EAST WEST UNIVERSITY

Software Design Report

ON

Airline Management System

Submitted in partial fulfillment of the requirement for the Semester **Spring 2025**

COURSE CODE: **CSE412**; SECTION: **02**

Of

BACHELOR OF SCIENCE

IN

COMPUTER SCIENCE AND ENGINEERING

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1. Introduction

- **Project Overview:**

The **Airline Management System** is a comprehensive web-based platform designed to streamline flight-related services for both passengers and administrators. This system will enable users to search, book, and manage flights with ease while offering a secure, responsive, and user-friendly interface. With features like real-time seat availability, multi-city bookings, and instant e-ticket generation, it ensures a seamless experience from flight search to final boarding. The platform integrates various filters to enhance search accuracy and supports secure payment methods, booking modifications, loyalty programs, and value-added services such as meal and baggage preferences.

Administrators will benefit from a dedicated admin panel to manage flights, monitor customer feedback, handle support tickets, and access detailed analytics on bookings, payments, and user interactions.

[To elevate user satisfaction and engagement, the system includes extraordinary features such as a machine learning-powered Price Prediction Tool and Personalized Travel Suggestions, offering data-driven insights and recommendations based on user behavior.]

The platform is built to handle high volumes of traffic and transactions efficiently, with encrypted password storage, regular backups, and smooth performance under load. By combining functionality, security, and smart travel solutions, this system aims to modernize and optimize the entire air travel experience.

- **List of Requirements**

Functional Requirements (FRs):

1. Users should be able to register and log in securely.

2. The system shall support flight search with filters such as date, time, class, destination, and airline.

3. The system shall display real-time seat availability for selected flights.

4. The system shall allow users to book flights and receive e-tickets instantly upon payment.

5. The system should support multiple secure payment options.

6. The system shall allow users to cancel or modify bookings and handle refunds as per the policy.

7. Passengers should receive notifications for booking confirmations.

8. The system shall provide extra baggage and meal preference options during the booking process.

9. The system should include a loyalty program for frequent flyers.

10. The system shall allow users to view travel history and manage their bookings.

11. The system should support the use of offers, discounts, and promo codes during booking.

12. The system shall provide a Flight Status Dashboard displaying real-time updates (on-time, delayed, canceled) and send alerts to users.

13. The system shall support multi-city flight bookings.

14. The system shall allow users to submit feedback and rate their experience.

15. The system shall provide information about baggage policies and airport facilities.

16. The system shall allow hotel bookings to be made along with or independent of flight reservations.

17. The admin panel shall allow administrators to add, update, and cancel flights.

18. The admin panel shall enable management of customer support tickets.

19. The admin panel shall display customer feedback and reviews for action.

20. The admin panel shall provide analytics on Bookings, Payments, Flight status, Revenue breakdown and payment methods, Customer support (e.g., query distribution, resolution time)

Non-Functional Requirements (NFRs):

1. The system shall run on the web.

2. The passwords shall be encrypted by the system.

3. It shall work fluently in case of many users and data.

4. The website shall have a user-friendly interface that is easy to navigate.

5. The system shall provide regular backups to prevent data loss.

6. It shall maintain the transactions flawlessly so that no error occurs.

7. The website shall respond to user requests within a specified time to get a smooth experience.

Extraordinary Requirements (Wow Factors):

1. The system should include a Price Prediction Tool that uses machine learning to suggest the cheapest times to book flights.

