

ENSF 614 Term Project

Design Report

Group 5

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System Description for AcmePlex

AcmePlex is an advanced, integrated cinema booking platform designed to provide users with a seamless and efficient experience for managing their movie outings. The system is divided into a **front-end presentation layer** powered by React and a **back-end service layer** developed using Spring Boot, ensuring a robust and scalable architecture.

Key Features

User Management

- **Registration & Login:** Users can register and securely log in to their accounts.
- **Exclusive Member Features:**
 - Registered users enjoy early access to tickets.
 - No admin fee for cancellations.
 - Notifications for upcoming releases and exclusive member-only announcements.
 - Registered users pay a **\$20 annual membership fee** to maintain access to exclusive benefits.

Guest Users

- **Checkout Without Registration:** Guest users can browse and book tickets without creating an account.
- **Cancellation Policy for Guests:** Guest users pay a **15% admin fee** on cancellations, regardless of the cancellation timing.

Search and Discovery

- **Movie Search:** Users can search for movies by title.
- **Theatre Search:** Users can view theatres and their offerings.

Showtime Management

- Users can view movie showtimes by date and theatre.
- Exclusive showtimes are available for registered members before public bookings, communicated via a **pre-public announcement email** containing a special link for early access.

Seat Selection

- Users can view available seats in real-time and select their preferred seats based on availability.

Payment and Ticketing

- **Payments:** Payments are processed through credit card integrations.
- **Ticket Confirmation:** Automatic email confirmations are sent to users with detailed ticket information, including movie name, showtime and theatre

Booking Management

- Users can view, manage, or cancel their bookings.

Admin Management

- Administrators can add new movies through an admin sign-in page, which automatically notifies the observer in the backend to send an email to registered users.

Architecture Overview

1. Frontend (React):

- The user interface allows users to interact with the system seamlessly.
- Key Pages:
 - **Home Page:** Displays featured movies and search options.
 - **Search Pages:** Allow users to find movies and theatres.
 - **Booking Pages:** Guides users through seat selection and payment.
 - **Booking Management:** Enables user registration, login, and management of bookings.

2. Backend (Spring Boot):

- The backend API serves as the core of the system, processing business logic and managing data.
- Key Controllers:
 - **MovieController:** Manages movie information and search functionalities.
 - **TheatreController:** Provides details about theatres and their showtimes.
 - **ReservationController:** Handles booking creation, cancellation, and management.
 - **SeatController:** Manages seat availability and allocation.
 - **UserController:** Oversees user registration and authentication.

3. Database:

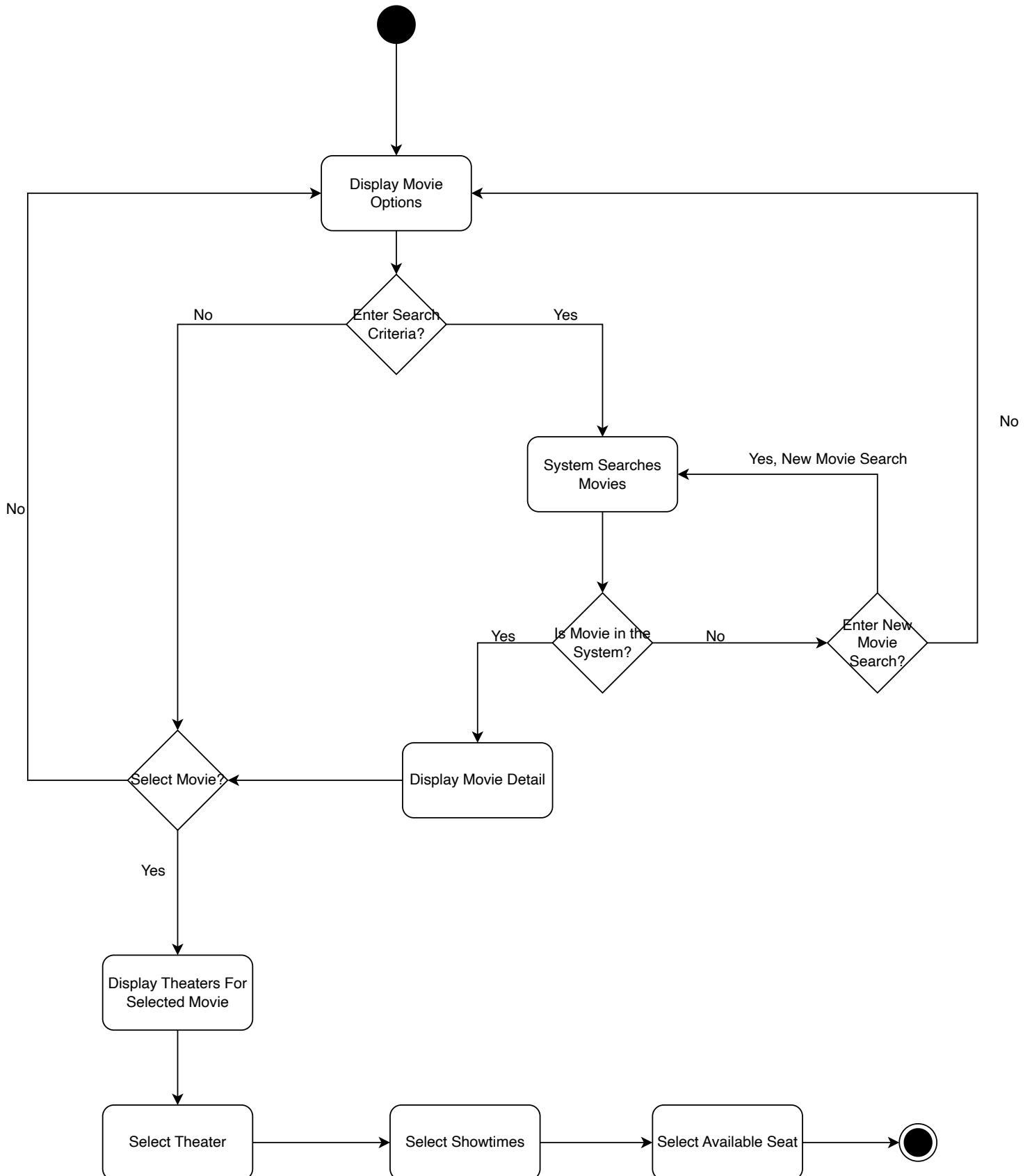
- Relational database storing movies, theatres, showtimes, users, reservations, and seat details.

