Railway Reservation System

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1.INTRODUCTION

A Software Requirements Specification (SRS) is a document that describes the nature of a project, software or application. In simple words, an SRS document is a manual of a project provided it is prepared before you kick-start a project/application. This document is also known by the names SRS report, or software document. A software document is primarily prepared for a project, software, or any kind of application There are a set of guidelines to be followed while preparing the software requirement specification document. This includes the purpose, scope, functional and non-functional requirements, and software and hardware requirements of the project. In addition to this, it also contains information about environmental conditions required, safety and security requirements, software quality attributes of the project, etc.

The railway reservation system facilitates the passengers to enquiry about the trains available on the basis of source and destination, booking and cancellation of tickets, enquiry about the status of the booked ticket, etc. The aim of case study is to design and develop a data base maintaining records of different trains, train status and passengers. This project contains introduction to the railways reservation system. It is the computerized system of reserving the seats of train seats in advance. It is mainly used for a long route. Online reservation has made the process for the reservation of seats very much easier than ever before.

- Reserving Tickets
- Cancelling Tickets
- Checking the Train details
- Admin privilege to update the records

1.1 Objective:

The objectives of a Railway Reservation System are centred around providing efficient, convenient, and secure services for both passengers and the railway administration. The Software Requirements Specification (SRS) document outlines the objectives, features, and specifications of a software system. Online Railway ticket reservation is very useful nowadays. This is very important to design a good-working system software for ticket booking and related transactions.

1. If a passenger wants to reserve ticket(s), firstly, he/she has to log in to the Railway system with valid credentials. Then, the passenger has to provide his/her details with the date of the journey, names of the passengers and their details, origin station details, destination station details, and the class type of the required ticket(s).
2. The Railway Reservation System will provide the available Train-list, and Seat-availability, via-details.
3. To book a ticket passengers can pay through online/offline mode. After successful payment of the ticket fare the System will generate the ticket and PNR no. will be

given to the passenger. The System also keeps the payment details and sends them to the system Admin.

4. The Passenger can check PNR status (confirmed, RAC, waiting list) by entering the PNR no. into the Reservation system.
5. The Reservation system should store all train details, fare details (by zone, class, and date wise), PNR no, date of trains, etc. This maintenance should be controlled by the Admin.
6. The System also has refund rules which have a date of reservation, ticket fare, and refundable percentage. The passenger can simply cancel the ticket(s) by entering the PNR no and a cancel ticket request. After cancelation, the Admin will pass the refundable amount to the System and the System will give the refundable amount to the passenger.

1.2Scope

The scope of a Railway Reservation System refers to the boundaries and extent of the functionalities, features, and capabilities that the system is intended to encompass. Clearly defining the scope is crucial to ensuring that the development team and stakeholders have a shared understanding of what the system will and will not include.

- Ticket Booking
- Seat Allocation and Reservation
- Cancellation and Refund
- Train Schedule and Information

1.3Glossary

This glossary provides a basic understanding of key terms associated with a Railway Reservation System

- NTES – National Train Enquire System
- IVRS – Interactive Voice Response System
- PRS – Passenger reservation system
- DFD – Data flow Diagram
- ERD – Entity Relational Diagram
- SRS – Software requirement diagram
- STD – State Transition Diagram

1.4Overview

A Railway Reservation System is a comprehensive software application or platform designed to facilitate the booking, management, and administration of railway tickets. It plays a crucial role in modernizing and streamlining the ticketing process for train travel.

2.Overall Descripton

A Railway Reservation System is a comprehensive software application that facilitates the efficient and organized management of railway ticket bookings, seat reservations, and related services. This system is designed to automate and streamline the process of ticket reservation for passengers, providing a convenient and user-friendly interface for both customers and railway administrators.