2. The system should provide Personalized Travel Suggestions based on a user's past behavior and preferences.

- **Technology Stack (Programming languages, frameworks, databases)**

Frontend: HTML, CSS, JavaScript (Bootstrap for styling) / React js

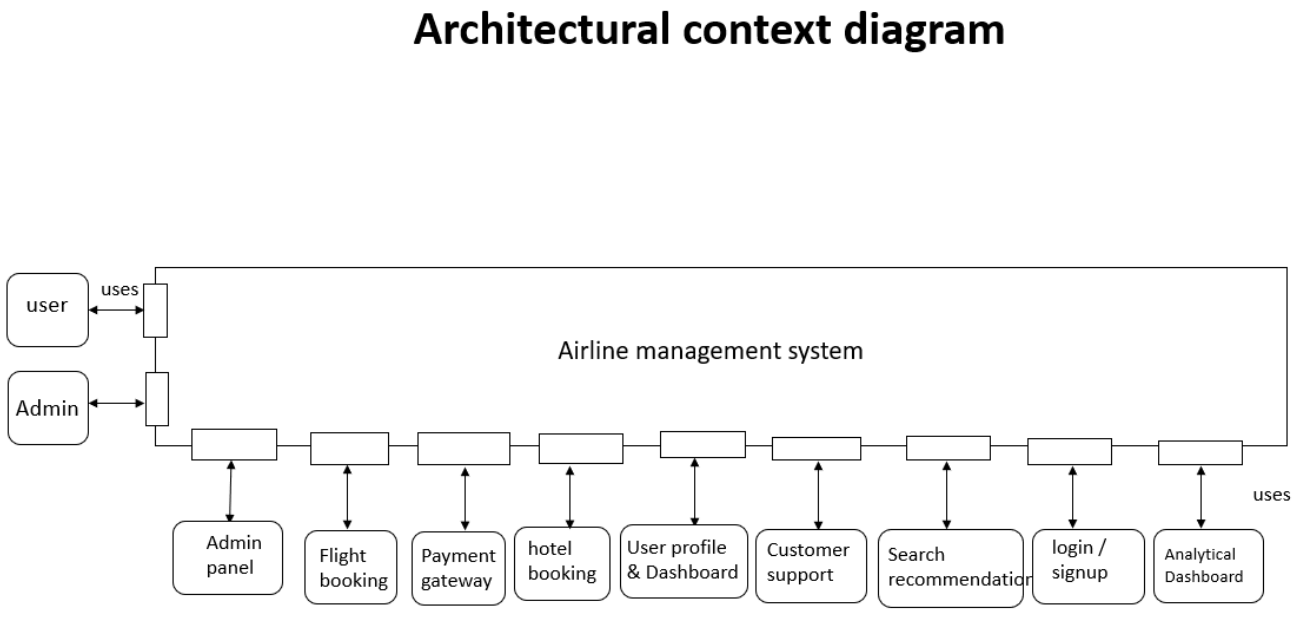
Backend: PHP / Express js

Database: MySQL/ MongoDB

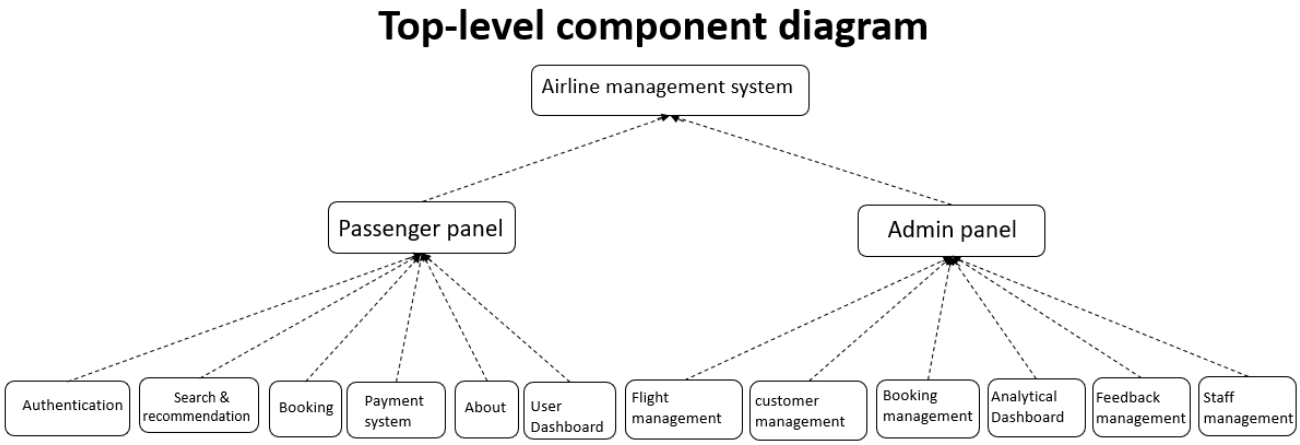
Other Tools: AJAX, jQuery, GitHub for version control, XAMPP for local testing

2. Architectural Design

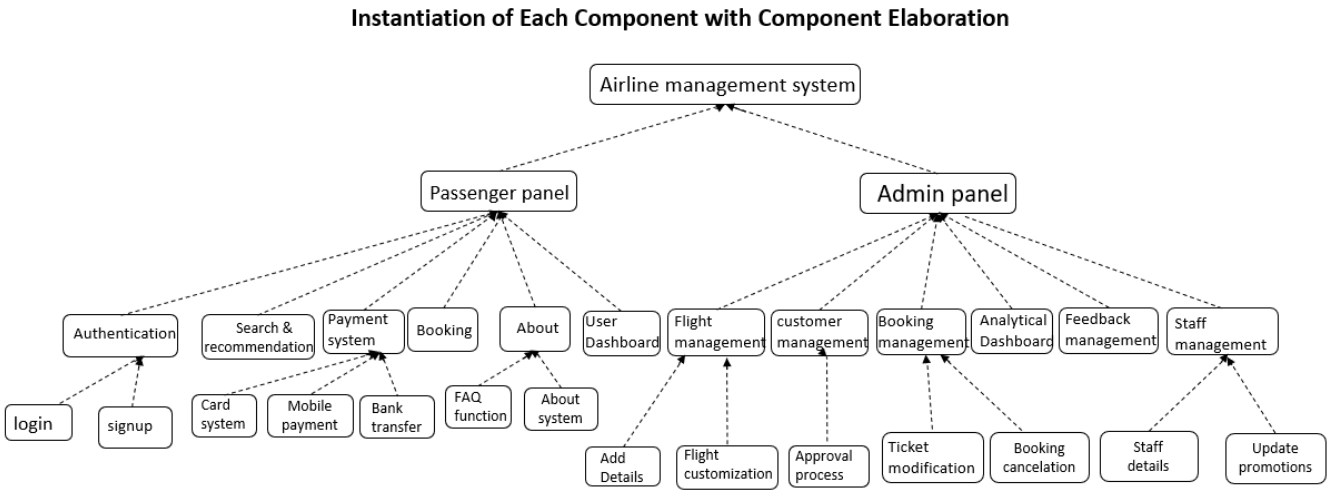
- **Architectural Context Diagram**



- **Top-Level Component Diagram**



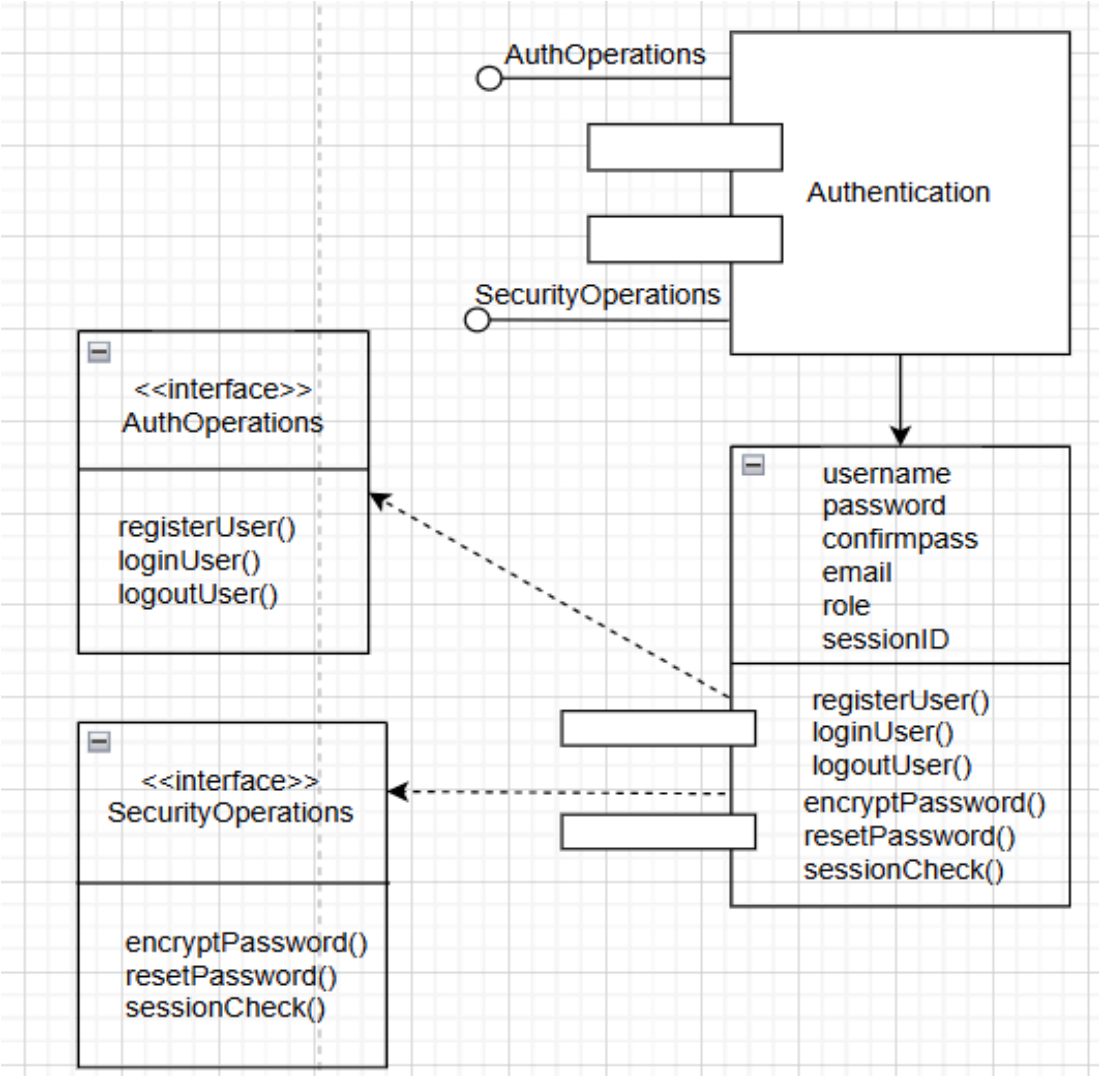
- **Instantiation of Each Component with Component Elaboration**