Technologies Used

- **Frontend:** React, TypeScript, CSS Frameworks
- **Backend:** Spring Boot, Java
- **Database:** MySQL
- **Email Service:** Integrated using Thymeleaf templates
- **Version Control:** Git, GitHub

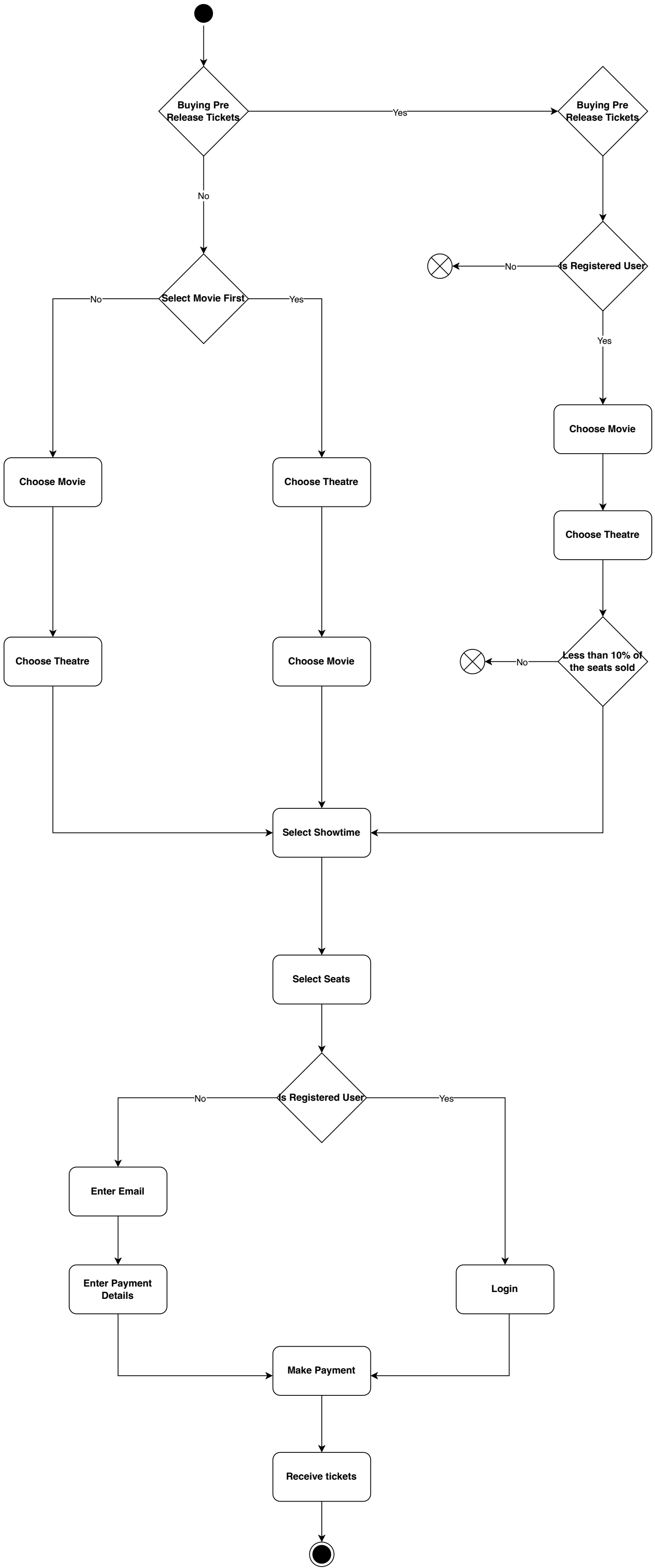
System Activity Diagram

Browsing and Selecting a Movie



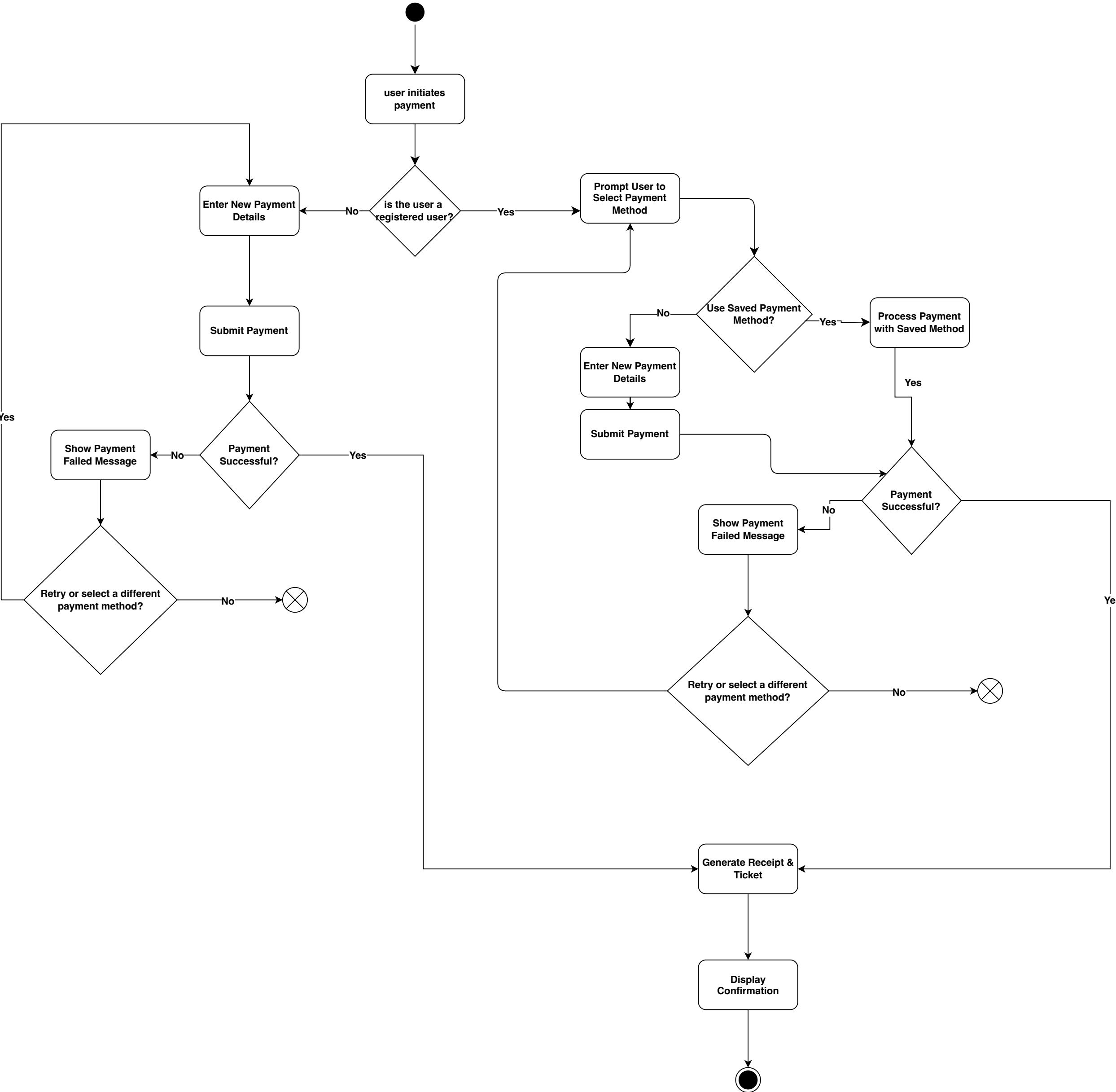
System Activity Diagram

Booking Ticket

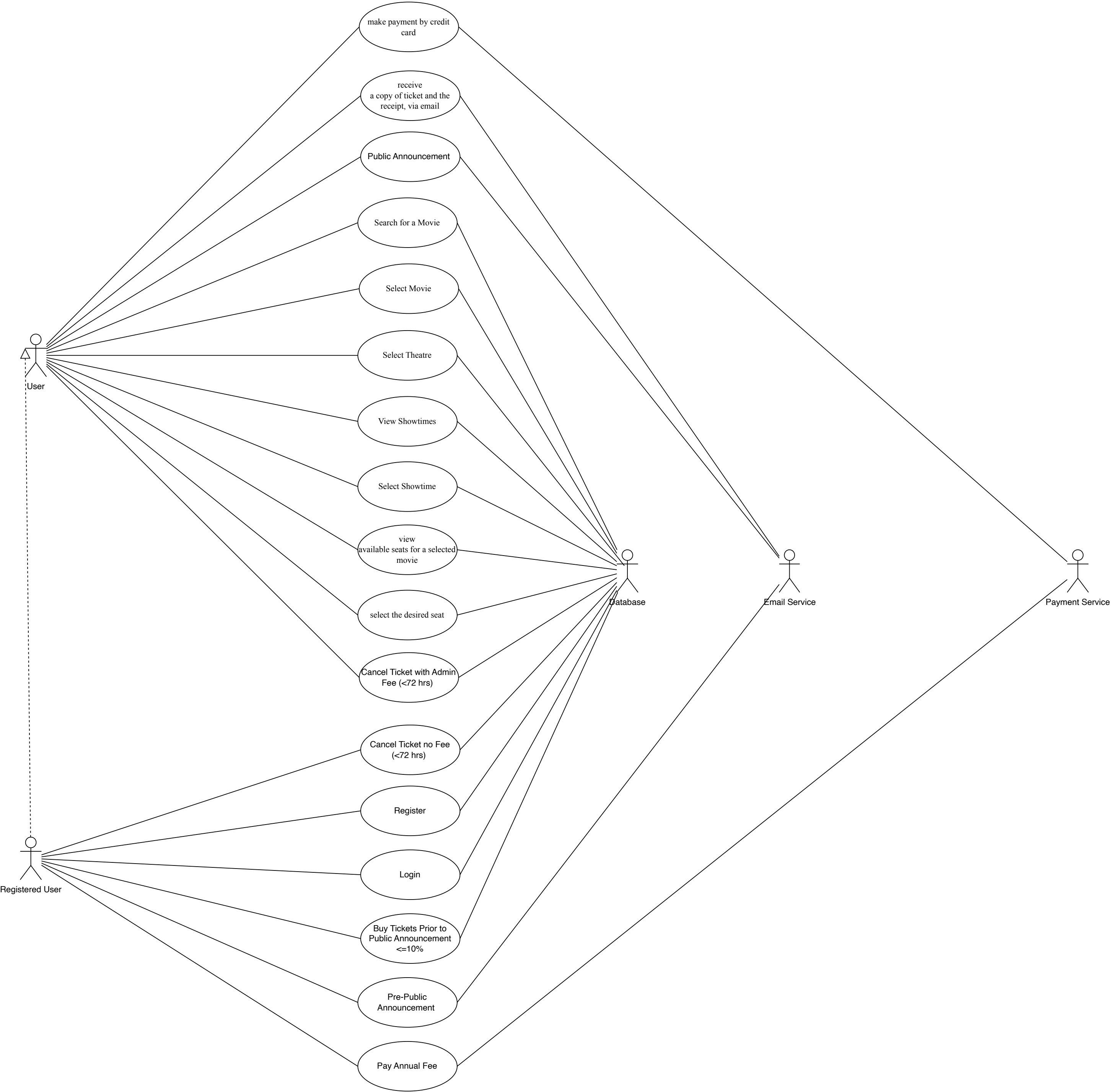


System Activity Diagram

Making Payment



Use Case Diagram



System Scenarios

Scenario 1: Use Case "Make Payment"

This scenario starts when the User has selected their movie, theater, showtime, and seats. The AcmePlex application displays the payment options/confirm your tickets page, where the User reviews the total cost and selects a payment method as a Guest. The User also has the option to sign in if they are a Registered User and they can checkout with their existing credit card/ payment information. The User can also create an account and become a Registered User. If not, the User enters their payment information, including card details and submits the payment. The system processes the payment securely, and if successful, sends a receipt, and a ticket to the User's email, and shows a booking confirmation screen with ticket and payment Information.

Scenario 2: Use Case "Search for a Movie"

The scenario starts when the User wants to find a specific movie. The AcmePlex App displays a search bar where the User enters movie title or keywords. The App searches for movies that match the keywords and displays a list of results for the User to select.

Scenario 3: Use Case "Select a Movie"

The scenario starts when the User wants to watch a movie at AcmePlex. The User browses a list of available movies and selects the movie they want to watch. The App then triggers the next scenario.

Scenario 4: Use Case "Select Theater"

The scenario starts when the User has selected a movie. The AcmePlex App displays a list of theaters showing the selected movie. The User selects the theater they want to attend. The App then triggers the next scenario.

Scenario 5: Use Case "View Showtime"

The scenario starts when the User has selected a theater. The App displays a list of showtimes for the selected theater and movie. The User can view showtimes and then choose a specific time to proceed with.

Scenario 6: Use Case "Select Showtime"

The scenario starts when the User is viewing available showtimes. The User selects the showtime they want to attend. The App confirms the selection and triggers the next scenario.

Scenario 7: Use Case "View Available Seats for a Selected Movie"

The scenario starts when the User has selected a showtime. The AcmePlex App displays a

seating chart for the selected showtime. The User can view available seats and then select their preferred seat.

Scenario 8: Use Case “Select Desired Seat”

