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**USE CASE BY:**

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* **Book Tickets:**
  + **Primary Actor:** Passenger
  + **Level:** Primary
  + **Scope:**
    - Allows passengers to book train tickets online, covering journey selection, payment processing, and ticket issuance.
  + **Stakeholders and Interests:** 
    - **Passenger:** wants to book tickets for a desired train journey.
    - **Train Operator:** wants to sell tickets and collect revenue from passengers.
    - **Payment Service Provider:** wants to process payments securely and reliably.
  + **Preconditions:**
    - The passenger has access to the internet and a web browser.
    - The train operator has a website that allows passengers to search and book tickets online.
  + **Post-Conditions:**
    - A booking record is created in the train operator's system with journey details, passenger information, and payment confirmation.
    - The payment service provider sends payment confirmations to the train operator and the passenger.
    - Seats are reserved for the passenger on the selected train, and their availability is updated.
    - E-tickets are generated and sent to the passenger via email or SMS, which can be printed or saved.
    - The passenger receives confirmation of the successful booking and payment, along with the e-tickets.
    - Reserved seats are held temporarily, allowing the passenger to complete the booking. If the passenger cancels or abandons the process, these seats are released.
    - In case of unavailability, payment failure, or passenger cancellation, appropriate error messages are displayed, and the booking process terminates, releasing reserved seats for others to book.
  + **Main Success Scenario:**
    - The passenger visits the train operator's website and enters the origin, destination, date, and number of passengers for the desired journey.
    - The website displays the available trains, fares, and seat classes for the requested journey.
    - The passenger selects a train, fare, and seat class and clicks on the "Book Now" button.
    - The website redirects the passenger to the payment service provider's website, where the passenger enters their payment details and confirms the payment.
    - The payment service provider verifies the payment and sends confirmation to the train operator and the passenger.
    - The train operator issues the tickets and sends them to the passenger via email or SMS.
    - The passenger receives the tickets and prints them or saves them on their mobile device.
  + **Extension:**
    - No trains are available for the requested journey.
      1. The website displays a message informing the passenger that no trains are available and suggests alternative dates or routes.
      2. The passenger can either modify their search criteria or cancel the booking process.
    - The passenger cancels the payment process or closes the browser window before completing the payment.
      1. The payment service provider notifies the train operator that the payment was not completed.
      2. The train operator releases the reserved seats and cancels the booking.
      3. The passenger can either restart the booking process or abandon it.
    - The payment is declined or fails due to technical or other reasons.
      1. The payment service provider displays an error message to the passenger and asks them to try again or use a different payment method.
      2. The passenger can either retry the payment or cancel the booking process.
* **Cancel Reservations**
  + **Primary Actor:** Passenger
  + **Level:** Primary
  + **Scope:** 
    - Allows passengers to cancel their train reservations through the train operator's website or app, considering cancellation policies and refund processing.
  + **Stakeholders and Interests:** 
    - **Passenger:** wants to cancel their reservation and get a refund if applicable.
    - **Train Operator:** wants to handle cancellations efficiently and retain passenger satisfaction.
    - **Payment Service Provider:** wants to process refunds securely and reliably.
  + **Preconditions:** 
    - The passenger has booked tickets for a train journey through the train operator's website or app.
    - The train operator has a cancellation policy that specifies the conditions and fees for canceling reservations.
    - The payment service provider has an API that integrates with the train operator's website or app.
  + **Post-Conditions:**
    - The passenger's reservation is successfully canceled in the train operator's system.
    - Reserved seats are released and become available for other passengers to book.
    - The payment service provider processes any applicable refunds in accordance with the cancellation policy.
    - Confirmation of the cancellation and, if applicable, refund details are sent to the passenger via email or SMS.
    - The passenger receives the cancellation confirmation and checks their refund status on their bank account or credit card statement.
    - The passenger's booking status is updated to reflect the cancellation, ensuring accurate records are in the train operator's database.
    - Any associated fees or charges are applied as per the cancellation policy and reflected in the passenger's account.
  + **Main Success Scenario:**
    - The passenger visits the train operator's website or app and logs in with their credentials or booking reference number.
    - The website or app displays the passenger's bookings and allows them to select one or more bookings to cancel.
    - The passenger selects a booking to cancel and clicks on the "Cancel Booking" button.
    - The website or app displays the cancellation policy and asks the passenger to confirm their cancellation request.
    - The passenger confirms their cancellation request and agrees to pay any cancellation fees if applicable.
    - The website or app sends the cancellation request to the train operator and the payment service provider.
    - The train operator cancels the reservation and releases the seats for other passengers.
    - The payment service provider processes the refund according to the cancellation policy and sends confirmation to the train operator and the passenger.
    - The train operator sends a cancellation confirmation email or SMS to the passenger with details of their refund amount if any.
    - The passenger receives the cancellation confirmation email or SMS and checks their refund status on their bank account or credit card statement.
  + **Extension:**
    - The passenger requests a refund for a non-refundable booking.
    - The website or app informs the passenger that the booking is non-refundable and provides details of the cancellation policy.
    - The passenger can choose to proceed with the cancellation without a refund or cancel the cancellation request.
* **Manage Train Schedules**
  + **Primary Actor:** Train Scheduler
  + **Level:** Primary
  + **Scope:** 
    - It involves train schedulers efficiently and accurately creating, updating, deleting, and viewing train schedules.