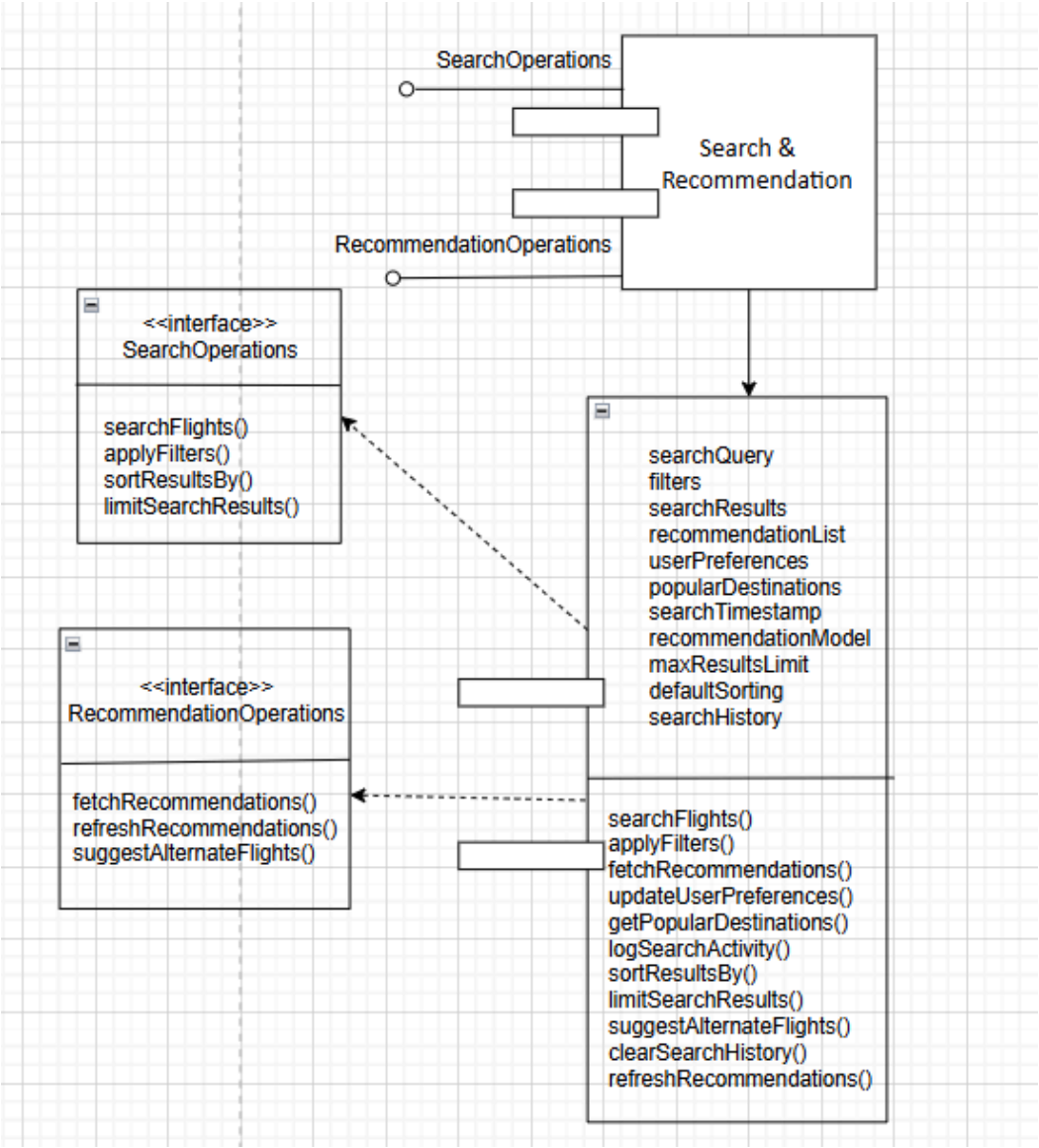
3. Component-Level Design

- **Elaboration of Design Components**

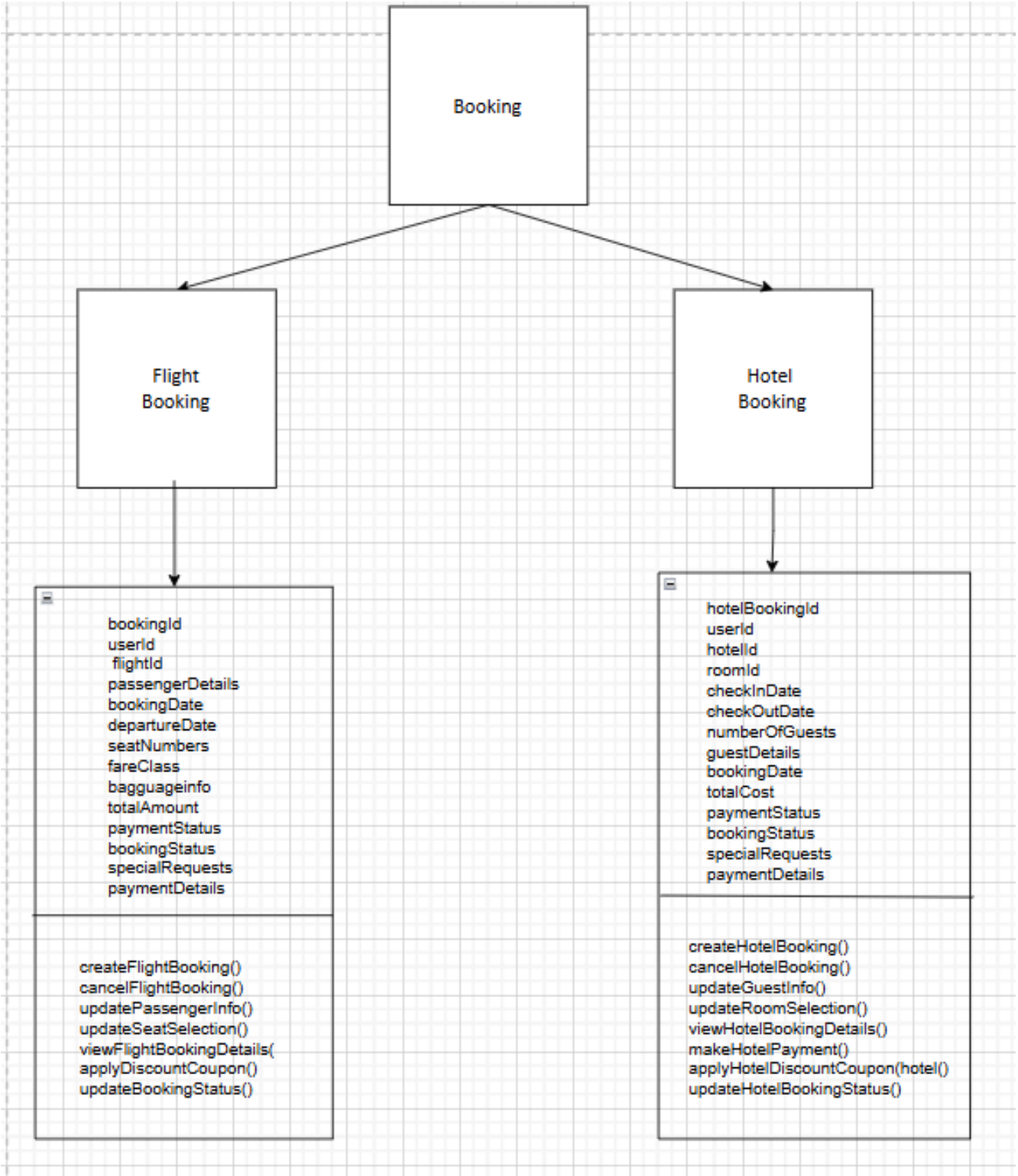
1. Authentication Component



