Railway Reservation System

A Project Report

Submitted in partial fulfilment of the Requirements for the award of the Degree of

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

By

Shivam Pradeep Rajbhar

Roll no. :- 580

Under the esteemed guidance of

Mr. Surya Prakash Upadhyay Assistant Professor

DEPARTMENT OF INFORMATION TECHNOLOGY

Ramanand Arya D.A.V College

(Autonomous)

OF

ARTS, SCIENCE & COMMERCE BHANDUP,

MUMBAI – 400 042 MAHARASHTRA

AY 2023 – 2024

RAMANAND ARYA D.A.V
COLLEGE
OF ARTS, SCIENCE & COMMERCE
(AUTONOMOUS)
BHANDUP, MUMBAI, MAHARASHTRA – 400 042
DEPARTMENT OF INFORMATION TECHNOLOGY

CERTIFICATE

This is to certify that the project entitled, "**RAILWAY RESERVATION SYSTEM website** ", is bonafied work of **SHIVAM PRADEEP RAJBHAR** bearing Roll No: **580** submitted in partial fulfilment of the requirements for the award of degree of BACHELOR OF SCIENCE in INFORMATION TECHNOLOGY from
University of Mumbai

Internal Guide **Coordinator**

External Examiner

Date: **College Seal**

ACKNOWLEDGEMENT

I express sincere gratitude of Professor Rujuta Sawant on my project guide for making available, the facilities required for the completion of the project.

I greatly indebted to my project guide for his valuable and timely guidance along with his whole hearted cooperation, which has played a key role in the successful completion of the project.

A vote of thanks to all staff members of Ramanand Arya D.A.V College, who have directly or indirectly, contributed towards the completion of the project.

I would also like to thank the non-teaching staff members of the college for allowing me to use the laboratory facilities for as much time as required.

DECLARATION

I hereby declare that the project entitled, **"Railway Reservation System "** done at **Ramanand Arya D.A.V College**, has not been any case duplicated to submit to any other university for the award of any degree. To the best of my knowledge other than me, no one has submitted to any other university.

The project is done in partial fulfilment of the requirements for the award of degree of **BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)** to be submitted as final semester project as part of our curriculum.

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Abstract

The Railway Reservation System website simplifies the process of booking train tickets online. Users can search for available trains, select preferred routes, and choose seating preferences. The system securely manages personal information and payment details. It offers convenience by enabling users to book, modify, or cancel tickets from anywhere. Real-time seat availability and fare information aid decision-making. The website enhances the overall travel experience by reducing queues and providing a user-friendly platform for seamless railway ticket reservations.

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Chapter 1

1. Introduction

The Railway Reservation System website is a user-friendly platform that makes booking train tickets easy and convenient. It allows you to search for available trains, choose your preferred route, and select your seats. You can also securely provide your personal information and payment details. This website saves you from waiting in long queues and lets you book, change, or cancel tickets from anywhere. It's like having a virtual ticket counter at your fingertips, making your train travel planning much simpler and stress-free.

Whether you're planning a vacation, a business trip, or a visit to family and friends, the Railway Reservation System website simplifies the entire process. By creating an account, you can save your details for future bookings, and the system will keep you updated with important information about your journey. It even helps you with special requirements like accessible seating or specific food preferences. If your plans change, you can easily cancel your ticket and get a refund according to the rules. Say goodbye to uncertainty about train schedules and platform information – this website keeps you informed at every step, making train travel a breeze. Furthermore, the Railway Reservation System website ensures that you no longer have to deal with the hassle of visiting a physical ticket counter. It brings the convenience of online shopping to train ticket booking. With just a few clicks, you can explore various train options, compare fares, and make informed decisions. The website's user-friendly interface is designed to cater to all kinds of travelers, whether tech-savvy or new to online booking. Gone are the days of uncertainty and long waits. The website provides real-time information on seat availability, allowing you to secure your preferred seats with ease. It also sends you instant confirmations via email or SMS after successful transactions, giving you peace of mind and keeping you organized for your upcoming journey.

1.1 Objective and Scope of the Project

Train ticket booking and reservation processes.