The scenario starts when the User is viewing available seats. The User selects the desired seat they want to book for the show. The App reserves the seat once payment is complete.

Scenario 9: Use Case “Cancel Ticket”

The scenario starts when the User decides to cancel a ticket. The User navigates to their reservation history and selects the reservation they want to cancel. The App checks if the cancellation is within 72 hours of the showtime, applies a 15% fee, and confirms cancellation. A coupon is issued to the User’s Email with a one-year expiration.

Scenario 10: Use Case “Receive a Copy of Ticket and Receipt via Email”

The scenario starts when the User has successfully made a payment. The App generates the ticket and receipt and sends a digital copy to the User’s email address. The User receives an email with the reservation information attached.

Scenario 11: Use Case “Free Cancellation for Registered User”

The scenario starts when a Registered User decides to cancel a ticket. The Registered User navigates to their reservation history and selects the ticket they want to cancel. The App checks if cancellation is within 72 hours of showtime, and waives the 15% cancellation fee. A coupon is issued to the Registered User’s Email with a one-year expiration.

Scenario 12: Use Case “Register”

The scenario starts when a new User has selected their movie, theater, showtime, and seats and wants to become a Registered User. The AcmePlex application displays an option to register as a member. The User enters their personal information such as {name} and payment details. The App saves this information in its database and confirms Registered User status, allowing access to exclusive benefits.

Scenario 13: Use Case “Login”

The scenario starts when a Registered User has selected their movie, theater, showtime, and seats and wants to log in to their account. The Registered User enters their email and password into the login form on the App. The App verifies the credentials and, if correct, grants access to the Registered User’s account which has their payment information saved.

Scenario 14: Use Case “Buy Tickets Prior to Public Announcement”

The scenario starts when a new movie is added and the Registered User receives an email to buy tickets before the general public. The Registered User browses a list of movies available for

pre-release purchase, selects a movie, theater, and showtime, then proceeds through the usual seat selection (only 10% of the seats can be selected during the pre-release purchase, on a first come first serve basis) and payment process.

Scenario 15: Use Case “Pay Annual Fee”

The scenario starts when a User creates registers to become a member of the App. The App prompts the Registered User to pay the \$20.00 annual account fee to create their account. The Registered User enters payment information and the App processes the payment. The App confirms account creation and navigates back to the login page.