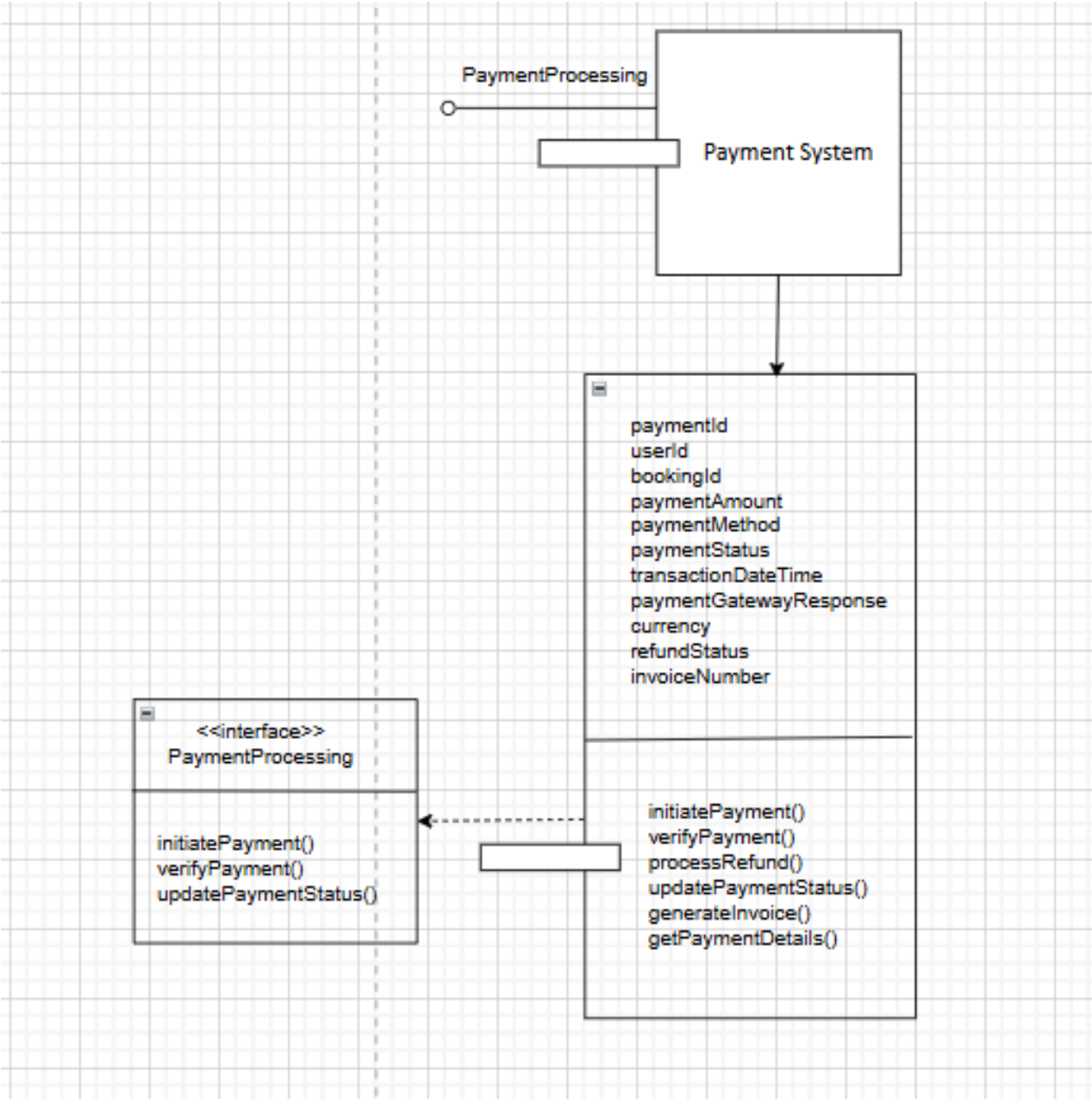
2. Search & Recommendation Component



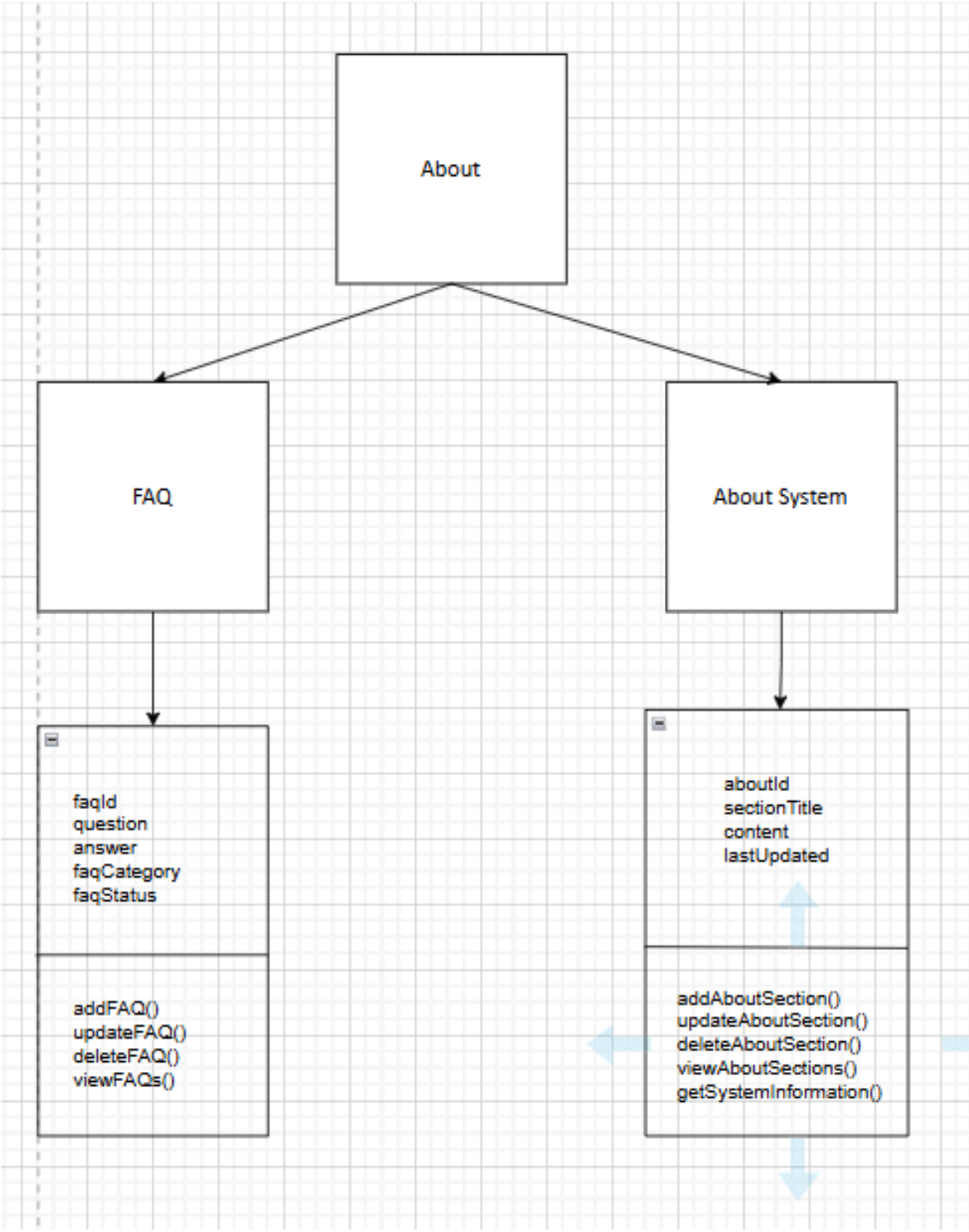
3. Booking Component



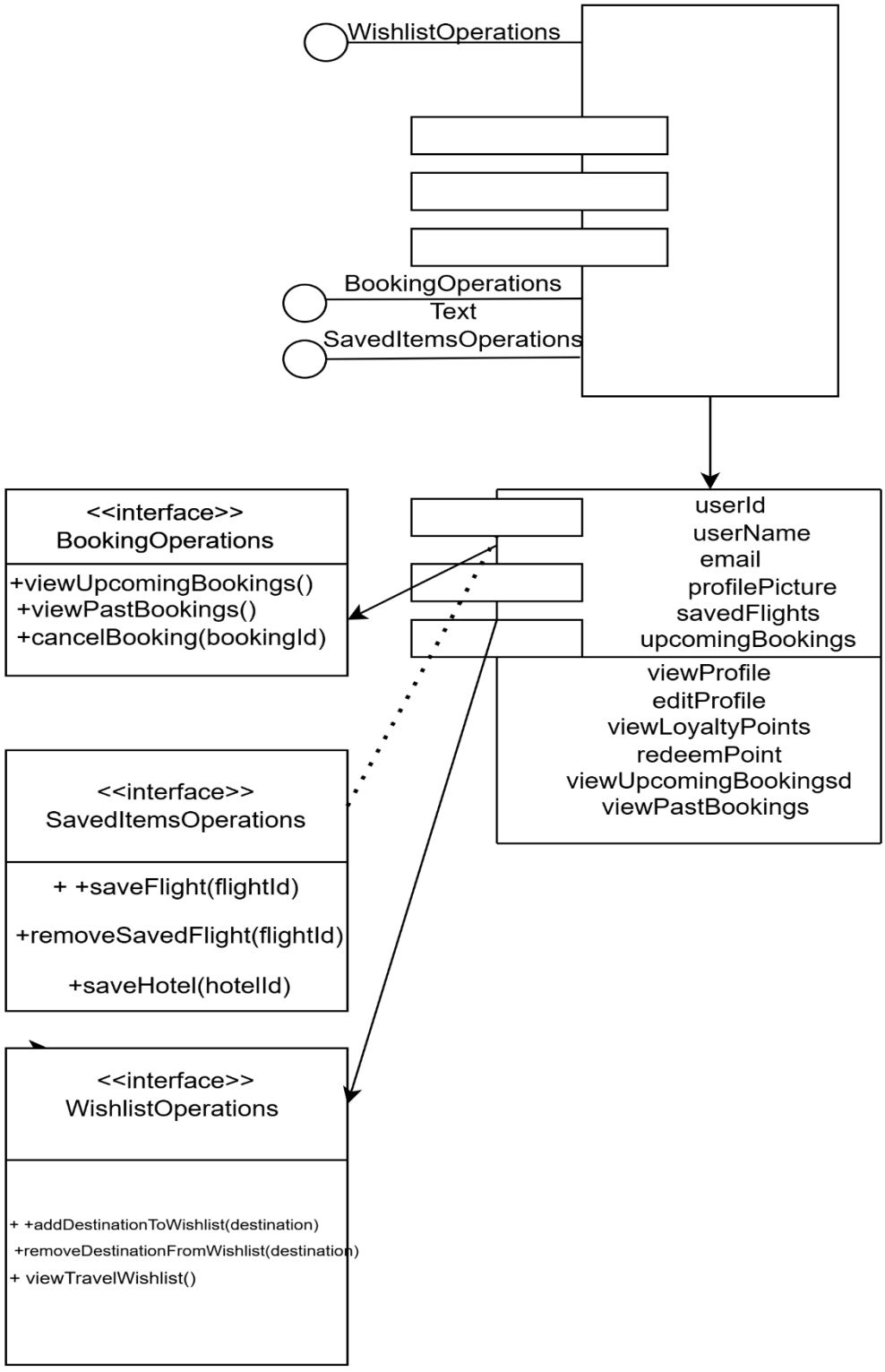