- Provide a user-friendly online platform for travelers to access and manage bookings.
- Ensure real-time availability and secure booking of train seats.
- Simplify modifications, cancellations, and refunds for passengers.
- Enhance accessibility for passengers with special requirements.
- Deliver timely information on train schedules, delays, and platform details.

chapter
System
Analysis

Preliminary Investigation:-

1. Overview: A preliminary investigation of the railway reservation system website involves a comprehensive analysis of its core functionalities, user interface, and overall performance to understand its current state.

2. Functionality Assessment: The investigation will assess the website's functionality, including user registration, ticket booking, seat availability, and payment processing. This helps identify any issues or inefficiencies in the booking process.

3. User Experience Evaluation: The investigation will focus on the user experience, examining factors such as website navigation, responsiveness on different devices, and the clarity of information presented to users.

4. Security and Privacy: A crucial aspect is assessing the website's security measures to ensure that user data, payment information, and transactions are adequately protected from potential threats and breaches.

5. Performance Testing: Preliminary investigation may include performance testing to evaluate the website's speed and reliability, ensuring it can handle a significant number of concurrent users without downtime or slowdowns.

6. Feedback Collection: Gathering feedback from both users and administrators is essential to identify any specific issues or areas for improvement in the railway reservation system website, helping guide future enhancements and optimizations.

2.2 Feasibility Study:

The railway reservation system website aims to determine its viability and potential success. It assesses technical, operational, economic, and scheduling aspects. It evaluates the availability of required technology, cost implications, revenue projections, and market demand. The study also considers regulatory and legal compliance. By analyzing these factors, it helps in making informed decisions on whether to proceed with the development or enhancement of the website and if it aligns with the organization's goals and resources.

2.3.1 Technical Feasibility:-

The technical feasibility of a railway reservation system website primarily hinges on infrastructure, scalability, and compatibility. Firstly, infrastructure needs reliable servers and database systems to handle concurrent user traffic and data storage. Scalability ensures it can adapt to fluctuating demand. Compatibility necessitates cross-browser and device support. Integration with existing railway systems like ticketing, payment gateways, and real-time data is vital. Security measures, including encryption and data protection, are critical to safeguard user information. Regular maintenance and updates must be feasible for optimal performance. Finally, assessing the availability of technical expertise and resources is vital to ensure successful development and long-term operation of the website.

2.3.2 Economical Feasibility

The economical feasibility of a railway reservation system website is a critical consideration. It involves assessing the financial viability and potential return on investment. This feasibility study evaluates the initial development and ongoing maintenance costs, including server hosting, software updates, and personnel expenses. Revenue sources, such as ticket booking fees and advertising income, must be analyzed to determine if they can cover these costs and generate profit. Additionally, the system's ability to increase efficiency, reduce operational expenses, and enhance customer satisfaction should be considered as factors that impact its overall economic feasibility. Careful financial planning and cost-benefit analysis are essential to ensure the project's long-term sustainability and success.

2.3.3 Legal Feasibility Study

A legal feasibility study for a railway reservation system website assesses compliance with relevant laws, including data protection, intellectual property, and contract laws. It identifies potential legal risks and recommends strategies to ensure legal adherence and minimize liabilities.

Operational Feasibility Study

The operational feasibility study of a railway reservation system website assesses its practicality and viability in real-world usage. It examines whether the system can effectively meet its intended goals within existing operational constraints. This study involves evaluating factors such as resource availability, technical compatibility, and the ability to integrate with existing railway operations. Additionally, it considers the website's scalability, maintenance requirements, and the impact on users, staff, and organizational processes. A positive operational feasibility study suggests that the railway reservation system website can be implemented efficiently, providing reliable and efficient services to customers while aligning with the railway's operational capabilities.