Scenario 16: Use Case “Pre-Public Announcement”

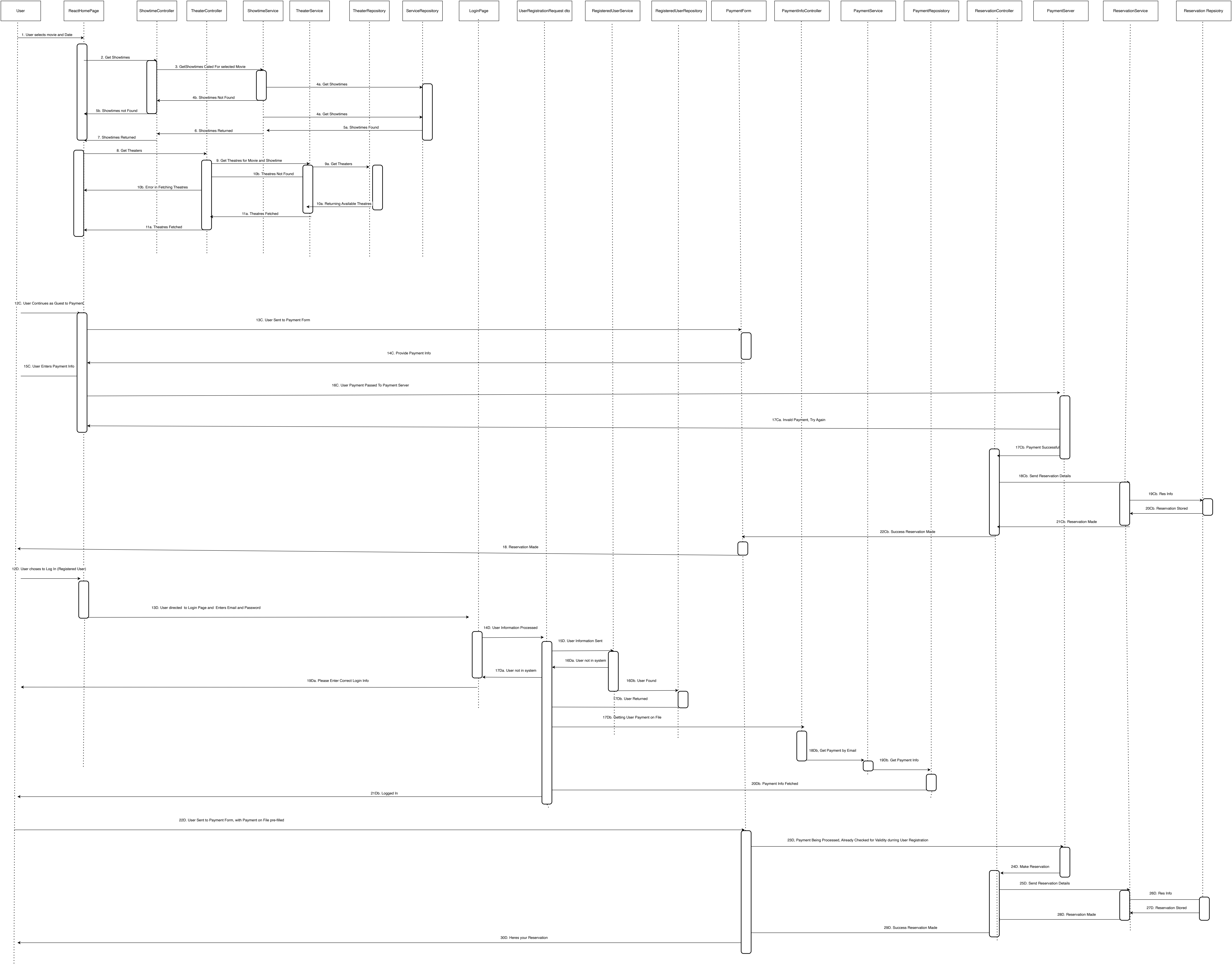
The scenario starts when AcmePlex is preparing to announce a new movie to Registered Users. The App sends a notification to all Registered Users about the upcoming movie’s release, including an option to buy tickets prior to public availability. The Registered User can view the announcement and select the movie and theater for purchase.

Scenario 17: Use Case “Public Announcement”

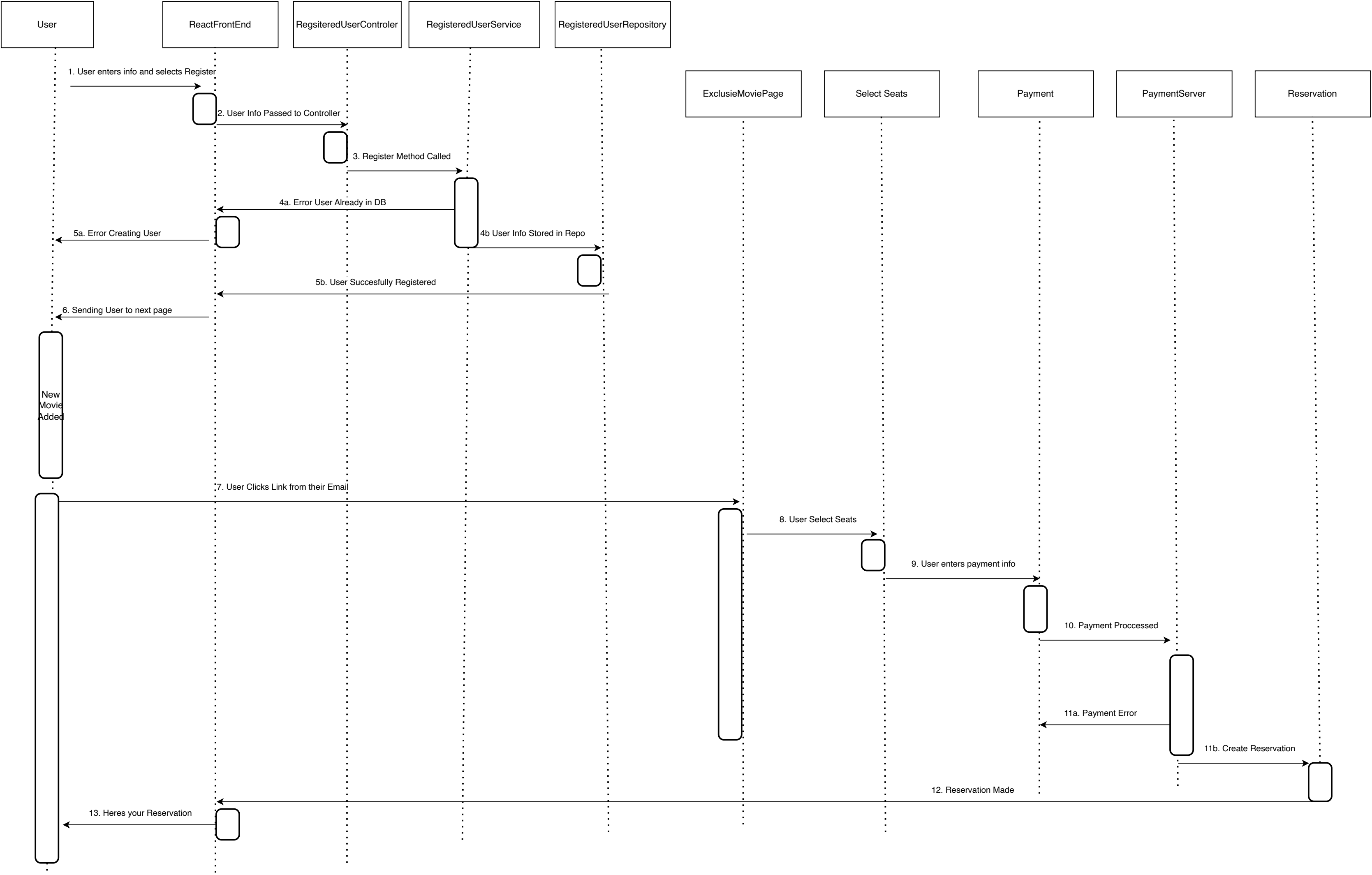
The scenario starts when AcmePlex announces a new movie to the general public. The App sends a notification to the public Users and displays the new movie in its listings, making it available to all Users. Users can now view and purchase tickets for the newly announced movie.