4. Payment Component



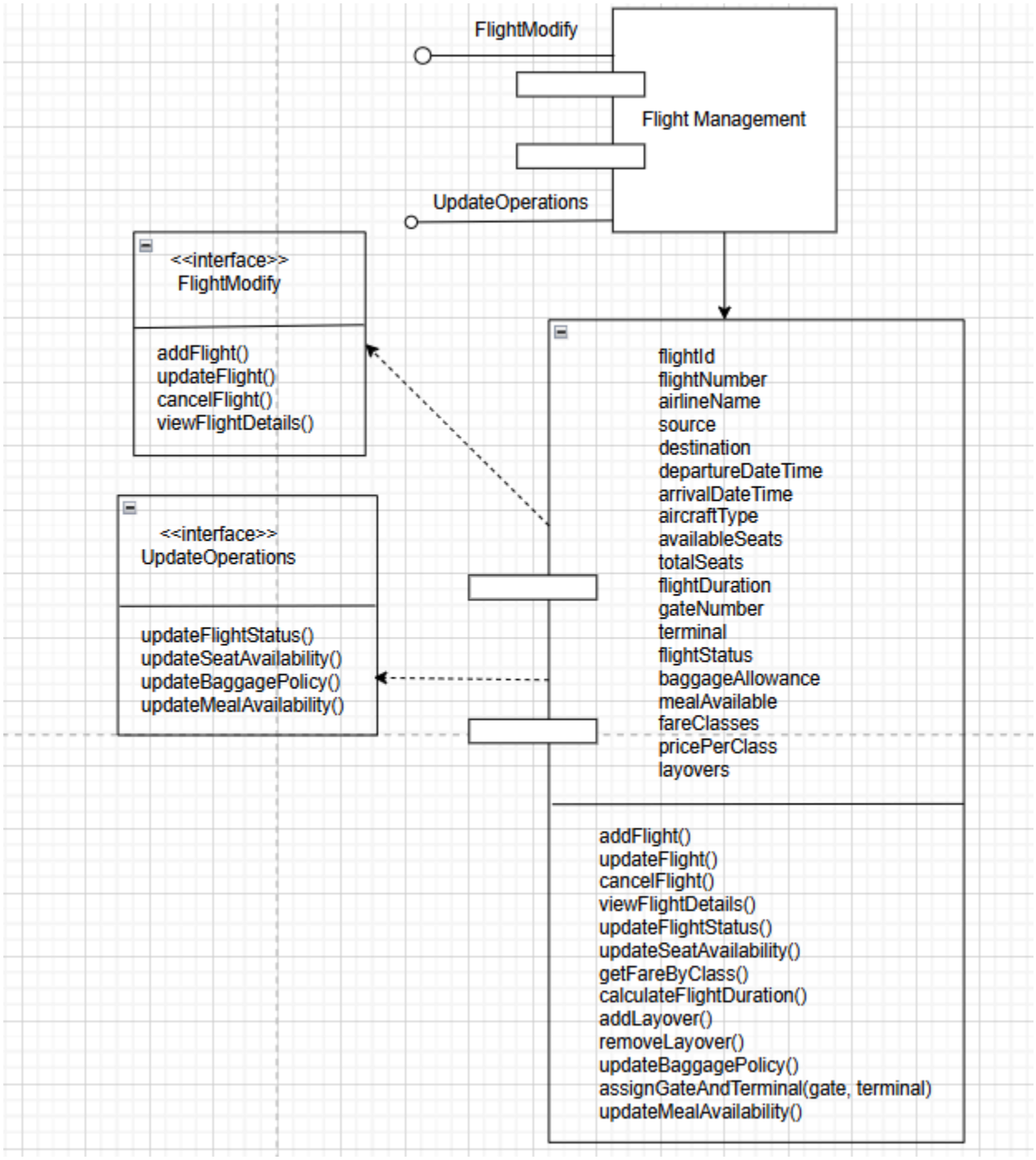
5. About Component



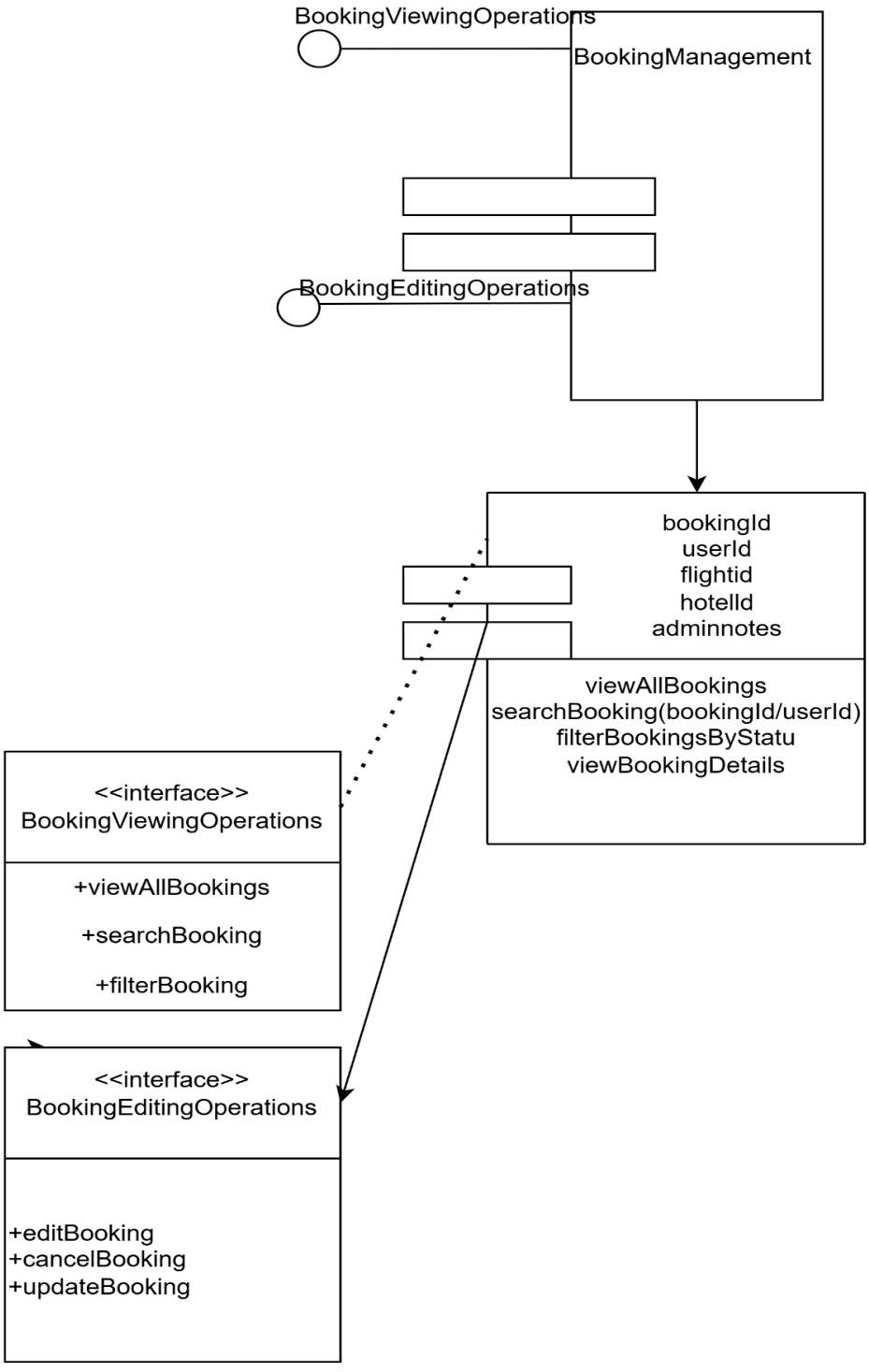
6. User Dashboard Component