2.3 Project Planning

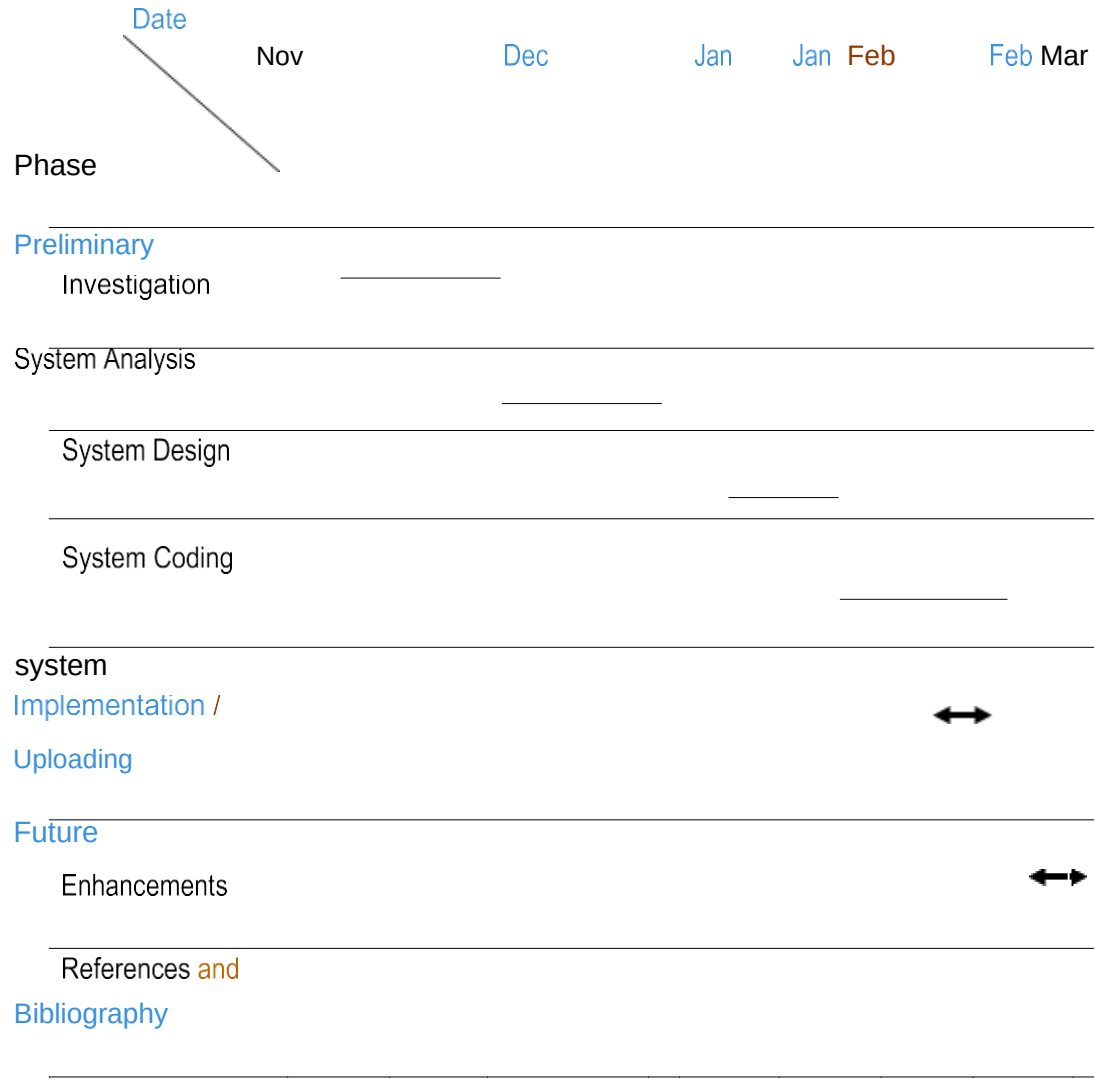
The project planning for the Railway Reservation System website involves a systematic approach to ensure its successful development and deployment. It begins with comprehensive requirements gathering to understand user needs and system functionalities. Next, a detailed project scope and timeline are established, outlining tasks, milestones, and responsibilities. The development phase includes designing an intuitive user interface, robust database architecture, and implementing secure payment gateways. Rigorous testing, including functional, usability, and security testing, is conducted to identify and rectify any issues. Deployment is carefully orchestrated, and user training is provided. Continuous maintenance and support are essential to keep the website running smoothly and ensure customer satisfaction. Clear communication and regular progress monitoring are vital throughout the project to ensure timely delivery and adherence to budget constraints.