System Interaction Diagram
Booking a Movie

Booking A Movie by: Pahul Brar



System Interaction Diagram
Registering a User

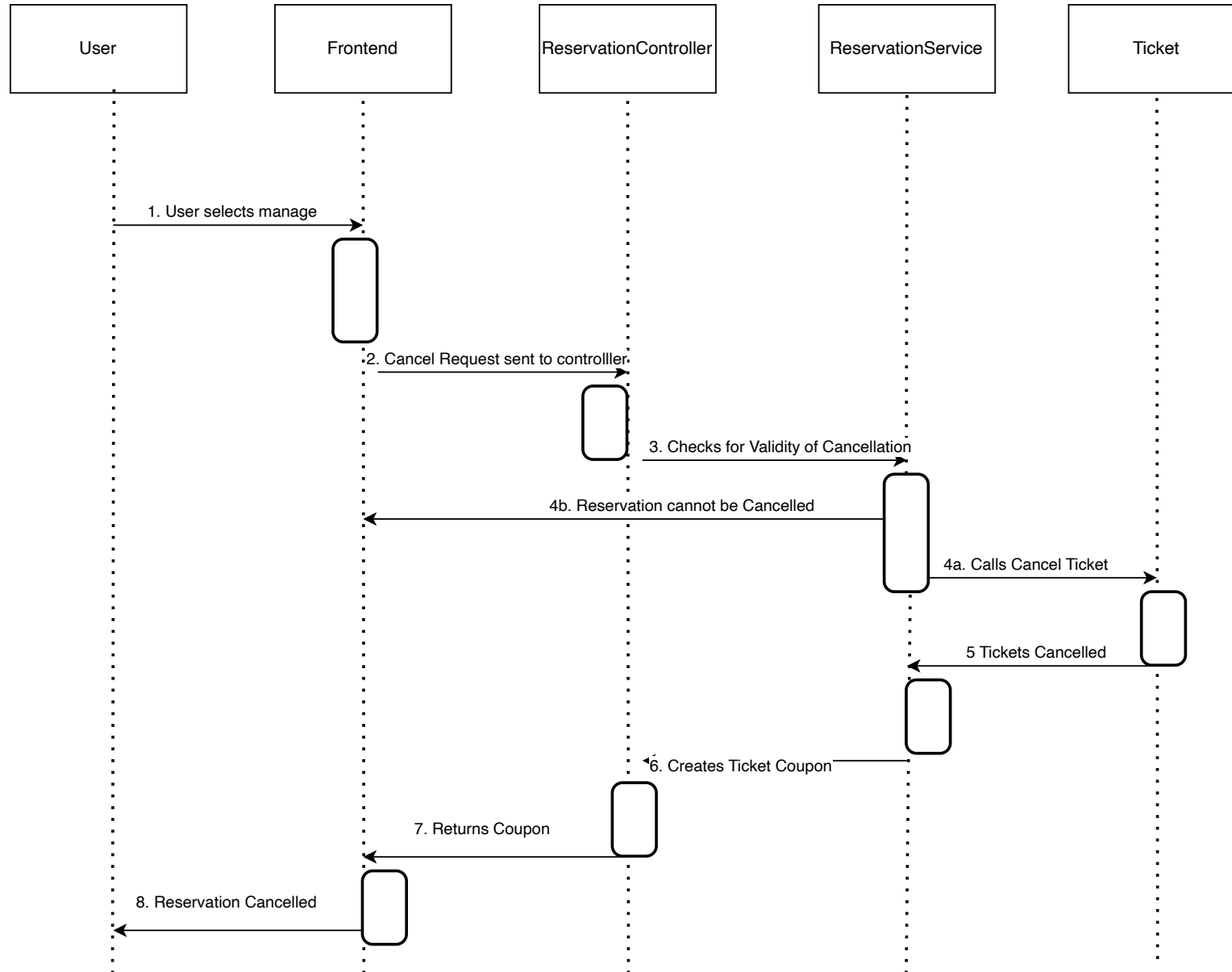


Registering A
User by:
Suchet Mangat

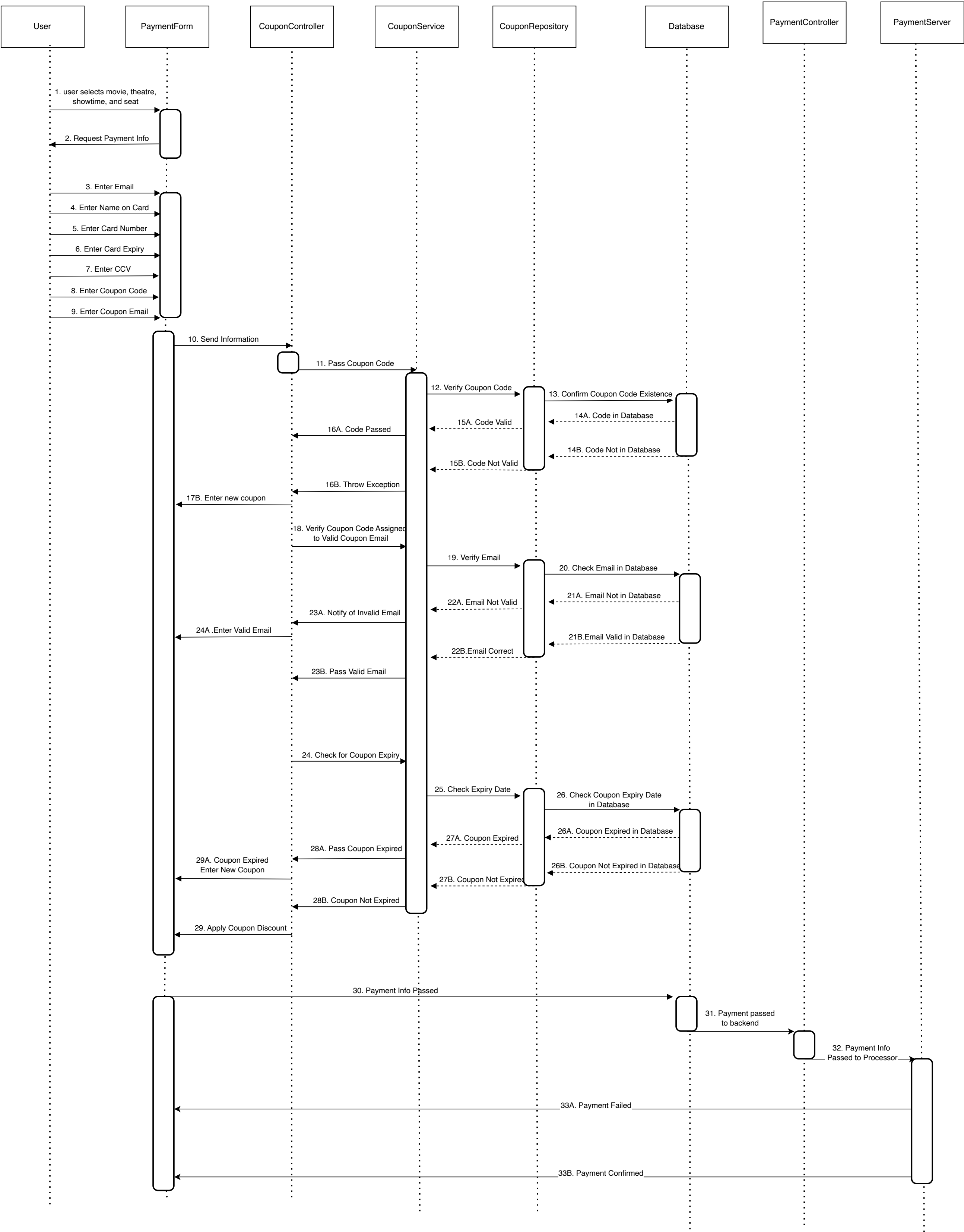
System Interaction Diagram

