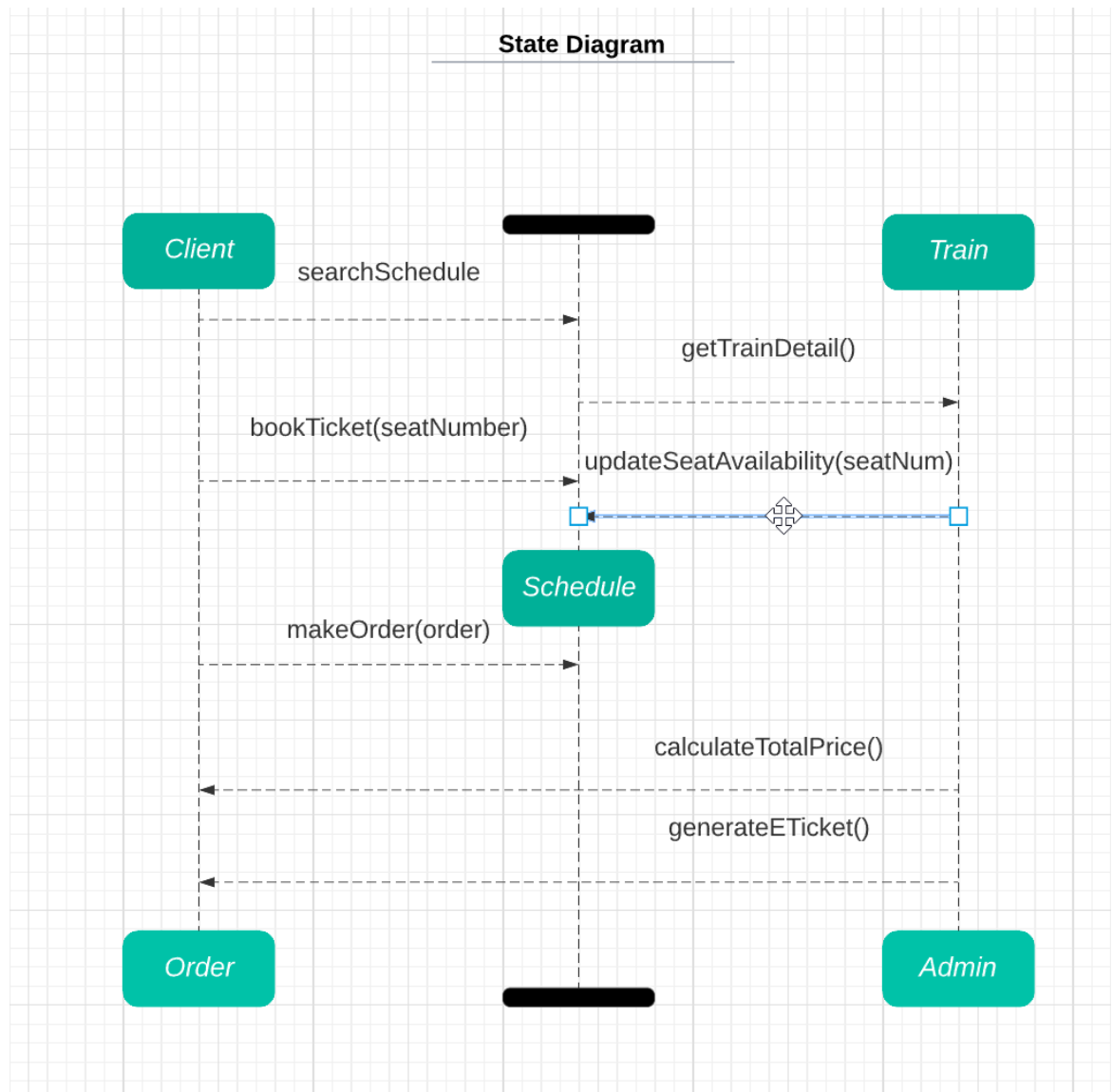
- Data Dictionaries: All data attributes name are very straight-forward.

# 1.3 System Design

**a. Development Strategies:**

The app will be designed using a blueprint mobile app design approach.

**b. System Design for Prototyping:**

The first prototype will include a physical design for the user interface, data storage, and architecture.

    i.       User Interface Considerations: The user interface will be designed to be intuitive and user-friendly.

    ii.      Data Considerations: The app will be designed to store and retrieve data efficiently.

    iii.     Architecture Considerations: The app will be designed to be scalable and easy to maintain.

### c. Output Design:

The app will provide visual output to users in the form of train schedules and ticket bookings.

    i.       Exception Reports: The app will provide notifications for exceptions such as ticket soldout.

    ii.      Summary Reports: The app will provide a summary of the user's travel itinerary.

