RAILWAY RESERVATION SYSTEM TITLE - TRACK MATE

DOCUMENT-6

USE CASE DIAGRAM-



ACTIVITY DIAGRAM



USE CASE SPECIFICATION DOCUMENT

A) 1. Use Case Name: Login

2. Use Case Description: The login use case allows users to authenticate and gain access to the railway reservation system. Users must enter valid credentials (username and password) to log in. Upon successful authentication, they are granted appropriate access based on their role (Passenger, Admin, or Ticket Agent).

3. Actors:

Primary Actors: Registered User (Passenger), Admin, Ticket Agent **Secondary Actors**: System Database, Authentication Server

4. Basic Flow:

The user navigates to the login page.

The system displays the login form with fields for username and password.

The user enters their credentials and submits the form.

The system validates the credentials against the database.

If the credentials are valid, the system grants access and redirects the user to their respective dashboard (Passenger, Admin, or Ticket Agent).

The system logs the successful login attempt.

The user can now access the system functionalities based on their role.

5. Alternate Flow:

Forgot Password Flow:

If the user forgets their password, they click on the "Forgot Password" link.

The system prompts the user to enter their registered email or phone number.

The system sends a password reset link or OTP.

The user resets the password and logs in with the new credentials.

6. Exceptional Flows:

Invalid Credentials:

If the username or password is incorrect, the system displays an error message and prompts the user to try again.

Account Locked:

If the user enters incorrect credentials multiple times (e.g., 5 attempts), the system locks the account and prompts the user to reset their password.

Server Unavailability:

If the authentication server is down, the system displays a message indicating login is temporarily unavailable.

7. Pre-Conditions:

The user must be registered in the system. The authentication server must be operational.

8. Post-Conditions:

If login is successful, the user is granted access to the system. If login fails, an appropriate error message is displayed.

9. Assumptions:

Users will remember their credentials or have a way to reset them. The system maintains role-based access control.

10. Constraints:

Login must be completed within a specific time (e.g., session timeout). Passwords must adhere to security policies (e.g., minimum length, special characters). Only registered users can log in.

11. Dependencies:

User registration module must exist. Authentication system must be functional. Database must be available to verify credentials.

12. Inputs and Outputs:

Inputs: Username, Password **Outputs**: Success message with dashboard access, Error messages (Invalid credentials, Account locked, etc.)

13. Business Rules:

Users must enter valid credentials to gain access. System must enforce password policies. Session timeout will log out inactive users automatically.

14. Miscellaneous Information:

The system should support multi-factor authentication for enhanced security. Future enhancements may include biometric authentication (fingerprint, face recognition).

B)1. Use Case Name- Ticket Availability

2. Use Case Description

This use case allows passengers to check the availability of train tickets for a specific date, route, and class. It provides real-time seat availability based on the latest reservation data.

3. Actors

Primary Actors: Passenger, Travel Agent Secondary Actors: Reservation System

4. Basic Flow

The user (passenger or travel agent) accesses the railway reservation system.

The user selects the desired source and destination stations.

The user enters the travel date and train class.

The system retrieves the list of trains operating on the given date and route.

The system checks the availability of seats in the selected class.

The system displays the available seats with train details, including class, time, and fare.

The user can choose to proceed with booking or exit the system.

5. Alternate Flow

If no seats are available for the requested train and class, the system suggests alternative trains or dates with availability.

If the user enters incomplete information, the system prompts them to provide missing details.

6. Exceptional Flows

If the system is unable to retrieve data due to a network failure, an error message is displayed, and the user is asked to try again later.

If the system experiences high traffic, a delay message is displayed with an estimated wait time.

7. Pre-Conditions

The railway reservation system must be operational. The user must have access to the internet or a railway booking counter. The train schedule must be updated and available in the system.

8. Post-Conditions

The system successfully displays the ticket availability details. The user may choose to proceed with booking or exit the system. If seats are unavailable, alternative suggestions are provided.

9. Assumptions

The system has real-time access to the latest reservation data. The user has basic knowledge of using the reservation system. Train schedules are updated regularly to reflect real-time availability.

10. Constraints

System response time should be less than 5 seconds. Data refresh interval should not exceed 1 minute to ensure up-to-date availability. Availability data should be secured to prevent unauthorized access.

11. Dependencies

The system relies on real-time data updates from the railway database. The availability of alternative suggestions depends on train schedules and seat availability. The system requires continuous internet connectivity for real-time updates.

12. Inputs and Outputs

Inputs: Source station Destination station Travel date Class of travel Outputs: List of available trains Available seat count per class Fare details Train departure and arrival timings

13. Business Rules

Ticket availability is checked in real-time based on live reservation data. Availability should be updated immediately when a ticket is booked or canceled. Waitlist quotas and RAC (Reservation Against Cancellation) limits should be maintained. Special quota bookings (e.g., senior citizen, ladies quota) should be factored into availability checks.