2.1 Product Perspective:

A Railway Reservation System is a complex and multifaceted software solution designed to address the needs and requirements of both passengers and railway administrators. Here's an overview of the product perspective

- The system should offer an intuitive and user-friendly interface for passengers to easily search for trains, check seat availability, and make reservations. Simultaneously, the admin interface must be designed to streamline administrative tasks.
- The system needs to be scalable to accommodate a large number of users, especially during peak booking periods or when there is an increased demand for certain routes.
- Compatibility with various devices and platforms is crucial. The system should support web browsers, mobile applications, and other interfaces to ensure accessibility for a diverse user base.
- The product must be reliable and available 24/7, as users may want to book tickets at any time. System downtime should be minimized to ensure uninterrupted service.
- Seamless integration with different payment gateways is essential to support a variety of payment methods, ensuring a smooth and secure transaction process for users

2.2 Project Function

The Railway Reservation System facilitates the passengers to enquire about the trains available on the basis of source and destination, Booking and Cancellation of tickets, enquire about the status of the booked ticket, etc. The functions of a Railway Reservation System can be categorized into several key areas, encompassing both passenger-facing features and administrative capabilities. Here's a breakdown of the project functions for a Railway Reservation System

User Registration and Authentication:

- Allow users to create accounts with secure authentication mechanisms. Store and manage user profiles securely.

Train Schedule Management:

- Add, update, and delete train schedules, including details such as departure and arrival times, stations, and routes.

2.3 User Characteristics

- The Railway Reservation System will provide the available Train-list, and Seat-availability, via-details.
- To book a ticket passengers can pay through online/offline mode. After successful payment of the ticket fare the System will generate the ticket and PNR no. will be given to the passenger.

2.4 Constrains:

Technology Constraints:

- Compatibility with existing railway infrastructure and systems.
- Adherence to technology standards and protocols in the railway industry.

Security Constraints:

- Implementation of robust security measures to protect against cyber threats and unauthorized access.
- Compliance with industry standards for secure online transactions.

Data Integrity Constraints:

- Ensuring the accuracy and integrity of data stored within the system.
- Implementing measures to prevent data corruption or loss.

2.5 Assumptions and Dependencies:

- Users have reliable internet connectivity to access the online reservation system. Assumption: Users can connect to the system without significant network disruptions
- Online payment gateways and banking systems function without major disruptions. Assumption: Smooth processing of financial transactions through integrated payment gateways.
- Train schedules provided by the railway operators are accurate and regularly updated. Assumption: Timely availability and accuracy of train schedule information.

3.Requitrement Specification

3.1 Function Requirement:

These are the requirements that the end user specifically demands as basic facilities that the system should offer. All these functionalities need to be necessarily incorporated into the system as a part of the contract. These are represented or stated in the form of input to be given to the system, the operation performed and the output expected. They are the requirements stated by the user which one can see directly in the final product, unlike the non-functional requirements.

3.1.1 performance requirement:

- User Authentication Speed:- Set requirements for the speed of user authentication processes, ensuring that login and account verification occur promptly.
- Response Time:- The system should have a low response time for user interactions, such as searching for trains, checking availability, and making reservations. Aim for response times of a few seconds to provide a seamless user experience.
- Error Handling Time:- Define the maximum time allowed for the system to identify and handle errors, ensuring prompt resolution and minimal impact on users.

3.1.2 Design constrain:

Design constraints for a Railway Reservation System are limitations or restrictions that impact the design decisions, architecture, and implementation of the system. Identifying and addressing these constraints is essential for creating a robust and effective system. Here are some common design constraints for a railway reservation system

- Security Standards:- Adherence to security standards and protocols to protect user data, financial transactions, and system integrity. This includes compliance with industry-specific security standards.
- Usability and Accessibility:- Ensuring a user-friendly interface and accessibility features to accommodate users with diverse needs and abilities.
- Network Limitations:- Designing considering potential network limitations, especially in areas with slow or unreliable internet connectivity.

3.1.3 Hardware requirements:

The hardware requirements for a Railway Reservation System depend on various factors, including the expected user load, system complexity, and performance goals. Here are general hardware requirements for a scalable and efficient Railway Reservation System

- Windows.
- A browser that supports CGI, HTML & Javascript

3.1.4 Software requirements:

The software requirements for a Railway Reservation System encompass the necessary components and technologies to develop, deploy, and operate the system effectively

- Operating system
- Database
- VB.Net

3.1.5 Other requirements:

These requirements encompass aspects beyond the technical scope and include considerations related to business, user experience, regulations, and more.