### d. User Interface Design:

The user interface will be designed to be visually appealing and user-friendly, with clear labeling and instructions. The interface will be intuitive and easy to navigate, with a consistent design and layout across all screens.
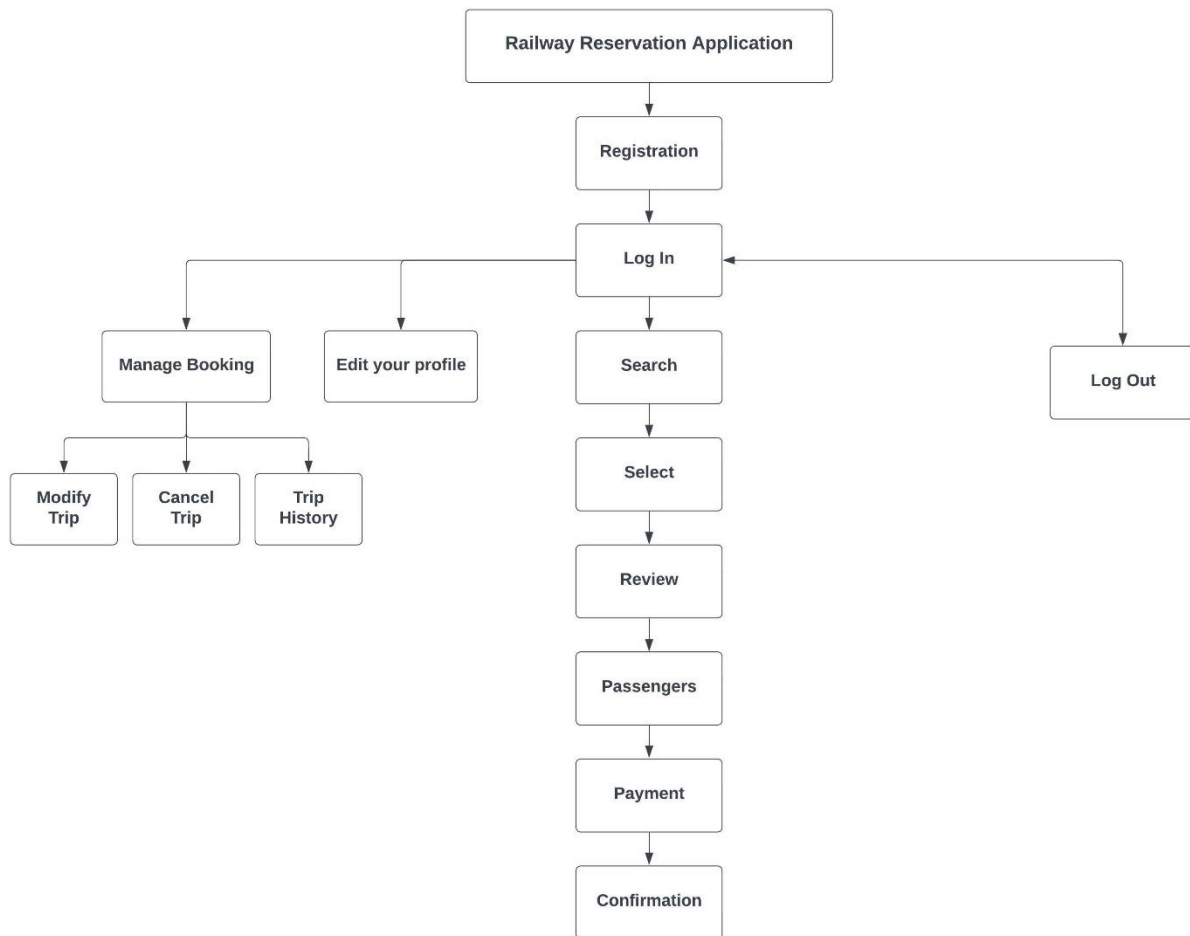
### e. Data Design:

The mobile app will use a data structure that allows for efficient storage and retrieval of user data. Data will be stored in a file system or database system, depending on the specific needs of the app.

    i.       **Use Data Structure:** The app will use a data structure that allows for easy organization and retrieval of user data, such as a hierarchical or relational database.

    ii.      **File System:** The app will use a file system to store user data, allowing for easy backup and recovery of data in the event of a system failure.

    iii.     **Database System:** The app will use a database system to manage user data, allowing for efficient insertion, deletion, and updating of data. The app will also allow for querying of the database to retrieve output data, such as travel plans and reservations.