14. Miscellaneous Information

This use case is a core function of the railway reservation system. Future enhancements may include predictive analytics for ticket availability trends.

C) 1. Use Case Name- Book Ticket

2. Use Case Description

This use case describes the process of booking a railway ticket for a passenger through the railway reservation system.

3. Actors

Primary Actors: Passenger Secondary Actors: Reservation system.

4. Basic Flow

The user logs into the railway reservation system. The system prompts the user to enter journey details (source, destination, date, class, etc.). The system retrieves and displays available trains. The user selects a train and chooses the preferred seat/class. The system prompts for passenger details (name, age, ID proof, etc.). The system sends an e-ticket via email/SMS to the user.

5. Alternate Flow

If the preferred class is not available, the system suggests other available options or waitlisting.

If the session times out, the passenger is redirected to the login page.

6. Exceptional Flows

If no trains are available for the selected journey, the system informs the user. If there is a network failure during the process, the system saves partial details and prompts the user to resume later.

7. Pre-Conditions

The user must be registered or logged in. The railway database must have up-to-date train schedules and seat availability. A valid internet connection should be available.

8. Post-Conditions

The system updates the seat inventory after booking confirmation. The user receives a PNR and confirmation via email/SMS.

9. Assumptions

The user has valid payment credentials. The system has real-time seat availability updates. The user provides accurate passenger details.

10. Constraints

The maximum number of tickets per booking is limited (e.g., 6 per user). Booking is allowed only for available/waitlist seats.

11. Dependencies

Railway database for real-time seat availability and train schedules. SMS/Email service for sending ticket confirmations.

12. Inputs and Outputs

Inputs: Journey details (source, destination, date, class) Passenger details (name, age, ID proof) Outputs: Ticket with PNR number Confirmation via SMS/email

13. Business Rules

Users must provide valid ID proof for ticket booking. Concession fares apply only to eligible passengers (e.g., senior citizens, students). Tatkal booking is available only during designated hours.

14. Miscellaneous Information

The system should comply with railway policies and data security regulations. Ticket booking may be disabled during system maintenance.

D)1. Use Case Name: Payment

2. Use Case Description:

This use case describes the process by which a passenger makes a payment to confirm a railway ticket booking. The system verifies the payment details, processes the transaction, and confirms the booking upon successful payment.

3. Actors:

Primary Actors: Passenger Secondary Actors: Railway Reservation System

4. Basic Flow:

The passenger selects a train and enters journey details.

The system displays available seats and fare details.

The passenger selects a preferred seat and proceeds to payment.

The system provides multiple payment options (Credit/Debit Card, Net Banking, UPI, Wallets, etc.).

The passenger enters payment details and confirms payment.

The system sends the payment request to the respective payment gateway.

The payment gateway processes the transaction and communicates with the bank server. The bank validates and authorizes the transaction.

Upon successful payment, the system generates a booking confirmation with a PNR number. The system updates the seat availability and transaction history.

The passenger receives a booking confirmation via SMS and email.

5. Alternate Flow:

A1: Payment via Wallet or UPI

The passenger selects Wallet/UPI as the payment method.

The system redirects to the respective Wallet/UPI provider.

The passenger authorizes the payment.

The system receives payment confirmation and proceeds with booking confirmation.

A2: Payment via Net Banking

The passenger selects Net Banking and chooses a bank.

The system redirects to the bank's payment portal.

The passenger logs in and authorizes the transaction.

The system confirms the payment and completes the booking.

6. Exceptional Flows:

Payment Failure Due to Insufficient Funds Payment Timeout Due to Network Issues Incorrect Payment Credentials Entered Bank Server Downtime Preventing Payment Processing

7. Pre-Conditions:

The passenger must be a registered user or provide valid guest details. The selected train and seat must be available. The payment gateway and bank servers must be operational.

8. Post-Conditions:

The booking is confirmed, and a PNR is generated (for successful payment). The seat availability is updated in the system. The passenger receives a confirmation message.

9. Assumptions:

The passenger has a valid payment method. The payment gateway supports real-time processing. The bank servers are responsive and functional.

10. Constraints:

The payment must be completed within a specified session timeout. Certain payment methods may have transaction limits. Some banks may require additional authentication (e.g., OTP verification).

11. Dependencies:

Availability of banking and payment gateway services. Internet connectivity for online transactions. Real-time seat availability updates in the reservation system.

12. Inputs and Outputs:

Inputs: Passenger details Train details Payment details (Card number, UPI ID, etc.)

Outputs: Payment confirmation status Booking confirmation with PNR Email/SMS notification

13. Business Rules:

Payment should be completed within a specified session time. Refunds are processed as per the cancellation policy. Only verified payment methods are accepted.