- Portability
- Security
- Testing
- Reusability
- Flexibility

3.2 Non-Function Requirements

These are the quality constraints that the system must satisfy according to the project contract. The priority or extent to which these factors are implemented varies from one project to another. They are also called non-behavioral requirements.

3.2.1 Security:

Security requirements ensure there is protection from unauthorized access to the system and its stored data. It considers different levels of authorization and authentication across different user roles. For instance, *data privacy* is a security characteristic that describes who can create, see, copy, change, or delete information. Security also includes protection against viruses and malware attacks.

3.2.2 Reliability:

Reliability defines how likely it is for the software to work without failure for a given time. Reliability decreases because of bugs in the code, hardware failures, or problems with other system components.

3.2.3 Availability

Availability reflects the time that the system’s functionality and services are available for use with all operations. So scheduled maintenance periods directly influence this parameter. And it’s important to define how the impact of maintenance can be minimized. When writing the availability requirements, the team has to define the system's most critical components that must be available at all times.

3.2.4 Maintainability:

A commercial database is used for maintaining the database and the application server takes care of the site. Maintainability is a crucial aspect of software development, ensuring that the Railway Reservation System can be easily updated, enhanced, and fixed over time.

3.3.5 Supportability:

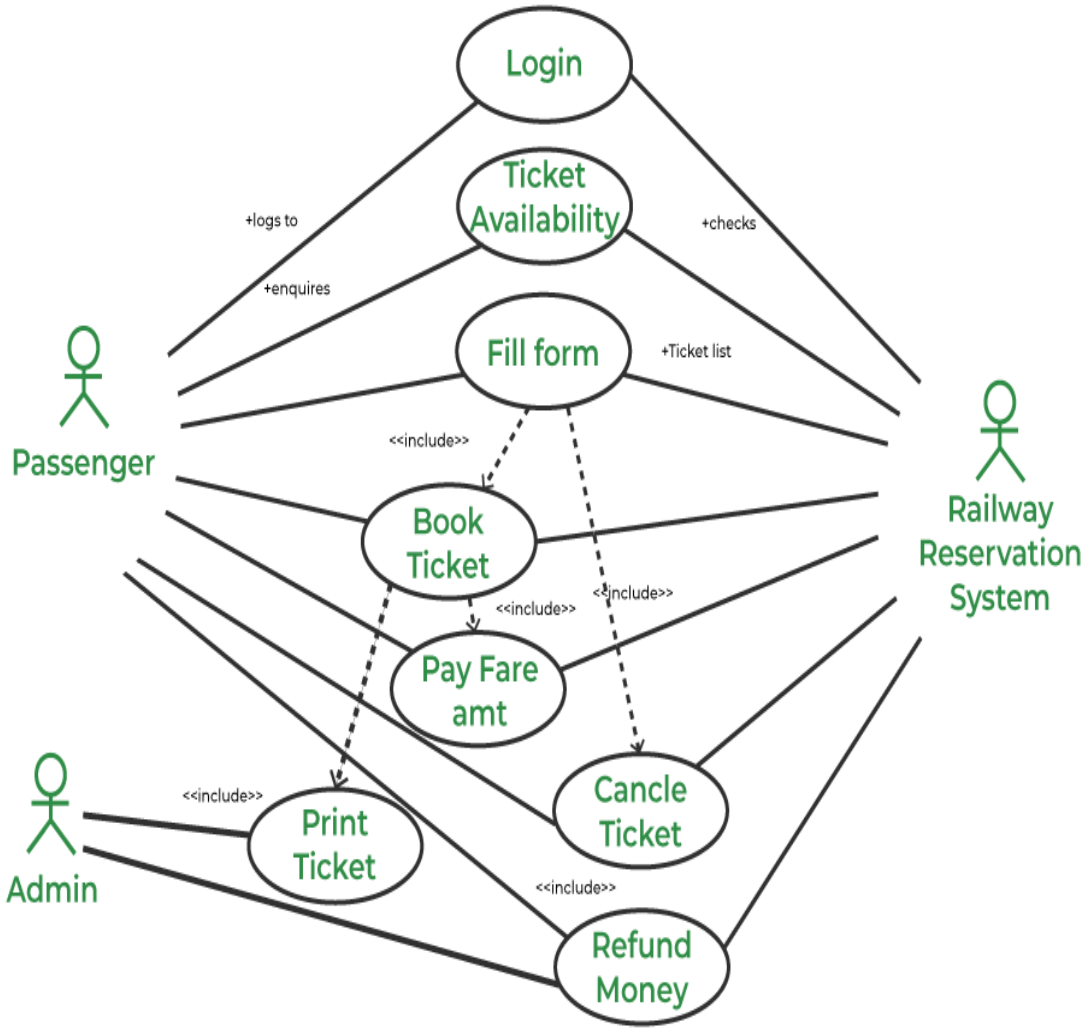
The code and supporting modules of the system will be well documented and easy to understand . Supportability refers to the system's ability to receive timely and effective support, ensuring that it can be maintained, updated, and operated efficiently

