Car Rental System

- Lakshay

Introduction

1. Car rental system managing short-term automobile rentals.
2. Multiple offices in various city locations, often near airports or city centers.
3. Users can reserve and return vehicles from different locations.
4. Database storing client information: name, address, contact number.
5. Reservation functionality for members: pickup/drop-off locations, vehicle type, reservation date/time.
6. Member actions include reserving, hiring, and returning vehicles.
7. System facilitates booking for a certain number of days.

Discussion Points

1. Discussion on vehicle types:
    1. Supported vehicle types in the system.
    2. Methods to identify specific vehicles.
2. Search interface:
    1. Ability to search vehicles by name, type, or model number.
3. Services:
    1. Consideration of driver assignment and roadside assistance.
4. Reservation cancellation:
    1. Member's ability to cancel reservations.
    2. Criteria for member-initiated reservation cancellations. (Who are allowed to cancel)
5. Payment flexibility:
    1. Handling of payments across branches (physical branch) and methods (cash, credit, cheque).
    2. Mechanism to track payments made by customers at different branches.

Car Rental System Requirements Simplified

1. **Users:** The system has two types of users: customers, who rent vehicles, and receptionists, who manage the rental process.

2. **Vehicle Types:** The system will include various vehicle types such as cars, trucks, vans, and motorcycles for rental.

3. **Vehicle Subtypes:** Each vehicle type has subcategories:

   - Cars can be economy, luxury, standard, or compact.

   - Vans can be passenger or cargo.

   - Motorcycles can be cruiser, touring, or sports.

   - Trucks can be categorized as light, medium, or high-duty.

4. **Reservation Records:** The system will record who has rented each vehicle and the date it was issued.

5. **Rental Tracking:** The system will track how many vehicles a particular customer has rented.

6. **Reservation Cancellation:** Customers should be able to cancel their reservations.

7. **Vehicle Log:** To monitor all activities related to each vehicle, the system will keep a detailed log.

8. **Additional Equipment:** Users can add extra equipment to their reservations, such as ski racks, child seats, and GPS navigation systems.

9. **Additional Services:** Users can also add extra services to their reservations, like hiring a driver, having Wi-Fi access, and getting roadside assistance.

10. **Overdue Notifications and Fines:** If a vehicle isn't returned by the due date, the system will notify the customer and impose a fine.

11. **Vehicle Search:** Users can search for vehicles by type or model within the system.

12. **Branch Management:** The system will oversee multiple branches of the car rental service.

13. **Parking Facilities:** Each branch will have parking stalls for the vehicles.

Use-case Diagram

1. System: The Car Rental System
2. Actors
   1. Primary: Member/User - who can reserve, modify, do payment, cancel etc.
   2. Secondary
      1. Receptionist
         1. Acts as the system's admin with all privileges of a "Member".
         2. Can add, remove, or modify vehicles and reservations.
         3. Has the authority to update logs.
      2. System: Responsible for sending reservation-related notifications to members.

Use-cases of Member

1. Create Account: For creating a new account within the system.
2. Update/Cancel Account: For modifying account details or terminating an account.
3. Login/Logout: To access or exit the car rental system.
4. Search Vehicle Inventory: To browse available vehicles in the inventory.
5. Make Reservation: For reserving a vehicle.
6. Cancel Reservation: To annul a previously made vehicle reservation.
7. Update Reservation: For adjusting existing reservation details.
8. Return Vehicle: To bring back the vehicle to the rental facility.
9. Pickup Vehicle: For retrieving the reserved vehicle from the rental facility.
10. Pay Bill: To settle the vehicle rental charges.

Use-cases of Receptionist

1. Create account: To create a new account on the system
2. Update/cancel account: To update account information or to cancel an account
3. Login/Logout: To log in and out of the car rental system
4. Search vehicle inventory: To search for vehicles from the inventory
5. Make a reservation: To make a reservation for a vehicle
6. Cancel reservation: To cancel the reservation of the vehicle
7. Update reservation: To update the reservation information of the vehicle
8. Add vehicle: To add a new vehicle to the car rental system
9. Remove vehicle: To remove a vehicle from the car rental system
10. Modify vehicle: To modify a vehicle status or information from the car rental system
11. Update log: To update the vehicle log

Use-cases of System

1. Send overdue notification: Notifies if the date and time for vehicle return are passed.
2. Send reservation notification: Sends a notification of the reservation made.
3. Send reservation canceled notification: Notifies of any canceled reservation.

Relationships: Generalisation

-In this section, we outline the connections and interactions between actors and their respective use cases.
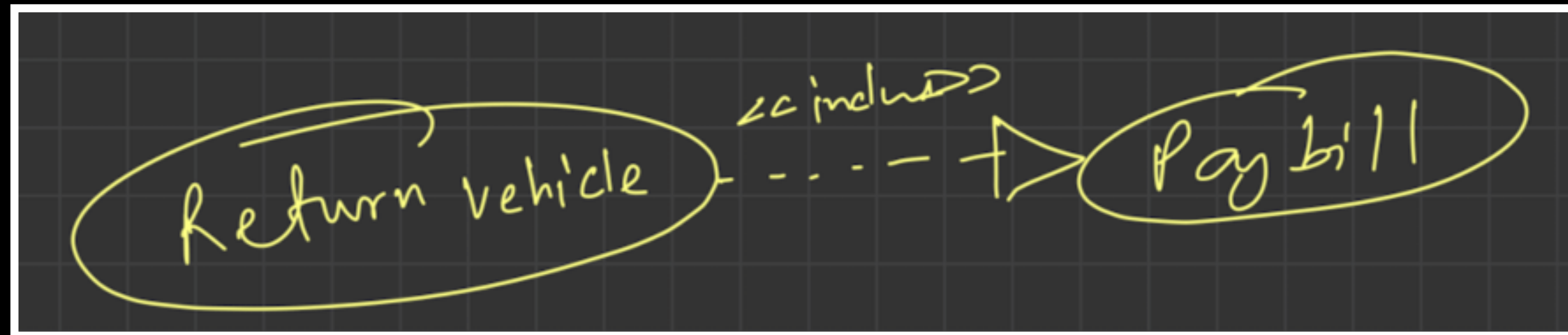
1. "Add vehicle" is generalized by "Add car," "Add truck," "Add van," and "Add motorbike" use cases.