  + **Stakeholders and Interests:** 
    - **Train Scheduler:** wants to create, update, delete, and view train schedules efficiently and accurately.
    - **Train Operator:** wants to have accurate and up-to-date train schedules that meet operational requirements and passenger demand.
    - **Passenger:** wants to have reliable and convenient train schedules that suit their travel needs.
  + **Preconditions:**
    - The train scheduler has access to a computer system that allows them to manage train schedules online using a secure login ID and password.
    - The train operator has a database that stores train schedules and related information such as train routes, stations, timings, fares, seat classes, etc.
  + **Post-Conditions:**
    - Newly created train schedules are accurately recorded in the train operator's database, including train routes, stations, timings, fares, seat classes, and other relevant details.
    - Updated train schedules reflect the modifications made by the train scheduler, ensuring that operational and passenger requirements are met.
    - Deleted train schedules are removed from the train operator's database, and associated bookings, if any, are canceled as per the train operator's policies.
    - Viewing an existing train schedule provides train schedulers with the necessary information, facilitating efficient schedule management.
    - In case of extension 1, train schedules with conflicting timings are resolved, ensuring that no overlapping schedules exist in the system.
    - In case of extension 2, the train scheduler can choose to proceed with the deletion of a schedule with existing bookings, which would also cancel the associated bookings, or cancel the deletion request, maintaining operational integrity.
  + **Main Success Scenario:**
    - The train scheduler logs in to the computer system and accesses the train schedule management module.
    - The computer system displays the existing train schedules and allows the train scheduler to perform various actions such as create, update, delete, and view train schedules.
    - The train scheduler performs one or more of the following actions:
    - Create a new train schedule: The train scheduler enters the required information such as train route, stations, timings, fares, seat classes, etc. and clicks on the "Create Schedule" button. The computer system validates the information and creates a new train schedule in the database.
    - Update an existing train schedule: The train scheduler selects an existing train schedule and modifies the information such as train route, stations, timings, fares, seat classes, etc., and clicks on the "Update Schedule" button. The computer system validates the information and updates the train schedule in the database.
    - Delete an existing train schedule: The train scheduler selects an existing train schedule and clicks on the "Delete Schedule" button. The computer system asks the train scheduler to confirm their deletion request and deletes the train schedule from the database.
    - View an existing train schedule: The train scheduler selects an existing train schedule and clicks on the "View Schedule" button. The computer system displays the details of the train schedule such as train route, stations, timings, fares, seat classes, etc.
    - The computer system displays a confirmation message to the train scheduler after each action and allows them to perform more actions or log out of the system.
  + **Extension 1:**
    - Train Scheduler attempts to create a schedule with conflicting timings.
    - The train scheduler attempts to create a new train schedule with timings that overlap with an existing schedule.
    - The computer system displays an error message indicating the conflict and asks the train scheduler to adjust the timings.
    - The train scheduler revises the timings and proceeds with the schedule creation.
  + **Extension 2:**
    - Train Scheduler tries to delete a schedule with existing bookings.
    - The train scheduler attempts to delete a train schedule that has existing bookings.
    - The computer system displays a warning message informing the train scheduler that there are active bookings associated with the schedule.
    - The train scheduler can choose to proceed with the deletion, which would also cancel the associated bookings, or cancel the deletion request.
* **Check Seat Availability**
  + **Primary Actor:** Passenger
  + **Level:** Primary
  + **Scope:**
    - Allows passengers to assess seat availability for a desired train journey.
  + **Stakeholders and Interests:** 
    - **Passenger:** wants to check seat availability for a desired train journey before booking tickets.
    - **Train Scheduler:** wants to provide accurate and real-time seat availability information to passengers and encourage them to book tickets online.
  + **Preconditions:** 
    - The passenger has access to the internet and a web browser.
    - The train scheduler has a website that allows passengers to search and check seat availability online.
    - The train scheduler has a database that stores seat availability information for each train schedule.
  + **Post-Conditions:**
    - The passenger receives real-time seat availability information for the selected journey, including details of available seats, waitlisted status, or sold-out status.
    - The passenger's seat selection, if made during the booking process, may need to be adjusted if seat availability changes due to simultaneous bookings.
    - Passengers can proceed to book tickets, modify their search criteria, choose different seats, select alternative trains, or cancel the booking process based on the seat availability information provided.
  + **Main Success Scenario:**
    - The passenger visits the train scheduler's website and enters the origin, destination, date, and number of passengers for the desired journey.
    - The website displays the available trains, fares, and seat classes for the requested journey.
    - The passenger selects a train, fare, and seat class and clicks on the "Check Availability" button.
    - The website queries the database and displays the seat availability status for the selected journey such as available, waitlisted, or sold out.
    - The passenger can either proceed to book tickets or modify their search criteria or cancel the search process.
  + **Extension:**
    - Passenger encounters a sudden unavailability while booking.
    - After checking seat availability, the passenger initiates the booking process but encounters a message indicating that the seats they selected have become unavailable due to simultaneous bookings.
    - The website prompts the passenger to select different seats or choose an alternative train if available.
    - The passenger can either modify their seat selection or choose another train or cancel the booking process.
* **Calculate Fares**
  + **Primary Actor:** Passenger
  + **Level:** Primary
  + **Scope:**