4.DIAGRAM

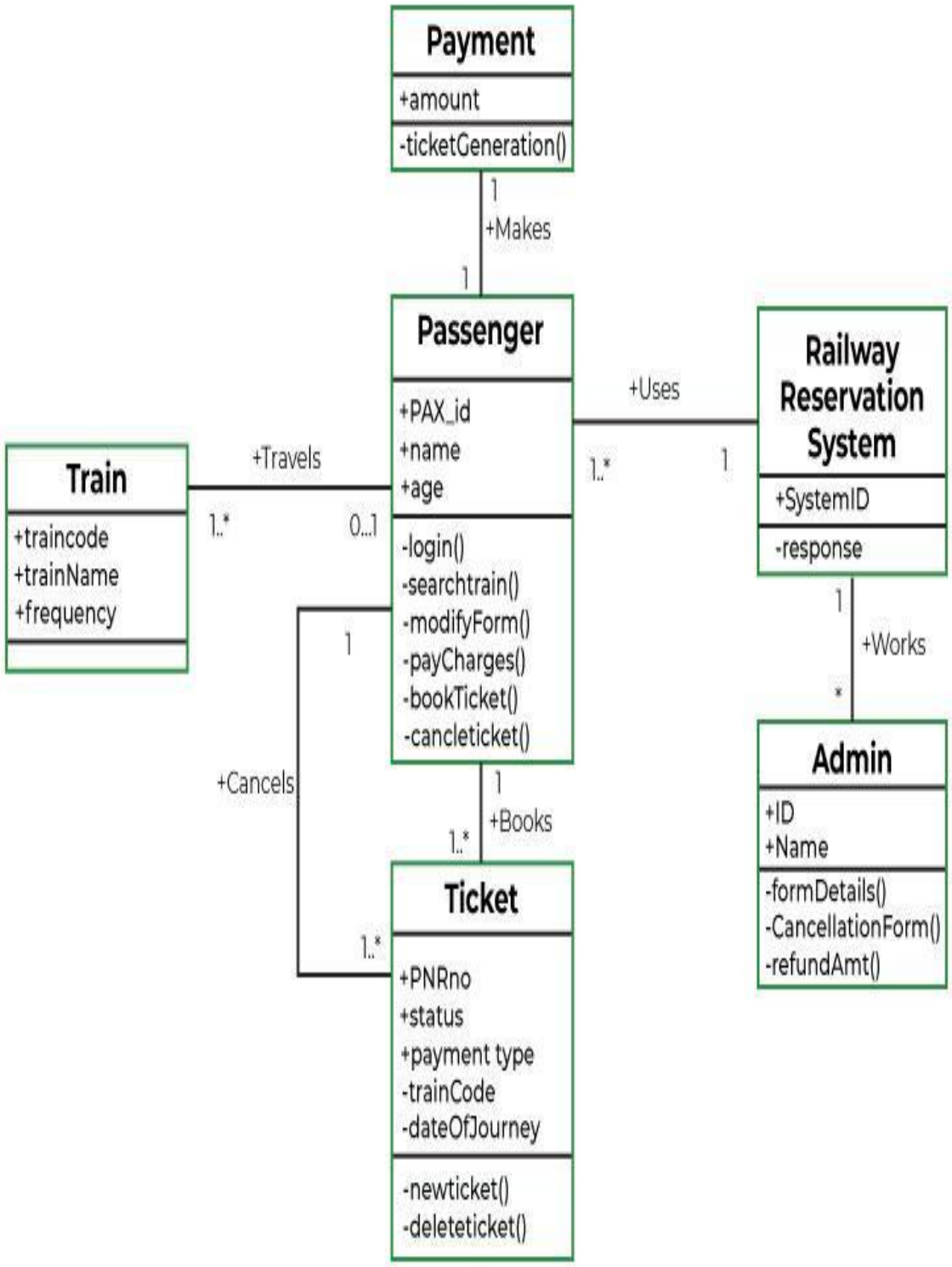
The relationship between the actors and the use cases of the online Railway reservation system is given below–>