14. Miscellaneous Information:

The system should ensure secure transactions through encryption. A failed payment should allow the user to retry or select a different payment method within a grace period.

E) 1. Use Case Name-Refund

2. Use Case Description

This use case describes the process by which a passenger requests a refund for a booked railway ticket. The system validates the request based on eligibility, processes the refund, and updates the necessary records.

3. Actors

Primary Actor: Passenger, Admin Secondary Actors: Customer Support Representative, Payment Gateway, Bank System

4. Basic Flow

The passenger logs into the railway reservation system. The passenger navigates to the "My Bookings" section. The passenger selects the ticket to be cancelled and requests a refund. The system checks the refund eligibility based on the cancellation policy. If eligible, the system calculates the refund amount after deducting applicable charges. The system processes the refund via the original payment method. The passenger receives a confirmation of the refund request. The system updates the booking status to "Canceled with Refund." The transaction details are recorded for audit purposes.

5. Alternate Flow

A1: Partial Refund Scenario

The passenger requests a refund for a ticket booked under a special fare. The system identifies the ticket as non-refundable or partially refundable. The system calculates and displays the partial refund amount. The passenger confirms the refund request. The system processes the partial refund and updates the records accordingly. The passenger receives a confirmation email with refund details.

A2: Refund Due to Train Cancellation
The railway authority cancels a scheduled train.
The system automatically identifies the affected passengers.
The system initiates a full refund without deduction.
Passengers receive a notification about the refund.
The system updates the booking status to "Cancelled due to Train Cancellation."

6. Exceptional Flows

(Not included)

7. Pre-Conditions

The passenger must have a valid booked ticket. The refund request must be initiated before the train's scheduled departure (as per policy).

8. Post-Conditions

The booking status is updated. Refund transaction is recorded and processed.

9. Assumptions

Passengers have access to the online system or customer support. Payment gateways support refund transactions.

10. Constraints

Refund processing time may vary based on the payment method. Some tickets may not be refundable or may have deductions.

11. Dependencies

The system depends on bank/payment gateway APIs for refund processing. The cancellation policy must be correctly configured.

12. Inputs and Outputs

Inputs: Ticket details, payment method, refund request. Outputs: Refund confirmation, updated booking status, transaction records.

13. Business Rules

Refund eligibility depends on ticket type and cancellation timing. Service charges may be deducted as per policy.

14. Miscellaneous Information

Refund policies may change based on railway regulations. Refunds for group bookings may have separate conditions.

Document 7- Screens and pages

Home Page



Login Page

| Login credentials | | | |
|-------------------|-------|---|--|
| User name | | 1 | |
| Password | | 1 | |
| | LOGIN | | |
| | | | |

Register Account

| | Create Account | |
|-------------------------------|----------------|------------------|
| | Full Name | |
| Contact Number | | Email Address |
| Select Picture Choose file | | Address |
| Password | | Confirm Password |
| | Create Account | |

Search Trains

| Search trai Track mate rail | ns ways train tickets R | eservation | |
|--------------------------------|-----------------------------------|------------------|----------------|
| From | | | To |
| Class Select class | | | Date |
| Select class | | | dd/mm/yyyy |
| Adults | Children | Senior men | Senior Women |
| 1 (12-60 yrs) | 0 • (5-11 yrs) | 0 • (50+ yrs) | 0 (58+ yrs) |
| | | | Search trains |

Book Train Tickets

| 10W 10 ventries Search | | | | | |
|------------------------|------------------------|---|--------------------|---------|--|
| | Route | Status | Date/Time | Actions | |
| 1 | Hyderabad to Nizamabad | 25 seats Avaliable for first class 69 seats Avaliable for second class | 12-02-2025/1:30 PM | Book | |
| 2 | Nizamabad to tirupathi | 50 seats Available for first class 100 seats are Avalible for second class | 13-02-2025/6:30 AM | Book | |
| 3 | Hyderabad to Bangalore | 35 seats Avaliable for first class 70 seats Avaliable for second class | 15-02-2025/5:30 PM | Book | |

Purchased Tickets

| Booking- Purchased Tickets Show 10 ▼entries Search | | | | | |
|---|------------|----------------|--|------|--|
| Ticket Number | Trip Date | Status Action | | | |
| 1 2025/0110/1235 | 12-02-2025 | Active | | View | |
| Showing 1 to 1 of 1 entries | P | revious 1 Next | | | |

Cancel Bookings

| entree | | | | | |
|----------------|-------------|-------|------------|--------|--------|
| Ticket Number | Seat Number | Class | Trip Date | Status | Action |
| 2025/0110/1235 | F05 | First | 12-02-2025 | Active | Cancel |