Cancelling a Reservation

**Cancelling A
Reservation
by: Ragib Sina**

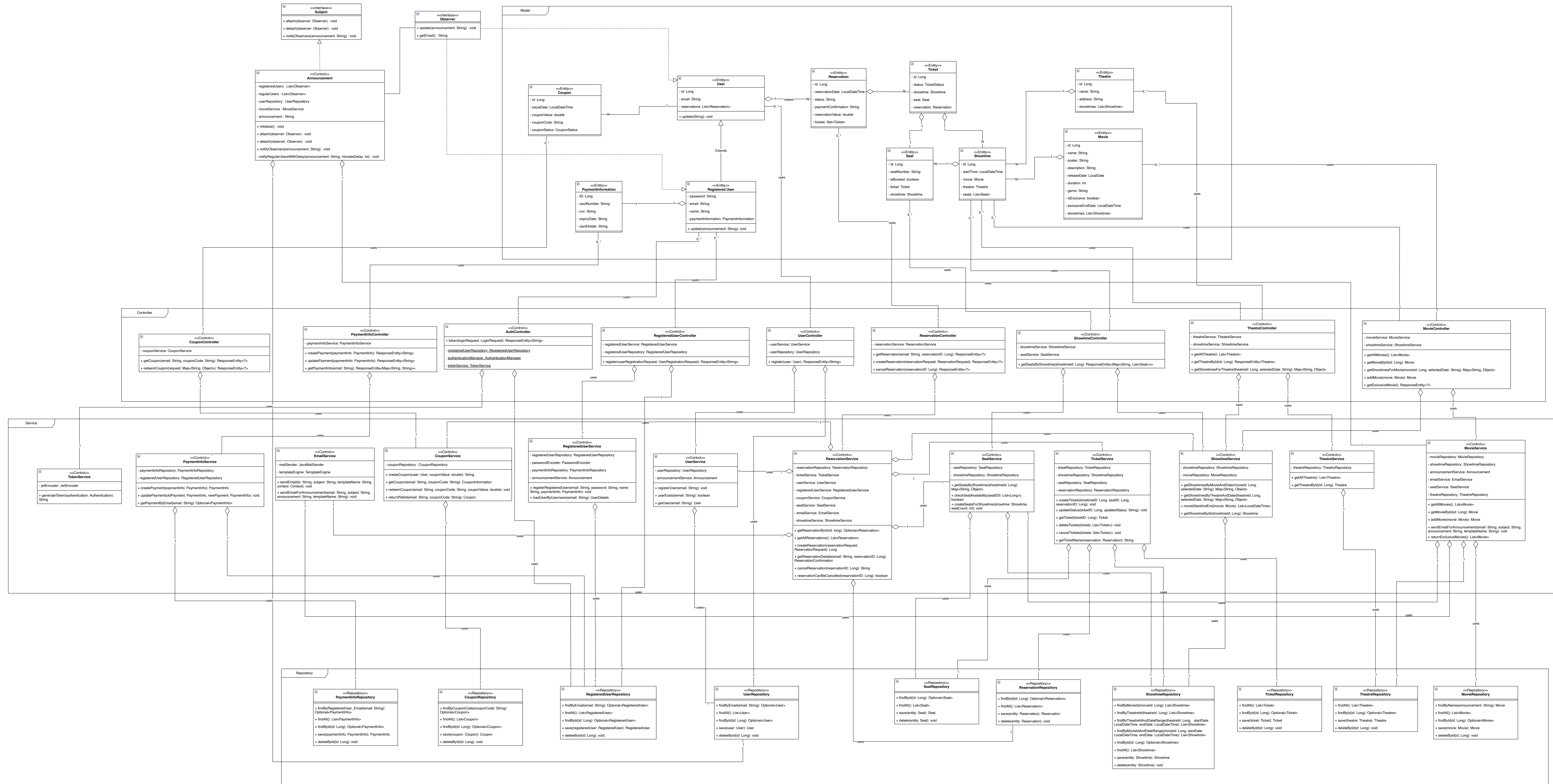


System Interaction Diagram
Making a Payment & Use Coupon



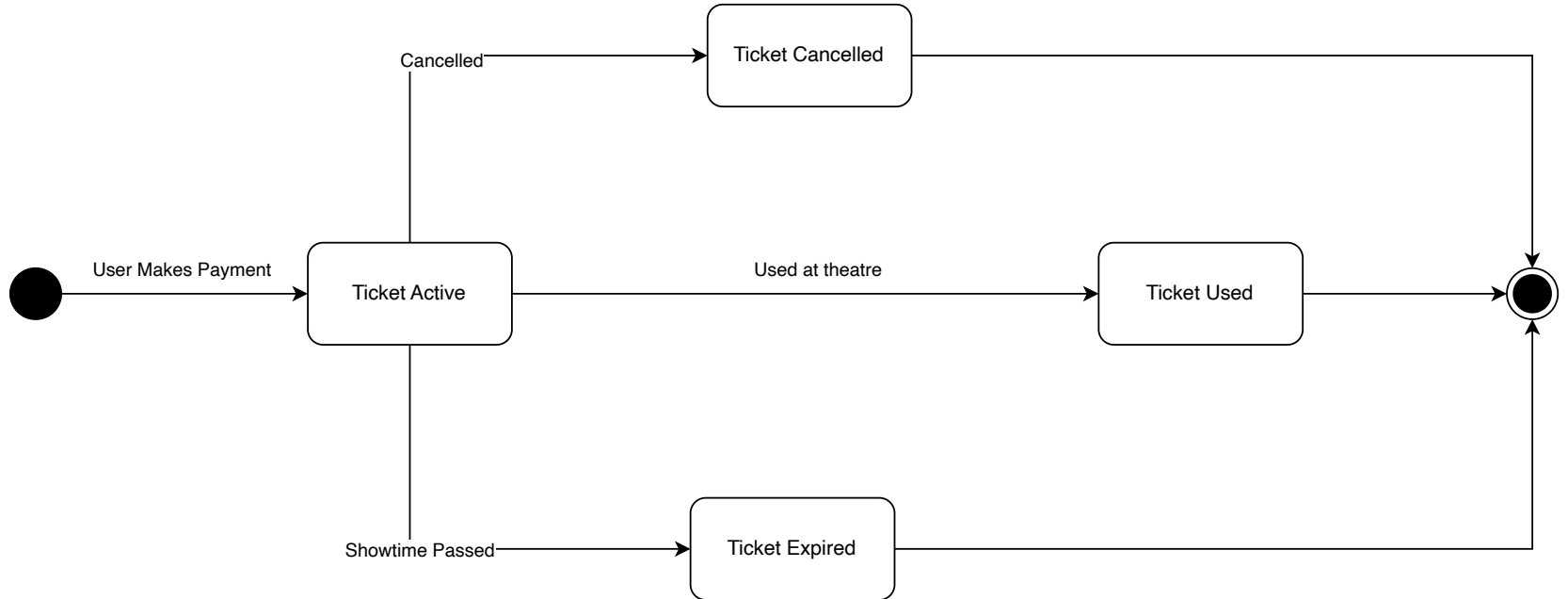
Making A
Payment & Use
Coupon by:
Heemin Kang