2.4 Project Scheduling

The project scheduling for the development of a railway reservation system website involves a structured timeline and sequence of tasks to ensure a successful and timely completion. Initially, project initiation and planning stages will include defining objectives, creating a scope document, and setting clear milestones. The development phase will encompass designing the website's user interface, implementing core functionalities like ticket booking and payment processing, and conducting rigorous testing for security and performance. Concurrently, content creation and database setup will take place. As the project progresses, regular status updates and reviews will be conducted to address any issues or deviations from the schedule. Finally, user acceptance testing and deployment will mark the concluding stages, followed by ongoing maintenance and support to ensure the website's efficiency and functionality post-launch.

2.5.1 Gannt Chart

This chart is a mathematical chart that is used to show the progress of specific tasks in agraphical manner, the graph used is the horizontal bar graph that shows different segments of different parts of the project. The numerical values entered are in percentage format for the percentage of task completed along with the schedule of startof task and its duration and actual start. The Gantt chart below shows the tasks and their duration and percentage completed accordingly for example, tasks like project topic exploration and project topic selection are 100% completed and that too within the duration allotted to them similarly, some tasks like UML diagrams were completed but went ahead of actual duration allotted. All the tasks mentioned in the chart below are a particular stage of project development.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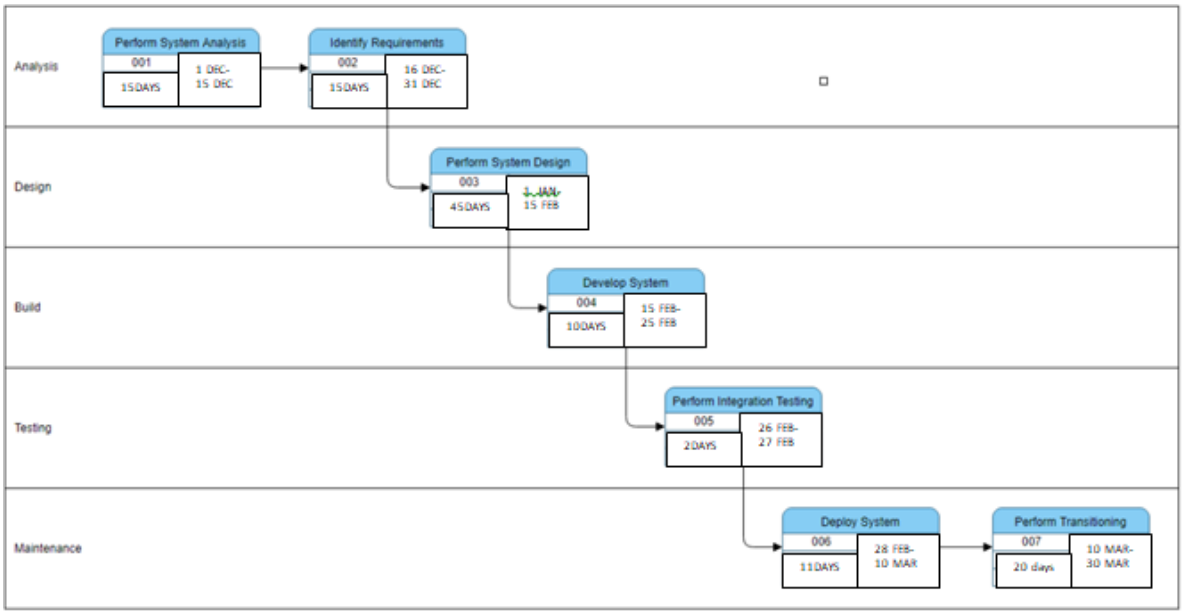
System Analysis
System Design
System Coding
system
Implementation /
Uploading
Future
Enhancements
References and
Bibliography

2.5.2 Pert chart

A PERT chart is a statistical tool used in project management that analyses and tracks activities and milestones by mapping them out on a timeline. A PERT chart is event-oriented: it's comprised of numbered nodes, directional arrows. Activities are represented by these arrows, and nodes are the milestones associated with them. The raw data produced by PERT can be imported into project scheduling software, which helps you manage the whole project.



2.5 Software Requirement Specification

- HTML: HTML is the standard markup language for creating Web pages. HTML stands for Hyper Text Markup language. It describes the structure of a Web page. Html consists of a series of elements. Html elements tell the browser how to display the content. Any website can't be structured without the knowledge of html.
- CSS: CSS stands for Cascading Style Sheet. CSS is the language we use to style a Web page. CSS described how html elements are to be displayed on screen, paper, or in other media.