    - Allows passengers to determine the cost of a desired train journey before booking tickets through the website.
  + **Stakeholders and Interests:** 
    - **Passenger:** wants to calculate fares for a desired train journey before booking tickets.
    - **Train Scheduler:** wants to provide accurate and transparent fare information to passengers and encourage them to book tickets online.
  + **Preconditions:** 
    - The passenger has access to the internet and a web browser.
    - The train scheduler has a website that allows passengers to search and calculate fares online.
    - The train scheduler has a fare calculation algorithm that considers various factors such as distance, seat class, demand, taxes, discounts, etc.
  + **Main Success Scenario:**
    - The passenger visits the train scheduler's website and enters the origin, destination, date, and number of passengers for the desired journey.
    - The website displays the available trains, fares, and seat classes for the requested journey.
    - The passenger selects a train, fare, and seat class and clicks on the "Calculate Fare" button.
    - The website applies the fare calculation algorithm and displays the total fare for the selected journey along with a breakdown of its components such as base fare, taxes, discounts, etc.
    - The passenger can either proceed to book tickets or modify their search criteria or cancel the search process.
  + **Extension:**
    - Passenger applies a discount or promo code.
    - The passenger selects a train, fare, and seat class and clicks on the "Calculate Fare" button.
    - The passenger enters a discount or promo code and clicks on the "Apply" button.
    - The website validates the code and recalculates the fare, applying the discount if valid.
    - The passenger views the updated fare with the applied discount and can proceed to book tickets or continue to modify their search criteria.
* **Manage Passenger Profile**
  + **Primary Actor:** Passenger
  + **Level:** Primary
  + **Scope:**
    - This use case allows passengers to manage their profile information.
  + **Stakeholders and Interests:** 
    - **Passenger:** Interested in updating personal information, password, or contact details
    - **Train Scheduler:** Ensures passenger profiles are accurate and up to date.
  + **Preconditions:** 
    - The passenger is logged into the system(profile).
  + **Postconditions:** 
    - The passenger's profile information is updated.
  + **Main Success Scenario:**
    - The train scheduler logs into the system and accesses the train information management module.
    - The system displays existing train data and allows the train scheduler to execute various actions, including creating, updating, deleting, or viewing train information.
    - Passenger makes desired updates.
    - System saves the changes.
    - The passenger receives a confirmation message that their profile has been successfully updated.
  + **Extension:**
    - If there are validation errors in the updated information, the system provides feedback and asks the passenger to correct the errors.
* **Manage Train Information**
  + **Primary Actor:** Train Scheduler
  + **Level:** Primary
  + **Scope:** Allows train schedulers to manage train-related information.
  + **Stakeholders and Interests:** 
    - **Train Scheduler:** Interested in updating train schedules, adding new trains, or modifying existing train details.
    - **Railway Company:** Ensures accurate and up-to-date train information.
  + **Preconditions:**
    - The train scheduler has access to the system for managing train information.
    - The train scheduler is logged into the system(profile).
    - The train scheduler maintains a database containing train details such as schedules, routes, stations, fares, seat classes, etc.
  + **Postconditions:** 
    - If the train scheduler successfully creates or updates a train record, the database contains the new or modified train record with accurate details, including route, stations, timings, fares, seat classes, etc.
    - If the train scheduler successfully deletes a train record and confirms the deletion, the database no longer contains the deleted train record.
    - After viewing an existing train record, the train scheduler has access to detailed information about the selected train, including its route, stations, timings, fares, seat classes, etc.
    - The train scheduler receives confirmation messages after each action (create, update, delete, view), ensuring that their requested actions have been processed.
    - If the train scheduler chooses to delete a train record associated with active bookings, the system cancels the linked bookings as well, ensuring that passengers are informed of the cancellations.
    - Train information is updated in the system.
  + **Main Success Scenario:**
    - The train scheduler logs into the system and accesses the train information management module.
    - The train scheduler selects the option to manage train information.
    - The system displays existing train data and allows the train scheduler to execute various actions, including creating, updating, deleting, or viewing train information.
    - The train scheduler can perform the following actions:
      1. Create a new train record by inputting required information and clicking "Create Train." The system validates the data and adds it to the database.
      2. Update an existing train record by selecting it, modifying details, and clicking "Update Train." The system validates changes and updates the record.
      3. Delete an existing train record by selecting it, clicking "Delete Train," and confirming. The system removes the train record.
      4. View an existing train record by selecting it and clicking "View Train." The system displays the train's details.
      5. Confirmation messages are provided after each action, allowing the train scheduler to continue or log out.
    - The train scheduler makes desired updates.
    - System saves the changes.
  + **Extension:**
    - Train Scheduler attempts to update a record with conflicting information.
      1. The train scheduler attempts to modify a train record with data that conflicts with existing records.
      2. The system displays an error message indicating the conflict and asks the train scheduler to adjust the data.
      3. The train scheduler revises the data and proceeds with the update.
    - Train Scheduler tries to delete a record associated with active bookings.
      1. The train scheduler attempts to delete a train record linked to active bookings.
      2. The system issues a warning message, informing the train scheduler of the active bookings associated with the record.
      3. The train scheduler can choose to continue with the deletion, which also cancels the linked bookings, or cancel the deletion request.
* **Generate Reports**
  + **Primary Actor:** Train Operator
  + **Level:** Primary
  + **Scope:**
    - This use case allows train operators to generate various reports related to reservations and revenue.
  + **Stakeholders and Interests:**