1. **Passenger Entity:** Use cases of passengers are login, ticket availability, Filling the form, Book ticket, Canceling ticket, and Refund money.
2. **Railway Reservation System:** Use cases of the Railway Reservation System are login, ticket availability, Fill the form, Book ticket, Cancel ticket, and Refunding money.
3. **Admin:** use cases of Admin are Print ticket, refund money. Admin also controls the whole Railway Reservation System in different cases.

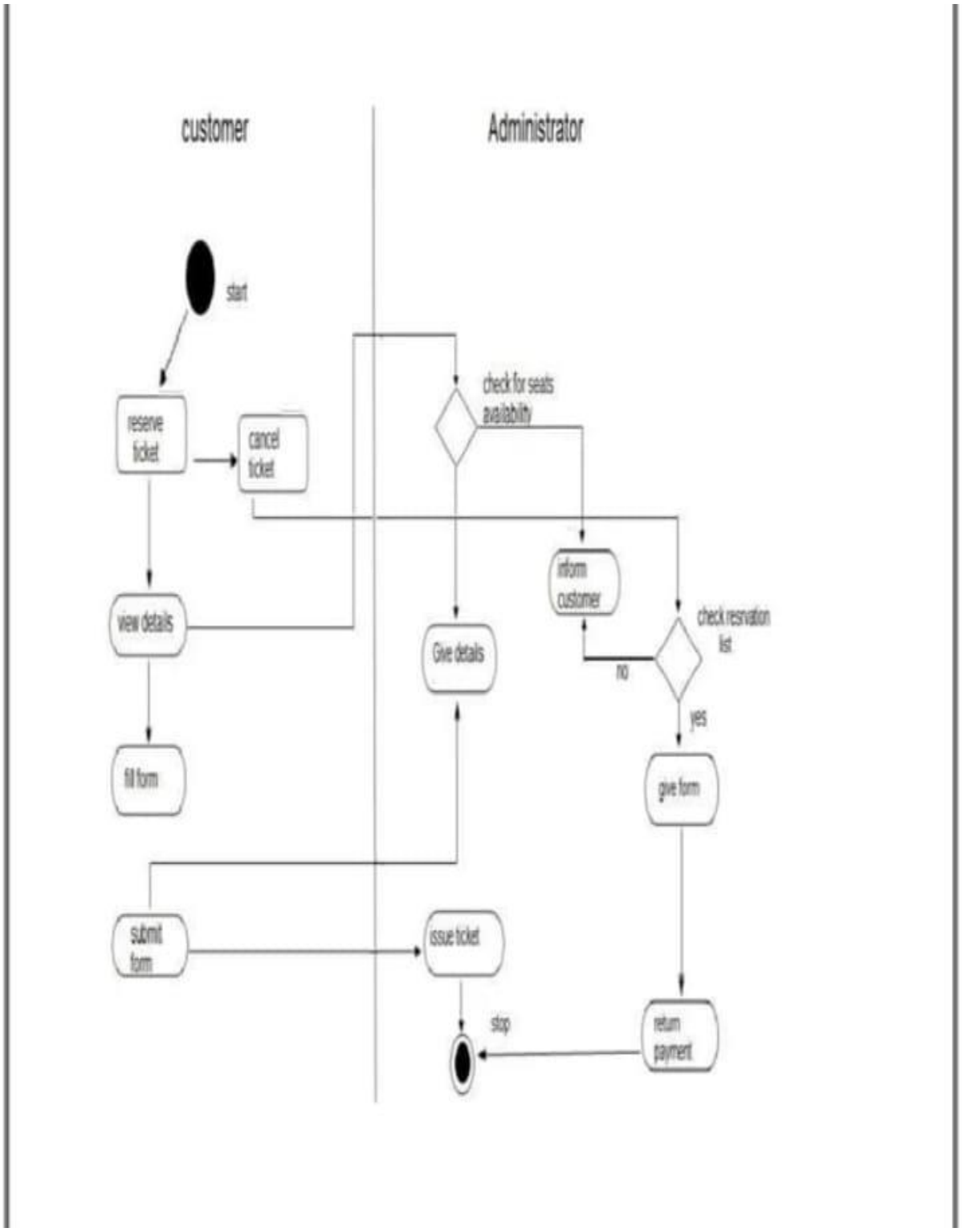
4.1 Use-case Diagram



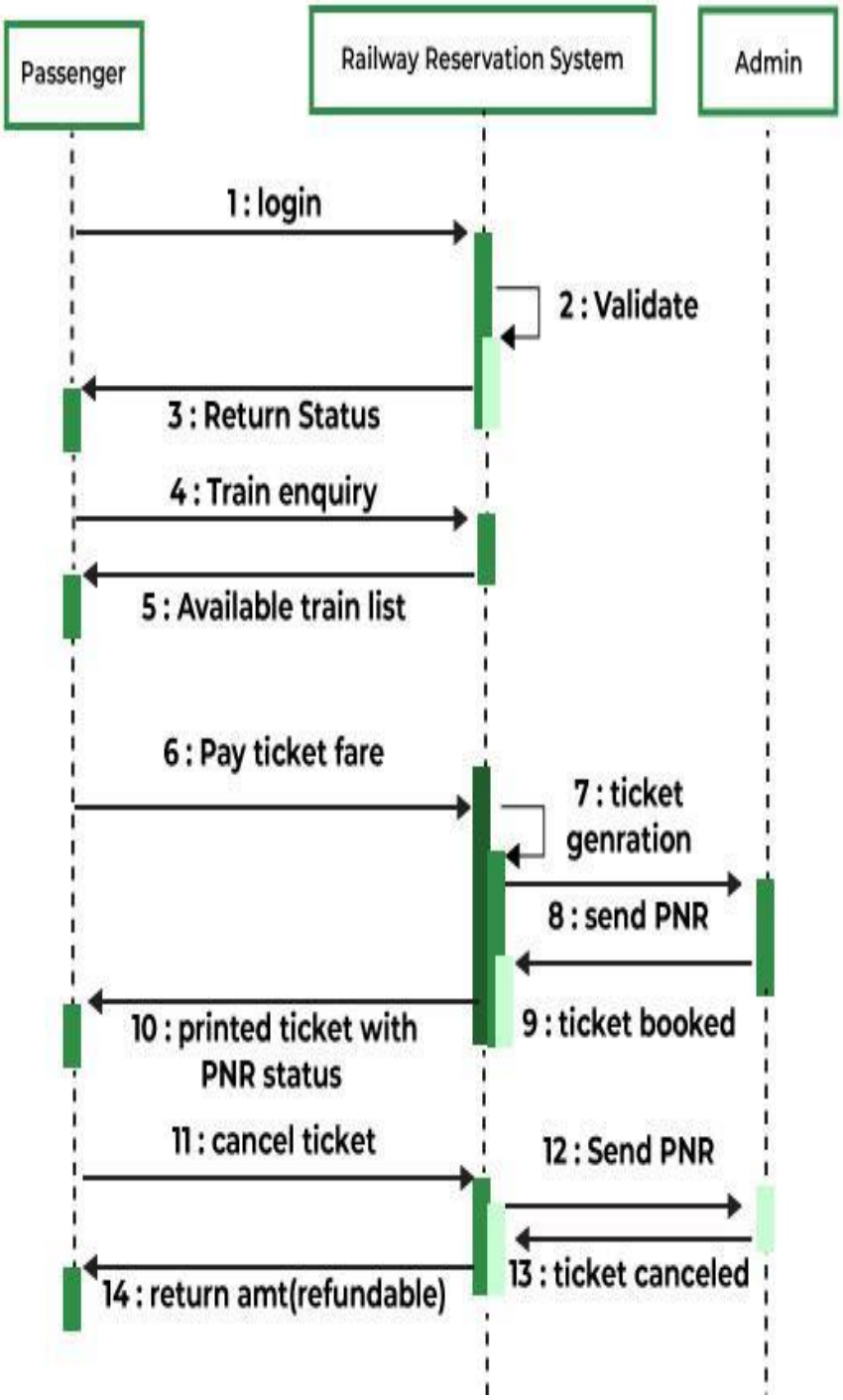
4.2 Class Diagram