## 1.4. System Implementation

## a. System Architecture:



## b. System Construction by now:

## Edit information

test1@gmail.com

First Name: Test1

Last Name: GoGo

Mobile: 5556667777

CONFIRM

RETURN

Account updated successfully

## Train Tribe

test1@gmail.com

........

LOGIN

REGISTER

## Edit information

test1@gmail.com

First Name: Test1

Last Name: Luck

Mobile: 1112223333

CONFIRM

RETURN

Leaving from:

Enter the name of the city or station

Departure Date:

2023-05-06

Going to:

Enter the name of the city or station

SEARCH

RETURN

## Search results

**Train Num: 123**
Departure: Toronto
Arrival: Montreal
Departure Date: 2023-05-06
Departure Time: 08:00
Duration: 8 hrs 0 m
Economy Price: $50.00
Business Price: $100.00
Economy Availability: 100
Business Availability: 50

**Train Num: 123**
Departure: Toronto
Arrival: Montreal
Departure Date: 2023-05-07
Departure Time: 08:00
Duration: 8 hrs 0 m
Economy Price: $50.00
Business Price: $100.00
Economy Availability: 50
Business Availability: 20

**Train Num: 456**
Departure: Vancouver
Arrival: Calgary

RETURN BUTTON

---

## Search Page

Leaving from:

Enter the name of the city or station

Departure Date:

2023-05-06

Going to:

Enter the name of the city or station

**SEARCH**

**RETURN**

## Search results

Business Price: $150.00
Economy Availability: 77
Business Availability: 30

**Train Num: 789**
Departure: Toronto
Arrival: Ottawa
Departure Date: 2023-05-08
Departure Time: 09:00
Duration: 3 hrs 0 m
Economy Price: $80.00
Business Price: $160.00
Economy Availability: 57
Business Availability: 40

**Train Num: 789**
Departure: Toronto
Arrival: Ottawa
Departure Date: 2023-05-09
Departure Time: 09:00
Duration: 3 hrs 0 m
Economy Price: $80.00
Business Price: $160.00
Economy Availability: 38
Business Availability: 19

**RETURN BUTTON**

**Train Num: 456**

Departure: Vancouver

Arrival: Calgary

Departure Date: 2023-05-07

Arrival Date: 10:00

Duration: 5 hrs 0 m

Economy Price: 75.0

Business Price:  150.0

Economy Availability: 77

Business Availability: 30

Enter the number of economy tickets you want

Enter the number of business tickets you want

**CONFIRM BOOKING**

**RETURN TO SEARCH**

**Screen 1 (Train Tribe):**

Train Num: 789
Departure: Toronto
Arrival: Ottawa
Departure Date: 2023-05-09
Arrival Date: 09:00
Duration: 3 hrs 0 m
Economy Price: 80.0
Business Price: 160.0
Economy Availability: 40
Business Availability: 20

Enter the number of economy tickets you want

Sorry you need to book at least 1 ticket to make an order

Enter the numb... want

CONFIRM BOOKING
RETURN TO SEARCH

**Screen 2 (Train Tribe):**

Train Num: 789
Departure: Toronto
Arrival: Ottawa
Departure Date: 2023-05-09
Arrival Date: 09:00
Duration: 3 hrs 0 m
Economy Price: 80.0
Business Price: 160.0
Economy Availability: 40
Business Availability: 20

jgjjf

Please enter a valid number

1

CONFIRM BOOKING
RETURN TO SEARCH

**Screen 3 (Train Tribe):**

Train Num: 789
Departure: Toronto
Arrival: Ottawa
Departure Date: 2023-05-09
Arrival Date: 09:00
Duration: 3 hrs 0 m
Economy Price: 80.0
Business Price: 160.0
Economy Availability: 38
Business Availability: 19

8888

Sorry, only 38 economy tickets are available.

Enter the num... want

CONFIRM BOOKING
RETURN TO SEARCH

**Screen 4 (Train Tribe):**

Train Num: 456
Departure: Vancouver
Arrival: Calgary
Departure Date: 2023-05-07
Arrival Date: 10:00
Duration: 5 hrs 0 m
Economy Price: 75.0
Business Price: 150.0
Economy Availability: 77
Business Availability: 30

7

Enter the number of business tickets you want

CONFIRM BOOKING
RETURN TO SEARCH

**Screen 5 (Train Tribe):**

Train Num: 456
Departure: Vancouver
Arrival: Calgary
Departure Date: 2023-05-07
Arrival Date: 10:00
Duration: 5 hrs 0 m
Economy Price: 75.0
Business Price: 150.0
Economy Availability: 70
Business Availability: 30

Order confirmed, you have ordered 7 eco tickets and 0 busi tickets.