- JavaScript: JavaScript is the most famous scripting languages of all time. JavaScript is a Scripting Language of World Wide Web. The main Usage of JavaScript is to add various Web function, validations, detections, a creation of cookies and so on. JavaScript is the best scripting language and that is why it is adopted by almost all browsers.

- React: React is JavaScript library for building user interfaces. React is used to build single-page applications. React allows us to create reusable UI components. It makes JavaScript coding easier. It is Excellent cross-platform support and Handles dependencies. It's easy to adopt.
- Node JS: Node JS is an open-source and cross-platform JavaScript runtime environment. It is a popular tool for almost any kind of project. Nodejs runs the V8 JavaScript engine, the core of Google Chrome, Outside the browser. This allows NodeJS to be very performant. It is mostly used as backend language.

- MongoDB: MongoDB is an open-source document database and leading NoSQL database. MongoDB is written in C++. This tutorial will give you great understanding on MongoDB concepts needed to create and deploy a highly scalable and performance-oriented database.

2.6.1 Overall Description

The railway reservation system website is a vital online platform designed to facilitate seamless train ticket booking and management for passengers. This website offers users a user-friendly interface, allowing them to search for train schedules, check seat availability, make reservations, and complete secure online payments. It also provides essential travel information, such as train routes, fares, and station details. The system incorporates robust security measures to safeguard user data and financial transactions. Furthermore, it ensures a smooth user experience by optimizing its performance and responsiveness across various devices. Overall, the railway reservation system website serves as a convenient and efficient tool for travelers, simplifying the booking process and enhancing the overall railway travel experience.

2.6.2 User class and characteristics

- Admins should have the ability to create, modify, or deactivate user accounts, including railway staff, customers, and agents, to ensure proper access and security.

- Admins should oversee the database, track reservations, and ensure system reliability. They must be able to handle exceptions, troubleshoot technical issues, and maintain data accuracy for a seamless reservation process.

2.6.3 Operating Environment

- Front End

- Html
- CSS
- JavaScript

- Back End

- JavaScript
- NodeJS
- MongoDB

- Operating System

- Windows Operating system

- Tools Used

- Visual Studio code

2.6.4 Design Constraints

➢ **Software Constraints**

- Using this system is fairly simple and intuitive.
- A user familiar with basic computer skills should be able to understand all functionalities provided by the system.

- **Hardware Constraints**
  - The solution is functional on a Windows Operating system since the UI is made using HTML , CSS and JavaScript .
  - It cannot be used on a mobile device or on Mac OS

2.6 Software Engineering Paradigm

The paradigm used here is a of waterfall and agile model, thus making this a hybrid model of engineering. All the requirements were gathered prior to the planning phase could begin. Similarly, the development began based on the plan made. However, there were certain features such as the feature to sending the email to the user if there is any update related to ticket. Had this functionality been implemented, the scope of the project would have expanded to incorporate the banking industry as well. Unfortunately, owing to time constraints the feature could not be added.

2.7 Cost estimation of project

This estimation is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus, the developed system is well within the budget and this was achieved, because most of the technologies used are freely available.

Chapter 3

3.1 Algorithm details

The Railway Reservation System algorithm is designed to manage train ticket reservations efficiently. It begins by presenting users with a user-friendly interface to search for train availability, check fares, and make reservations. Here's a simplified description of the algorithm:

1. User Authentication: Users log in or create accounts. The system authenticates their credentials.

2. Search for Trains: Users enter travel details, such as origin, destination, date, and class. The algorithm searches the database for available trains matching the criteria.

3. Display Train Options: The system displays a list of available trains with details like departure time, fare, and seat availability.

4. Seat Selection: Users select a train and the number of seats they want to reserve. The algorithm checks seat availability.

5. Payment Processing: Users proceed to payment. The system calculates the total fare and initiates secure payment processing.