4.3 State Diagram:



4.4 Sequence Diagram



4.5 Dataflow Diagram

A Data Flow Diagram (DFD) is a graphical representation of how data flows within a system. It illustrates the processes, data sources, data destinations, data storage, and the flow of data between these components. The **DFD for Railway Reservation System** describes the overall (flow) of data on the project. It is used to document the transformation of data (input-output) for project development.

The **railway reservation system** consists of DFD levels 0, 1, and 2. It also uses **entities**, **processes**, and **data** to define the whole system

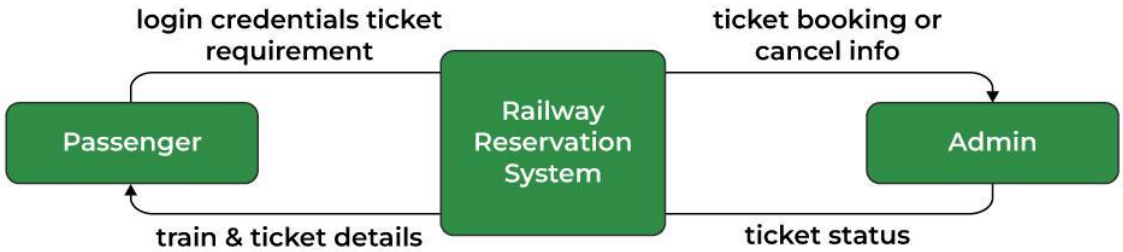
One of the methods used for railway reservation system development is the **DFD (data flow diagram)**. It represents the system's major processes and alternatives that generate the internal flow of data.

Additionally, the data was properly categorized to illustrate the railway reservation system structure. Take note that DFD is not part of the **Railway Reservation System UML Diagrams**, but they complement each other in explaining the project activities, behaviors, interactions, and structure.