Domain Layer Class Diagram



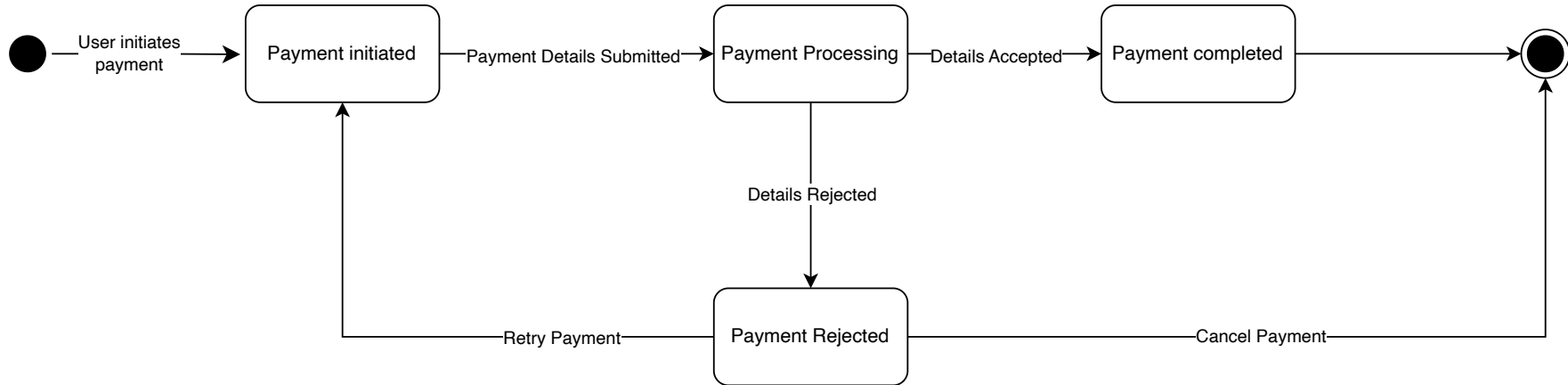
State Transition Diagram

Ticket



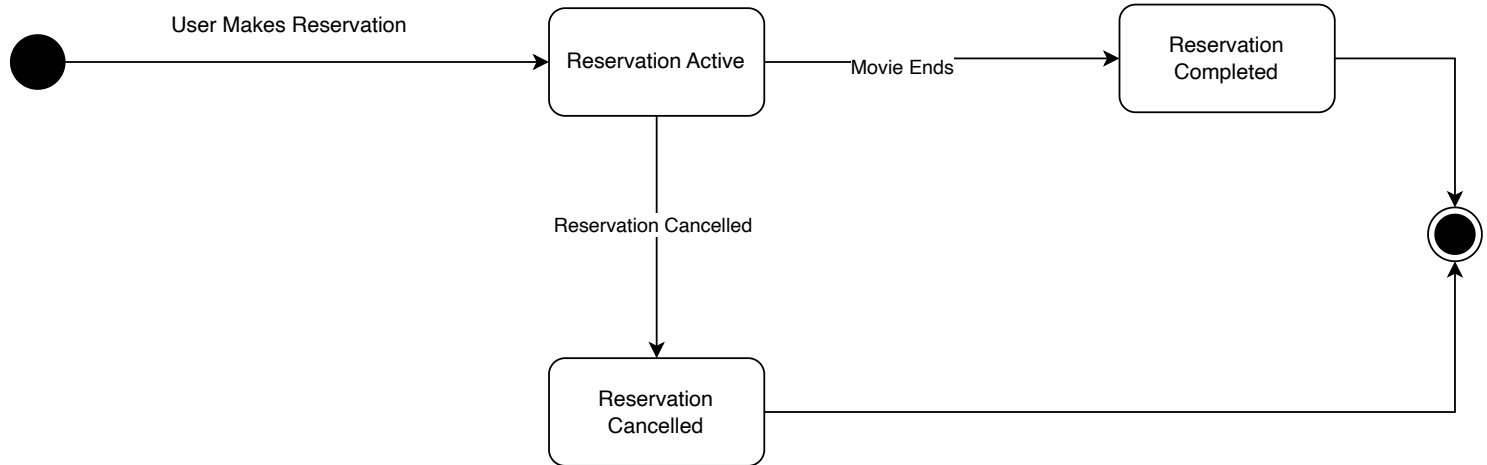
State Transition Diagram

Payment



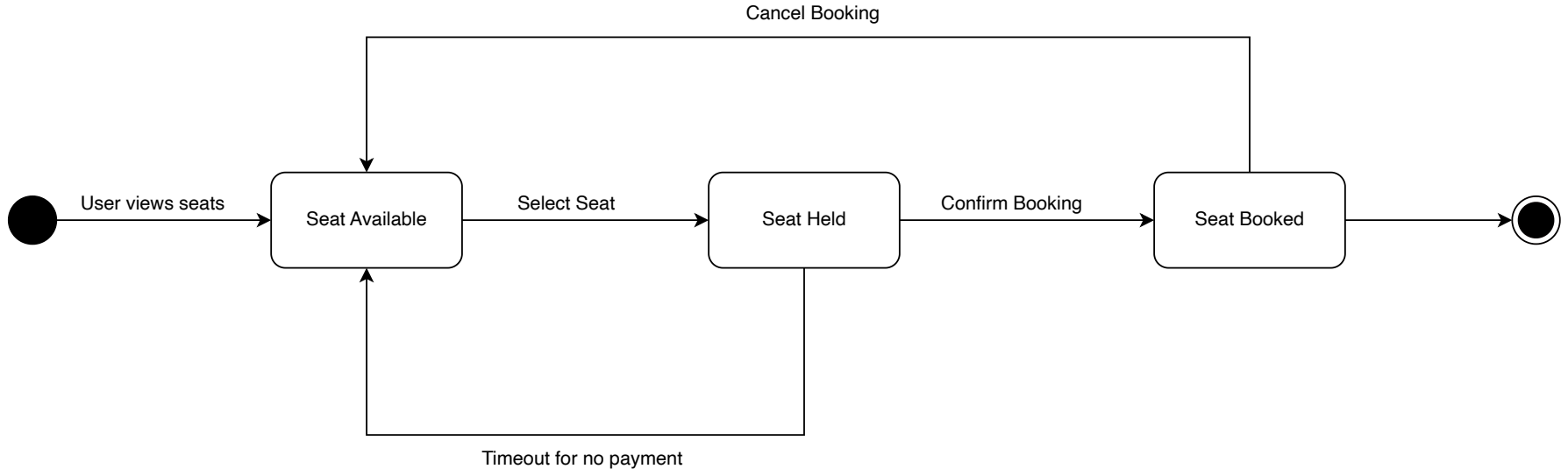