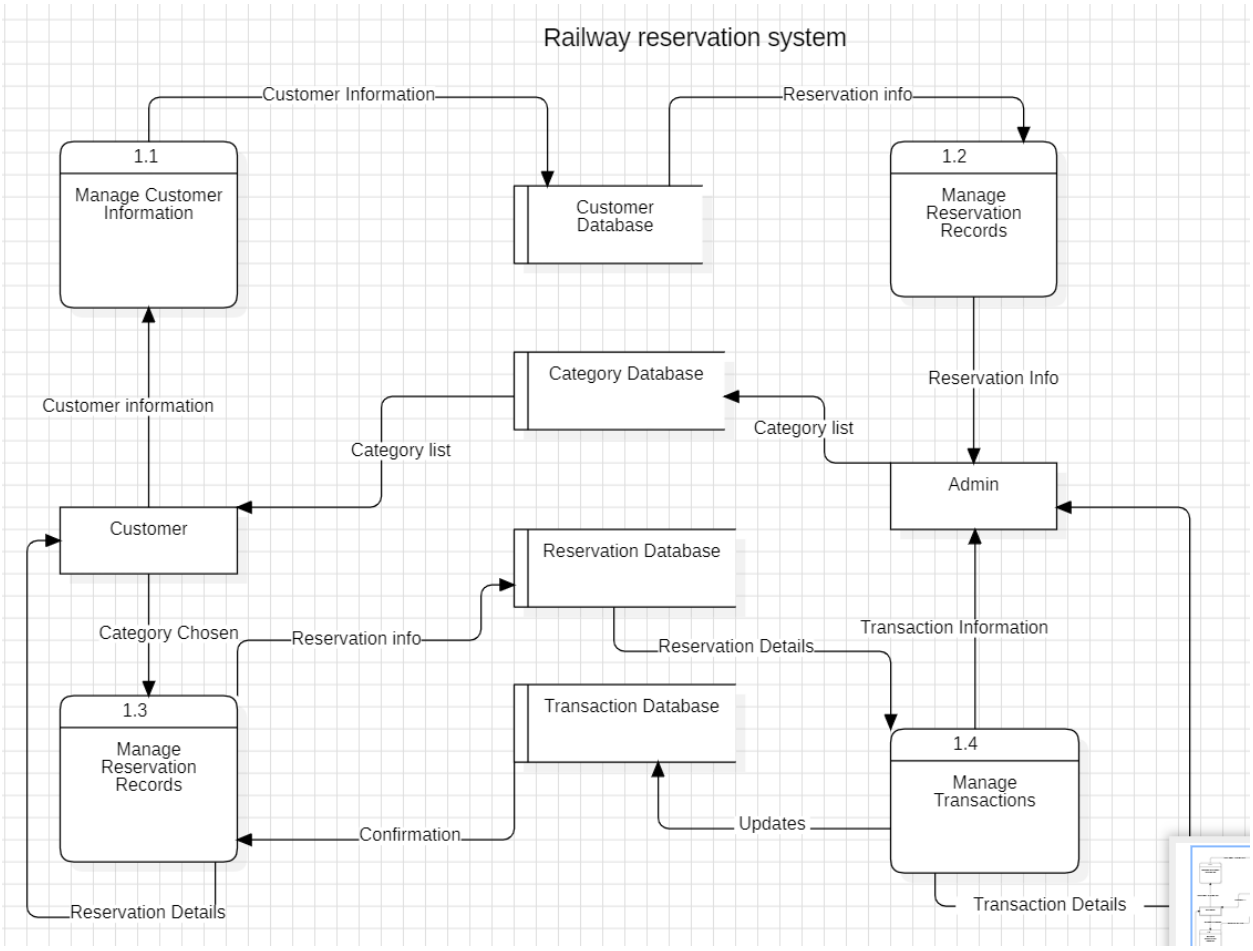
6. Ticket Confirmation: After successful payment, the system confirms the booking and generates an electronic ticket with a unique PNR (Passenger Name Record) number.