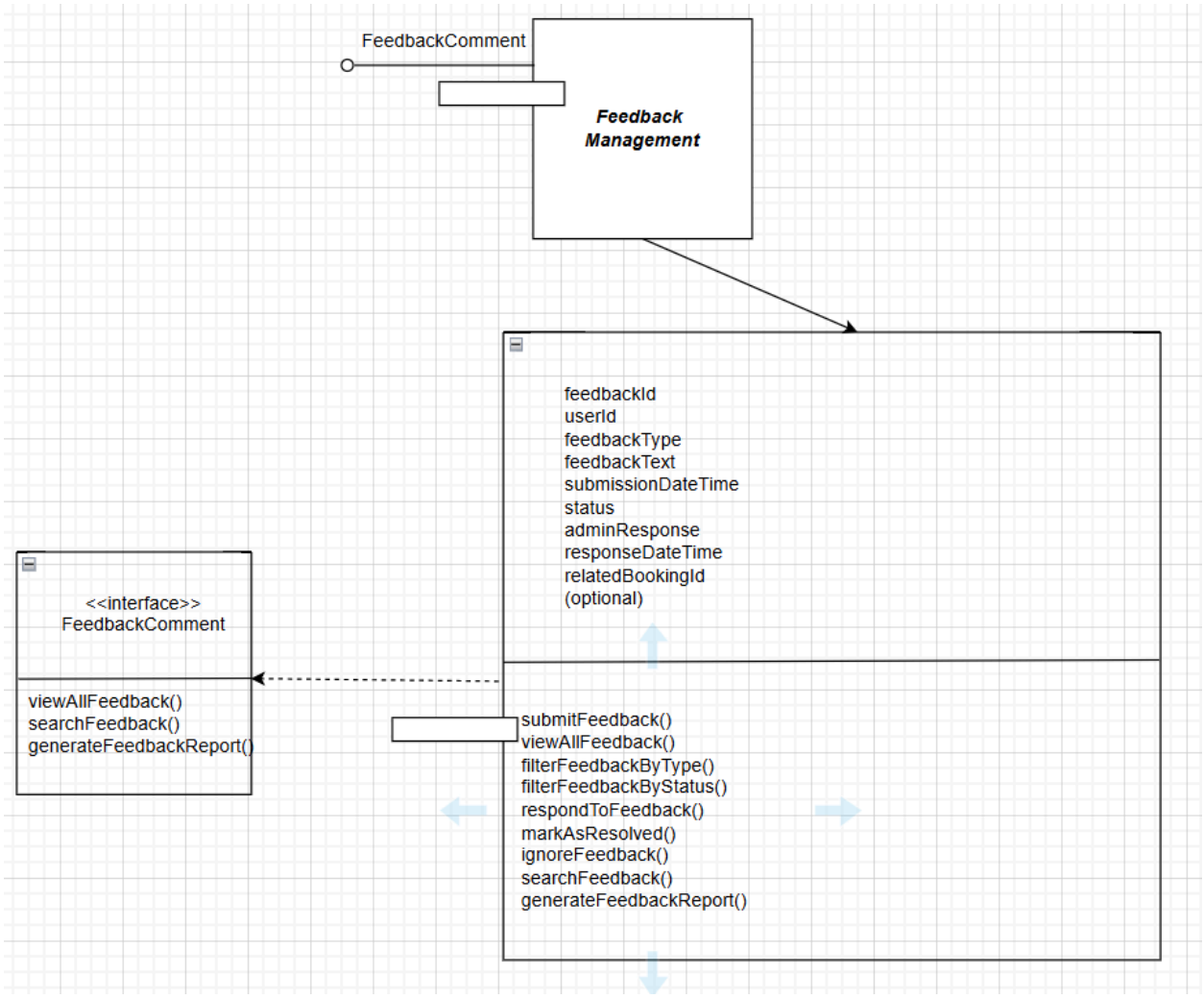
7. Flight Management Component



8. Booking Management Component

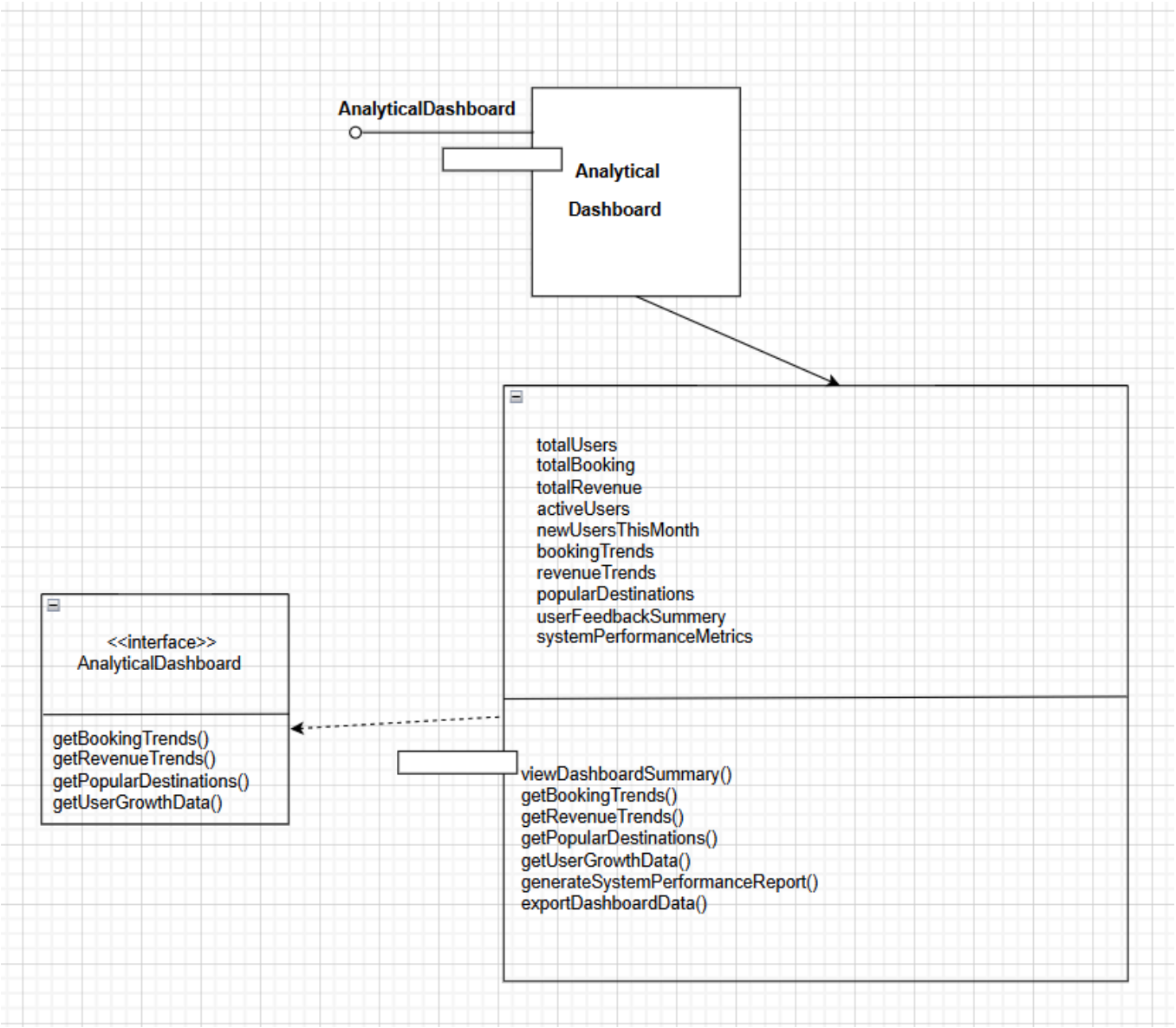


9. Feedback Management Component