State Transition Diagram

Reservation

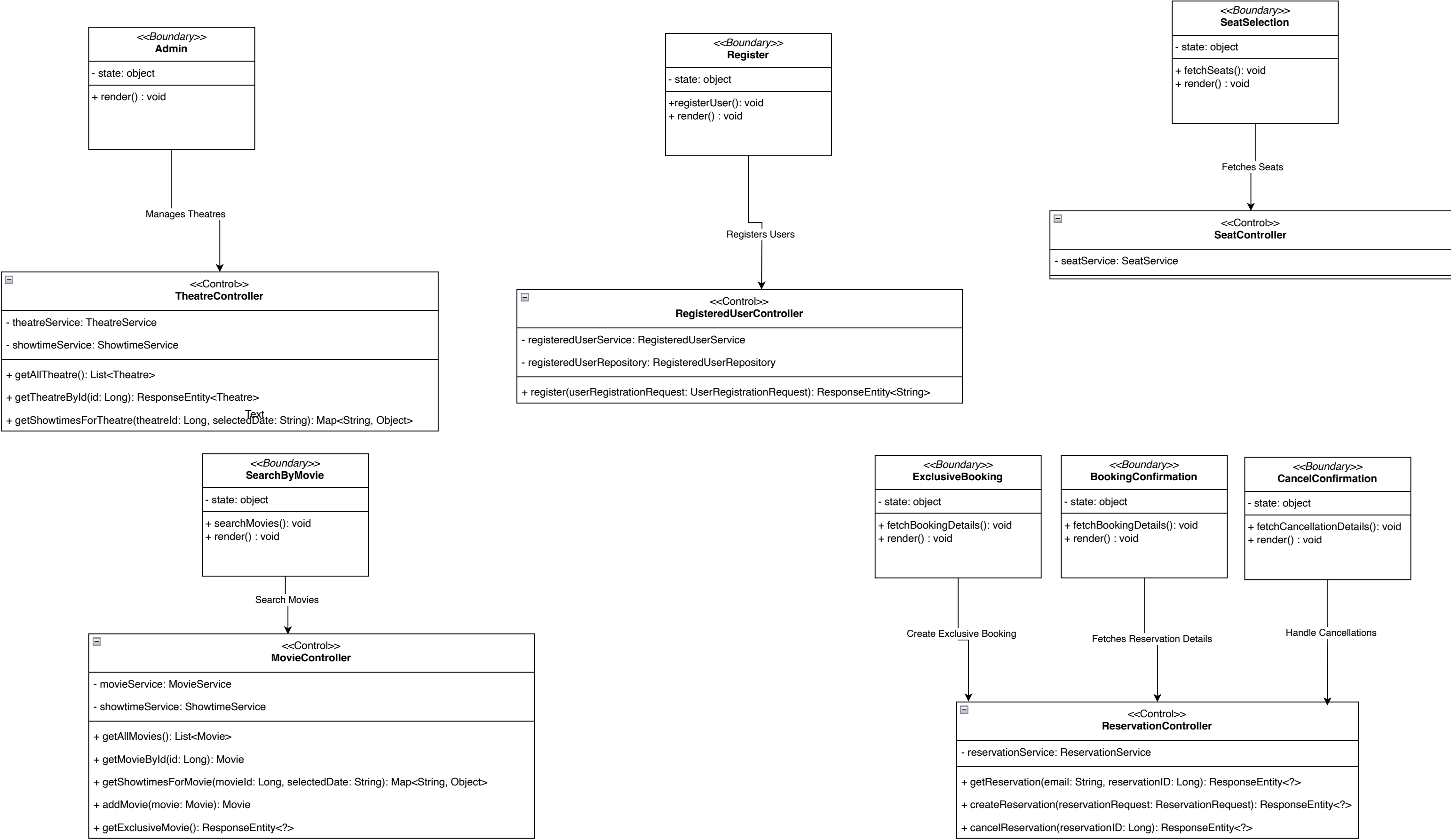


State Transition Diagram

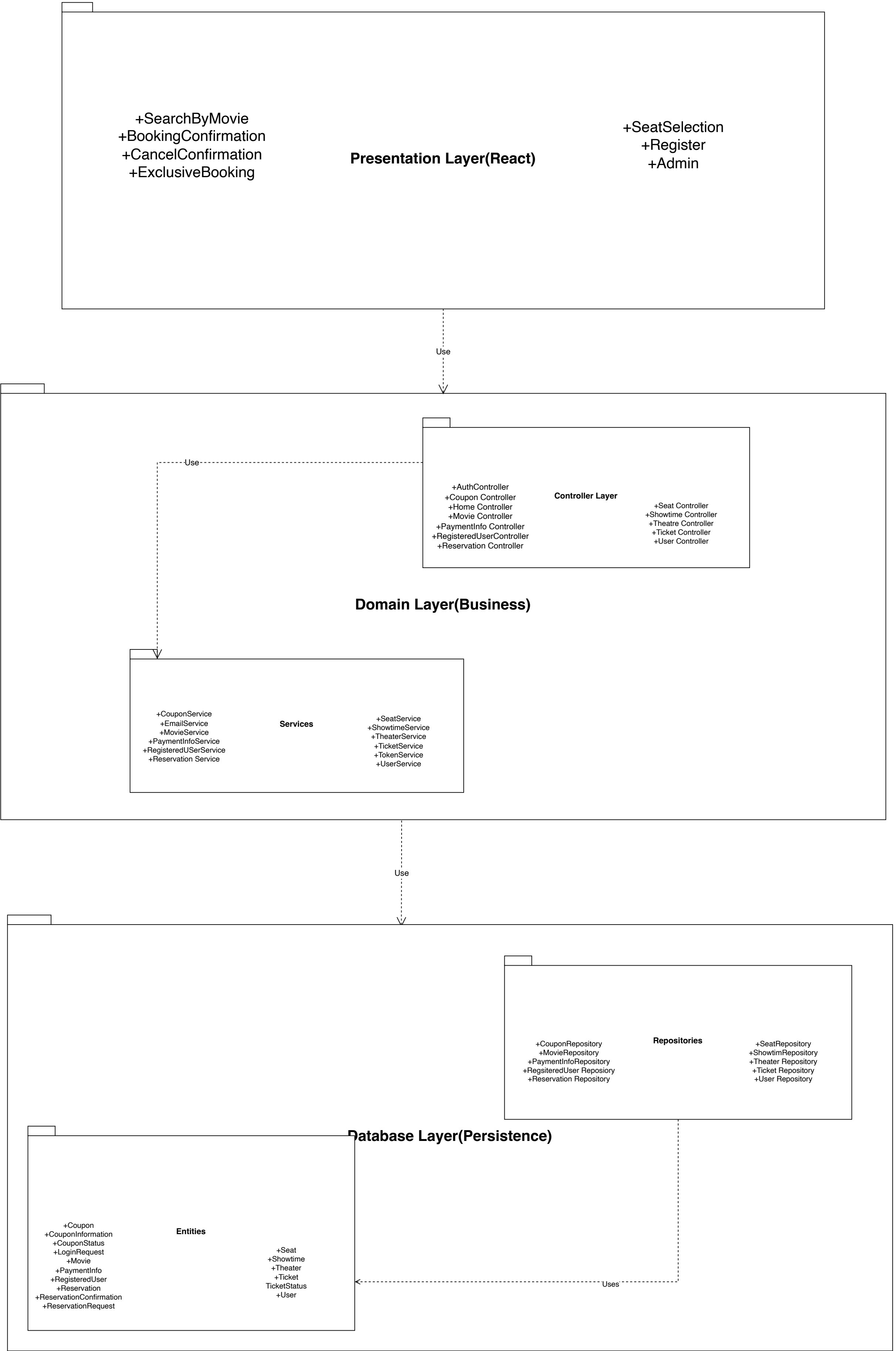
Seat



Presentation Layer Class Diagram



System Package Diagram



System Deployment Diagram