Total billing: $525.0

CONFIRM BOOKING
RETURN TO SEARCH

Booking confirmed

**Deliverable3（edit user information, check train schedule）**

**Screen 1:**

Train Tribe

Train Tribe

Email
Password

LOGIN
REGISTER

**Screen 2:**

Register

springfield2023@gmail.com
........
.........

Passwords do not match

Bart
Simpson
5149797979

CONFIRM
RETURN

**Screen 3:**

Register

spicefriday@hotmail.com

Sorry, this email is already registered.

........
........
Bart
Simpson
5149797979

CONFIRM
RETURN

**Screen 4:**

My Account

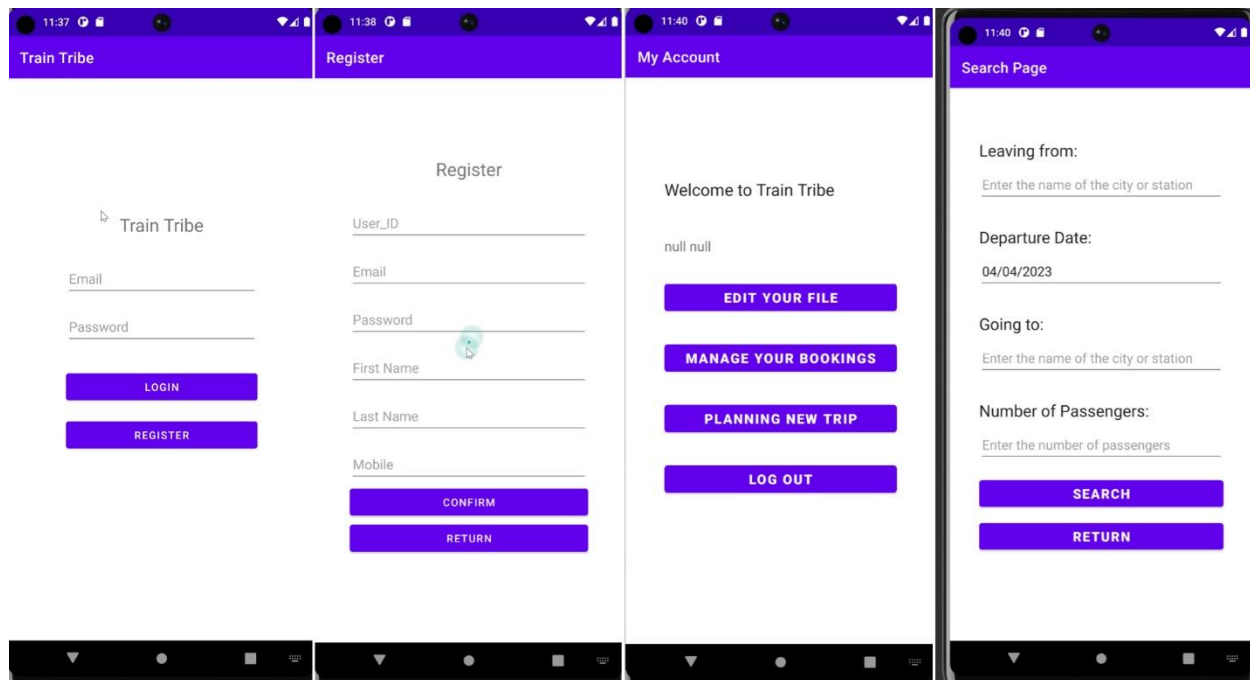Welcome to Train Tribe

Bart Simpson

EDIT YOUR FILE
MANAGE YOUR BOOKINGS
PLANNING NEW TRIP
LOG OUT

**Deliverable2**

**Deliverable1**

<mark>I've also done the layout-landscape accordingly, for more details, please check my attached android files to check the source codes.</mark>

## 1.5. System Testing

**a. Unit Testing:**

In this phase, individual components of the system are tested in isolation to ensure they function correctly. The main goal is to verify that each unit of the software performs as designed. The unit testing process should cover all code paths and should include both positive and negative test cases.

**b. Integration Testing:**

This phase involves testing the interaction between different components of the system. The goal is to verify that the various components of the system work together as expected. Integration testing can be done at various levels such as module integration, subsystem integration, and system integration.

**c. System Testing:**

This phase involves testing the system as a whole to ensure that it meets the specified requirements. The testing should cover all aspects of the system, including functional and non-functional requirements. System testing should be done with realistic data and scenarios to simulate real-world usage. The main goal of system testing is to identify defects that could impact the system's overall performance or functionality.