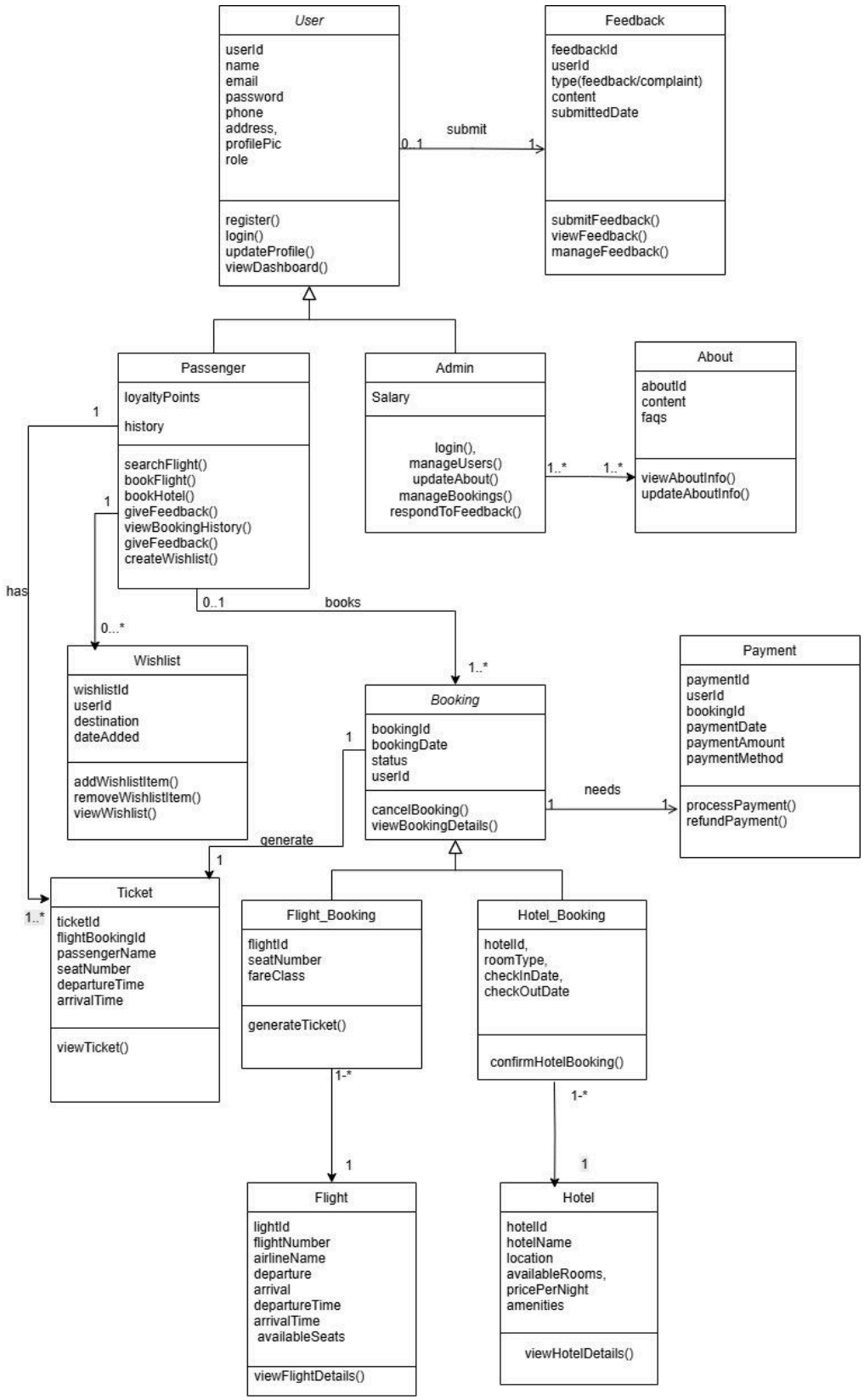


10.

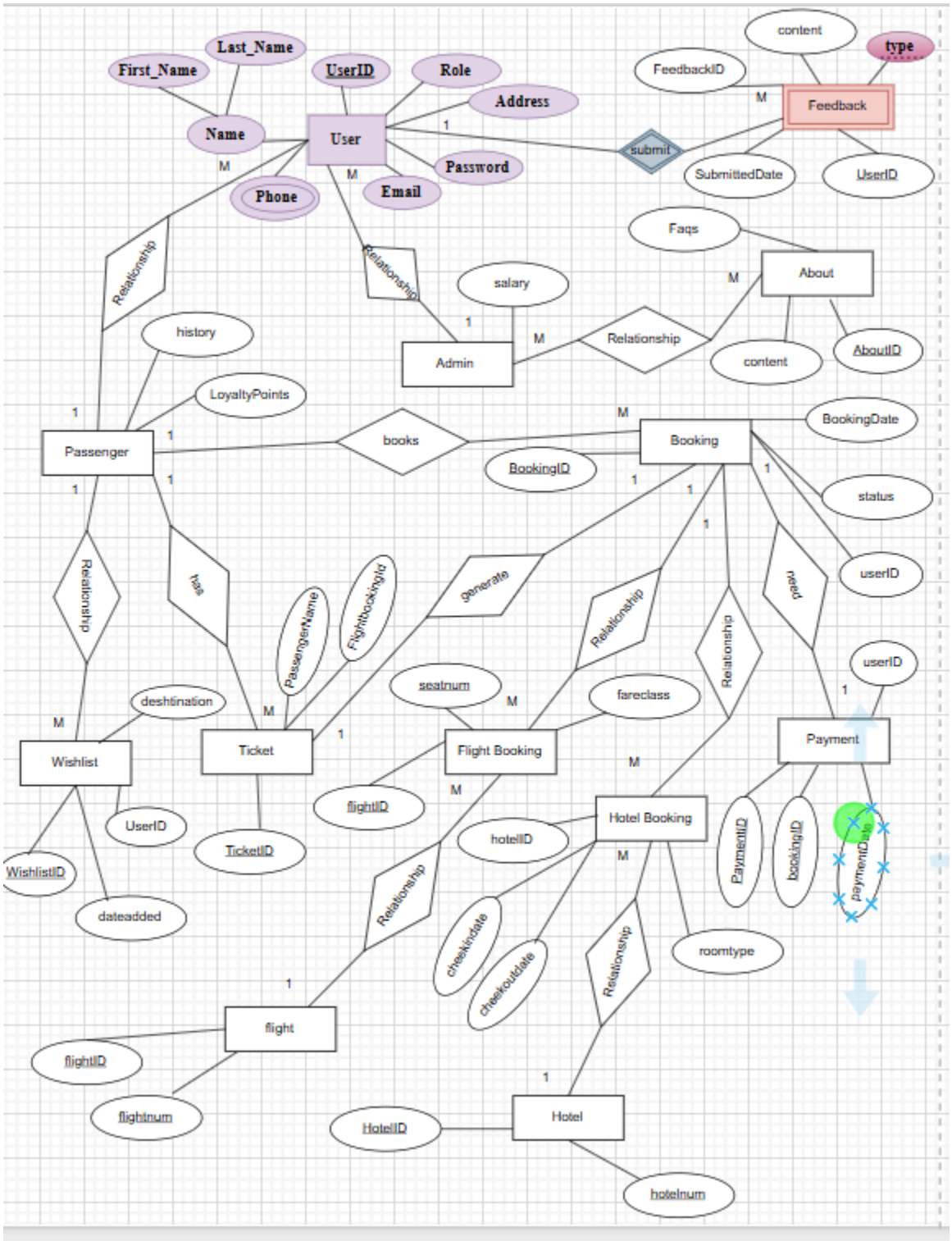
10. Analytical Dashboard Component



- **Class Diagram**



- Database Design



4. User Interface Design (Figma prototype or actual product)

- **UI Wireframes/Mockups**

Link of Figma:

https://www.figma.com/design/amRKxtyWTdNuuOfuk4PBHN/Untitled?node-id=0-1&p=f&t=p8DfatxIAq3DTjjF-0