**Train Operator:** Interested in generating reports for business analysis.

**Railway Company:** Uses reports for decision-making and financial planning.

* + **Preconditions:** 
    - The Train Operator is logged into the system.
  + **Postconditions:** 
    - Reports are generated and available for download.
  + **Main Success Scenario:**
    - Train Operator selects the type of report to generate (e.g., daily reservations, monthly revenue).
    - System generates the selected report.
    - Train Operator downloads the report.
  + **Extension:**
    - None
* **Handle Complaints**
  + **Primary Actor:** Train Operator
  + **Level:** Primary
  + **Scope:**
    - This use case involves handling complaints from passengers.
  + **Stakeholders and Interests:**

**Passenger:** Interested in specifying special requests for their journey.

**Train Operator:** Ensures passenger requests are accommodated.

* + **Preconditions:** 
    - The train operator has a system in place for receiving and managing passenger complaints.
    - Passengers have the means to submit complaints through various channels, such as email, phone, or an online portal.
  + **Postconditions:** 
    - The special request is noted and forwarded to the relevant departments for implementation.
  + **Main Success Scenario:**
    - A passenger submits a complaint through one of the available channels, providing details about their issue and contact information.
    - The complaint is logged into the system, assigning it a unique reference number.
    - A passenger support representative logs into the complaint management system and views the list of pending complaints.
    - The representative selects a complaint from the list to handle.
    - The representative reviews the complaint details, including the passenger's description of the issue.
    - The system generates and sends a confirmation message to the passenger, acknowledging the receipt and resolution of their complaint.
    - The representative updates the complaint status to "Resolved" in the system.
  + **Extension:**
    - If the request cannot be accommodated due to operational constraints, the system informs the passenger and offers alternatives if possible.
* **Manage Luggage**
  + **Primary Actor:** Passenger
  + **Level:** Primary
  + **Scope:**
    - Allows train scheduler to handle passenger’s luggage.
  + **Stakeholders and Interests:** 
    - **Passenger:** To take care of the luggage. And the luggage is received by each passenger.
    - **Train** **Scheduler:** Aims to efficiently manage and transport passengers' luggage while maintaining security and timeliness.
  + **Preconditions:**
    - The passenger is traveling that involves luggage.
    - The train scheduler has procedures and systems for managing luggage.
    - Check if the train storage is full or not to load the luggage.
  + **Postconditions:** 
    - Luggage is tagged and registered with a unique identifier in the transportation provider's system.
    - Every passenger takes their luggage according to their name.
  + **Main Success Scenario:**
    - The passenger proceeds to the luggage check-in counter.
    - The passenger provides necessary identification and travel information to the agent.
    - Assign the appropriate names to each luggage according to the passenger.
    - Load this luggage on the train.
    - Hand over the luggage to the passenger.
  + **Extension:**
    - If the passenger’s luggage is mishandled or delayed (e.g., lost, damaged, or not available upon arrival), the transportation service provider initiates a luggage search and recovery process to locate and deliver the luggage to the passenger.
    - There is not enough space to carry the luggage of some passengers.