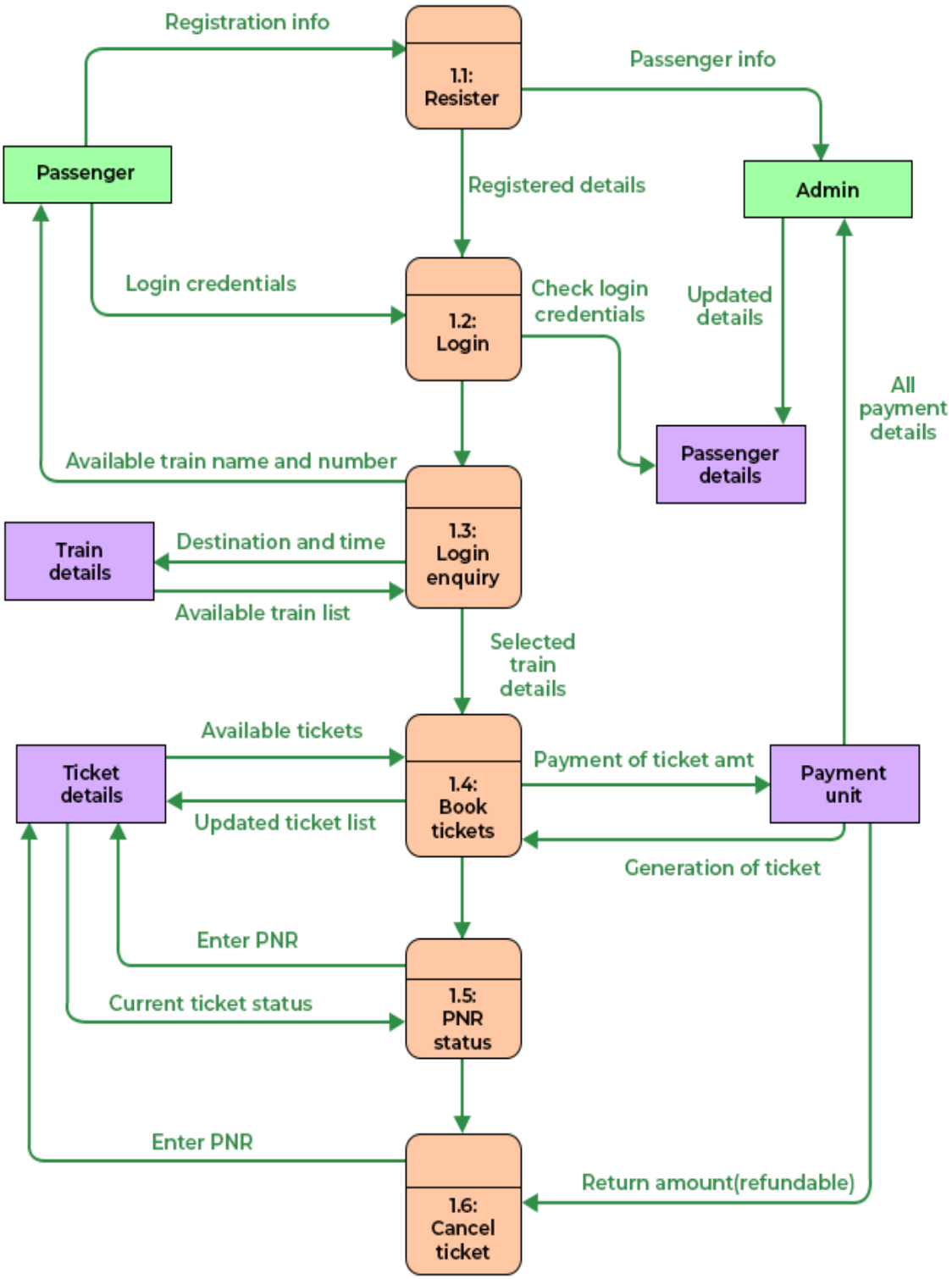
The **importance of the data flow diagram (DFD) for railway reservation system** is to show the developers the actual happenings in the system. This is done by visualizing the system's data management at various levels.

Furthermore, the **DFD levels** were used to discuss the **railway reservation system** data flow. These levels have their part in expounding the system's data flow structure details. It is then applied in creating **Railway Reservation System ER Diagram**.

Level 0 DFD



LEVEL 1 DFD


Registration info
1.1: Resister
Passenger info
Passenger
Registered details
Admin
Login credentials
1.2: Login
Check login credentials
Updated details
All payment details
Passenger details
Available train name and number
1.3: Login enquiry
Train details
Destination and time
Available train list
Selected train details
Available tickets
Ticket details
1.4: Book tickets
Payment of ticket amt
Payment unit
Updated ticket list
Generation of ticket
Enter PNR
1.5: PNR status
Current ticket status
Enter PNR
1.6: Cancel ticket
Return amount(refundable)

5.Graphical User Interface

5.1 Screen short

Home Page:

Login:

Search Train:

Other Screen:

Example:

6.Reference

- Yatra.com
- Irctc.com
- Indianrail.gov.in