2. "Remove vehicle" is generalized by "Remove car," "Remove truck," "Remove van," and "Remove motorbike" use cases.

3. "Modify vehicle" is generalized by "Modify car," "Modify truck," "Modify van," and "Modify motorbike" use cases.

Relationships: Associations

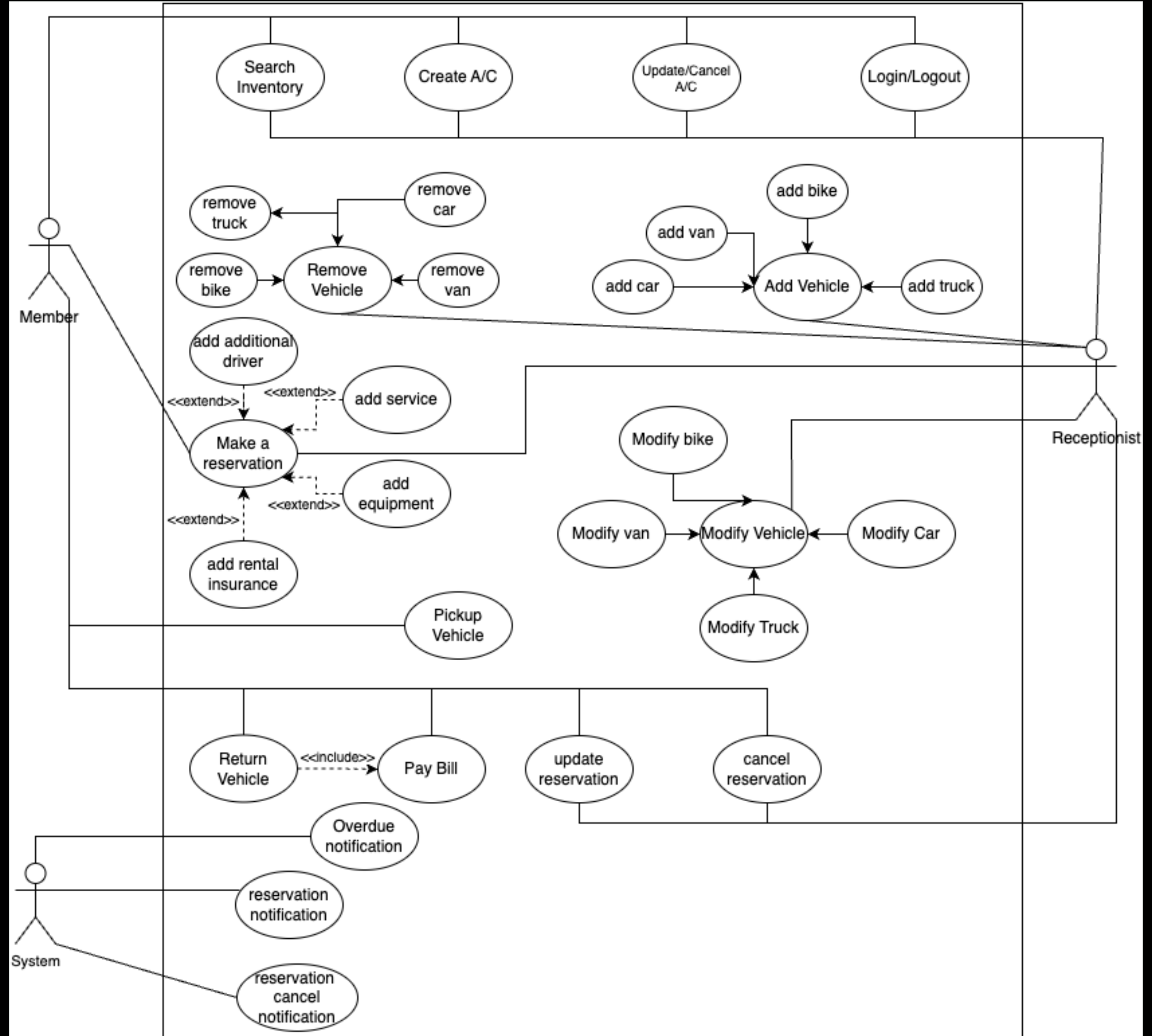| Member	Receptionist	System
Create a new account	Create a new account	Reservation canceled notification
Update/cancel account	Update/cancel account	Send reservation notification
Login/Logout	Login/Logout	Overdue notification
Search vehicle inventory	Search vehicle inventory	
Make a reservation	Make a reservation	
Cancel reservation	Cancel reservation	
Update reservation	Update reservation	
Pickup vehicle	Add vehicle	
Return vehicle	Remove vehicle	
Pay bill	Modify vehicle	
	Update log	

Relationships: Include

1. When a car is returned, the bill is paid, indicating that 'Return vehicle' includes 'Pay bill'.

Relationships: Extend

○ Each time a reservation is initiated, details such as rental insurance, additional driver, service, and equipment need to be included. Hence, the 'Add RSA,' 'Add additional driver,' 'Add service,' and 'Add equipment' use cases extend the functionality of 'Make a reservation'.

Final UCD

Class Diagram