7. Cancellation: If necessary, users can request ticket cancellation. The algorithm validates the request, calculates refund amounts, and updates seat availability.

chapter4

Design Models

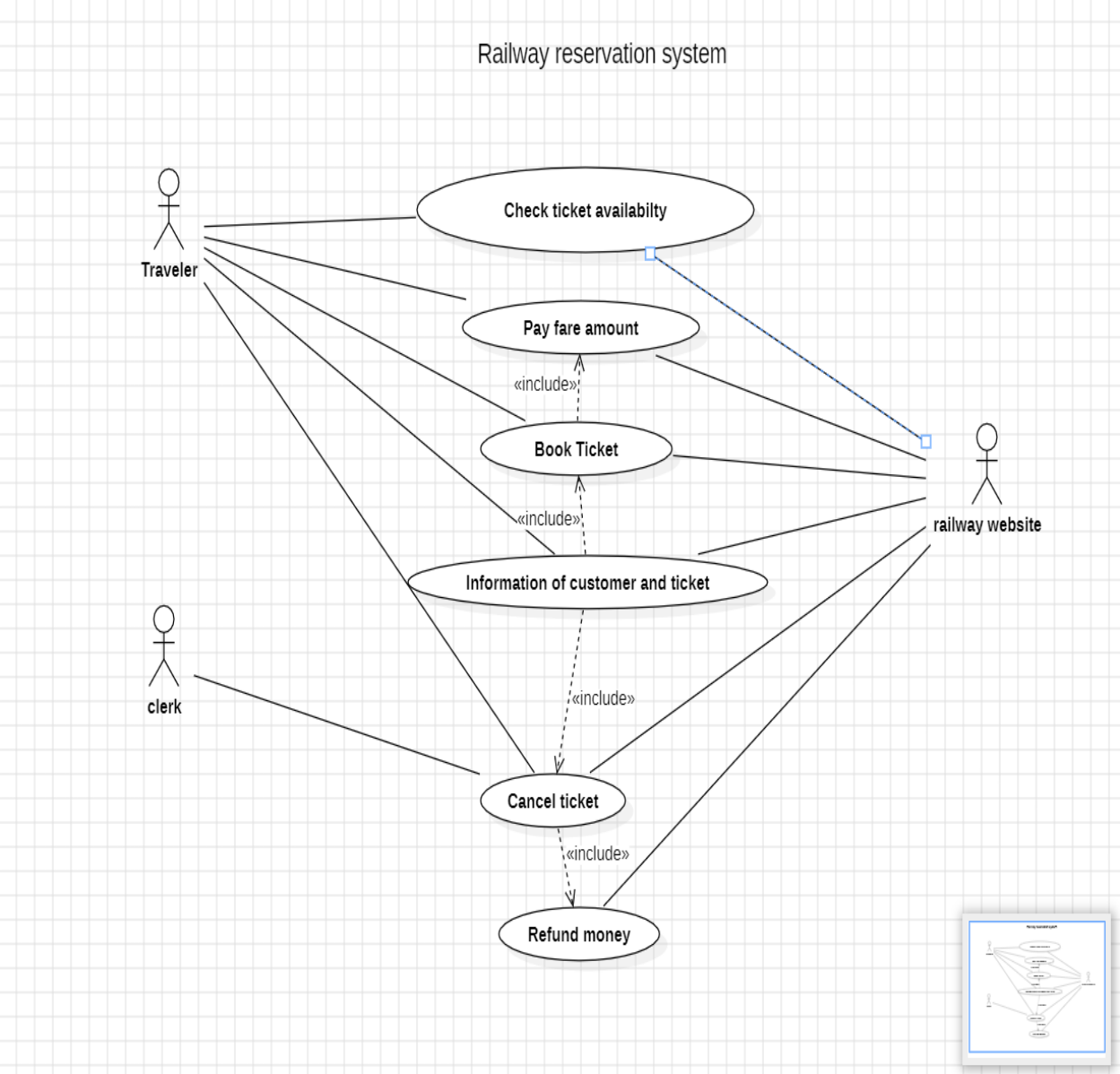
4.1 Data Flow Diagram



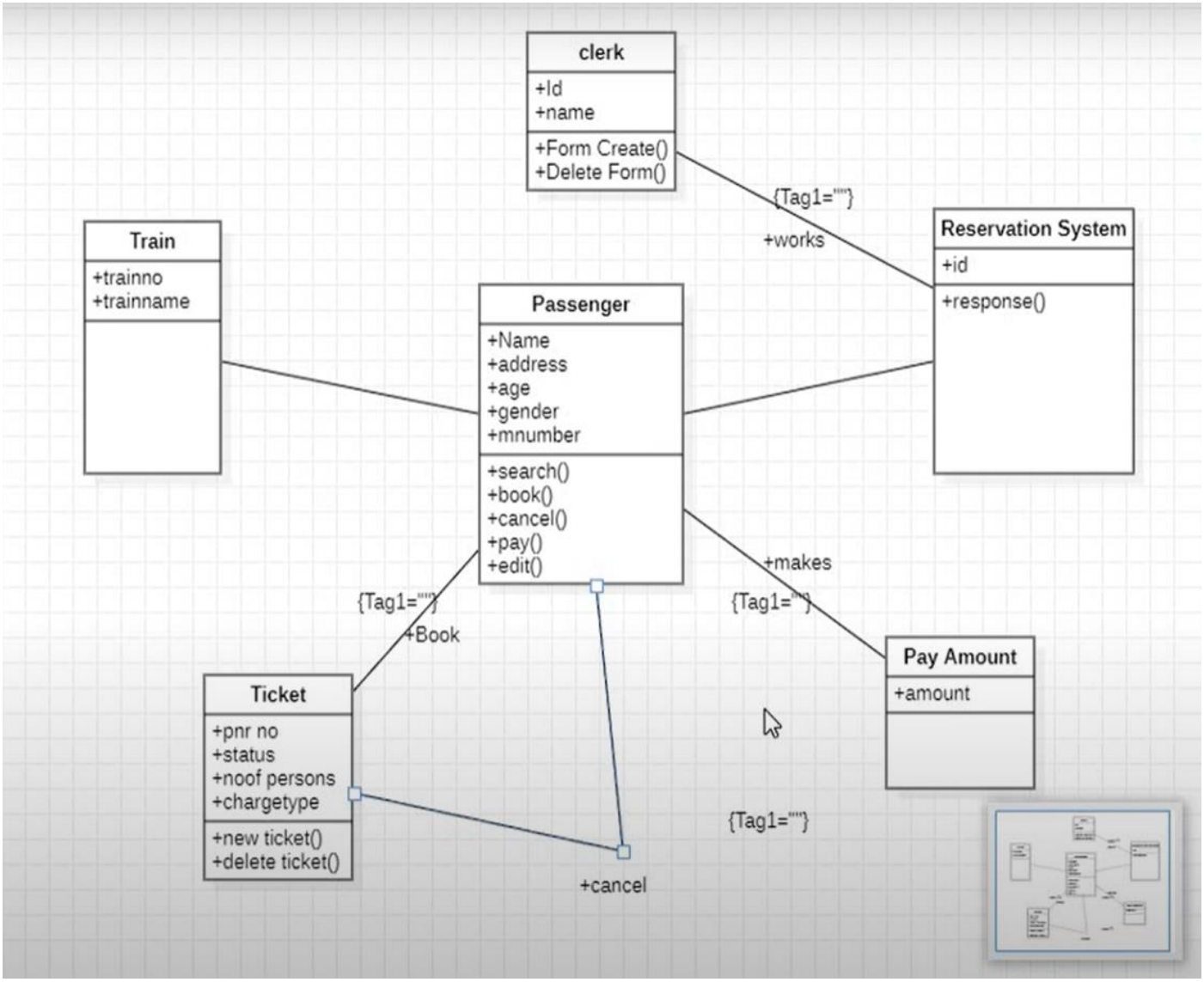
A DFD diagram is a type of diagram that represents a workflow or process. In this diagram explains the step-by-step approach to book ticket.

4.2 Use Case Diagram

In a railway reservation system website, the primary use cases include "User Registration," "Train Search and Booking," "Ticket Cancellation," "Admin Management," and "Payment Processing." These use cases depict core functionalities for both users and administrators.



4.3 Class Diagram



In a railway reservation system website's class diagram, key classes include "User," "Train," "Reservation," and "Payment." User interacts with the system, reserves seats on trains, and makes payments, with associations and attributes defining their relationships and properties.

Sequence Diagram

A sequence diagram in a railway reservation system website visually represents the interaction between users, the website, and the database. It illustrates the order of messages or actions, helping to design, understand, and optimize the reservation process for efficiency and reliability..