Payment

| Please select the card that you wish to use | | | | | |
|---|---------|----------------|-----|--|--|
| VISA | Pay | Pal | JCB | | |
| Card holder d First Name | letails | Last Name | | | |
| Phone Number | | Credit card No | | | |
| UPI | | | | | |
| Wallet | | | | | |
| Continue to pay | | | | | |

Document 8- Tools-Visio and Axure

In the Railway Reservation Application project, I played a key role in designing system workflows and user interfaces using Microsoft Visio and Axure RP pro7.0. With MS Visio, I developed Use Case Diagrams to outline key system functionalities such as user authentication, ticket booking, seat selection, payment processing, PNR status checking, and cancellation. This helped in clearly defining the scope of interactions between various actors, including passengers, railway staff, and administrators. Additionally, I created Activity Diagrams to map out step-by-step workflows for critical processes like ticket reservation, payment verification, refund processing, and PNR number generation. These diagrams provided a structured representation of system operations, ensuring alignment between business requirements and technical implementation.

For design, I used Axure RP to create interactive wireframes and prototypes that simulated real user interactions. I designed key screens such as the home page, login and registration page, train search and results page, seat selection interface, payment gateway, booking confirmation, and cancellation interface. The use of dynamic panels and interactive elements in Axure enabled stakeholders to visualize the navigation flow, making it easier to identify usability improvements. These wireframes also served as a blueprint for the development team, ensuring consistency between design and implementation.

By combining Visio for system modelling and Axure for interface prototyping, I facilitated seamless communication among stakeholders, helped refine requirements, and ensured a user-friendly and efficient railway reservation system. This structured approach significantly improved clarity in development, reduced rework, and ensured the final system met both functional and user experience expectations.

Document 9- BA experience

1. Requirement Gathering Phase

Role & Responsibilities:

- Conducted stakeholder meetings with railway authorities, booking agents, and passengers to understand pain points in the current manual system.
- Collected functional and non-functional requirements, focusing on features like realtime seat availability, PNR generation, online payment integration, and cancellation policies.
- Created Business Requirement Document (BRD) and gathered approvals from key stakeholders.
- Ensured alignment with railway regulations, security policies, and government compliance standards.

Key Deliverables:

- BRD
- Stakeholder Requirement Document
- High-level use cases

2. Requirement Analysis Phase

Role & Responsibilities:

- Collaborated with SMEs (Subject Matter Experts) to refine and prioritize requirements.
- Defined system workflows, process diagrams, and use case models to visualize the booking lifecycle.
- Identified dependencies, constraints, and risks related to payment gateways, server load, and real-time data updates.
- Prepared Business Requirement Specification (BRS) and Software Requirement Specification (SRS) documents for clear documentation of the system functionalities.
- Created Functional Requirement Specification (FRS) .

Key Deliverables:

- FRS, BRS, SRS
- Use Case Diagrams (via Visio)
- Activity Diagrams
- Requirement Traceability Matrix

3. Design Phase

Role & Responsibilities:

- Worked closely with UI/UX designers to develop wireframes and prototypes for userfriendly interfaces (Balsamiq for wireframing).
- Reviewed Entity-Relationship (ER) diagrams and data flow models to ensure smooth database interactions.
- Provided inputs on system architecture and integration points (e.g., third-party payment, SMS alerts, ticket printing).
- Ensured compliance with security standards, like encryption of personal and payment details.
- Update RTM

Key Deliverables:

- Wireframes & Prototypes
- Data Flow Diagrams (DFD)
- System Architecture Document
- RTM

4. Development Phase

Role & Responsibilities:

- Acted as a bridge between developers and stakeholders, ensuring all requirements were implemented correctly.
- Conducted daily stand-up meetings with developers to resolve roadblocks and clarify doubts.
- Reviewed and validated early system builds, ensuring alignment with business logic and workflows.
- Updated documentation for change requests and new enhancements.

Key Deliverables:

- Change Request Document
- Review Meetings

5. Testing Phase

Role & Responsibilities:

- Collaborated with QA testers to define test scenarios, test cases, and acceptance criteria.
- Conducted User Acceptance Testing (UAT), simulating real-world scenarios like bulk booking, waitlisting, and refunds.
- Ensured that performance testing was conducted to handle peak hours (festival seasons, ticket release windows).
- Reported defects and worked with developers to resolve critical issues before deployment.

Key Deliverables:

- UAT Test Cases
- Defect Report
- Test Summary Report

6. Deployment & Post-Implementation Phase

Role & Responsibilities:

Assisted in go-live planning, including data migration from manual records to the new system. Monitored early-stage adoption, collecting feedback from railway staff and passengers.

Provided training sessions and user manuals to ensure smooth transition.

Gathered post-implementation feedback and prepared an improvement roadmap for future updates.

Key Deliverables:

- Deployment Plan
- User Training Guides
- Post-Implementation Review Report