Department of Computer Science and Engineering
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CSE306: Software Engineering & Information System Design Laboratory

Software Design Document

Odyssey Travel Agency Software

Submitted by

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Remarks

Abstract

The Odyssey Travel website revolutionizes the way individuals plan and experience their journeys, providing a comprehensive platform that caters to all travel needs. Embracing the essence of convenience and personalization, Odyssey Travel offers a diverse range of travel packages, allowing users to effortlessly explore destinations and select their preferred accommodations and transportation options. The platform's intuitive interface ensures seamless navigation, empowering users to customize their travel plans to match their unique preferences. By bridging the gap between travelers and local service providers, Odyssey Travel promotes cultural exchange and supports local economies. The website not only simplifies the travel booking process but also enhances the overall travel experience by offering tailored recommendations and insights. With a commitment to customer satisfaction and innovation, Odyssey Travel is the ultimate companion for anyone looking to embark on unforgettable adventures.

Contents

Index of Diagrams

1 Introduction

In the modern era of digital transformation, travel planning has become increasingly sophisticated, demanding seamless and user-friendly online solutions. This project aims to develop a robust web-based platform for a travel agency, providing an integrated solution for browsing and booking travel packages, transportation, and accommodations. Leveraging cutting-edge technologies like Next.js for efficient front-end rendering, Node.js for scalable server-side operations, SQL for reliable data management, and Tailwind CSS for responsive design, the platform offers a streamlined experience for both visitors and logged-in users. By focusing on ease of use, performance, and security, this project addresses the needs of contemporary travelers, enhancing their journey from planning to booking.

1.1 Flow Chart

The flowchart provides a detailed outline of the steps a user follows on the Odyssey Travel website, from initial interaction to the successful booking of a travel package. It covers user login, registration, browsing of travel packages, booking processes, and the final checkout stage.

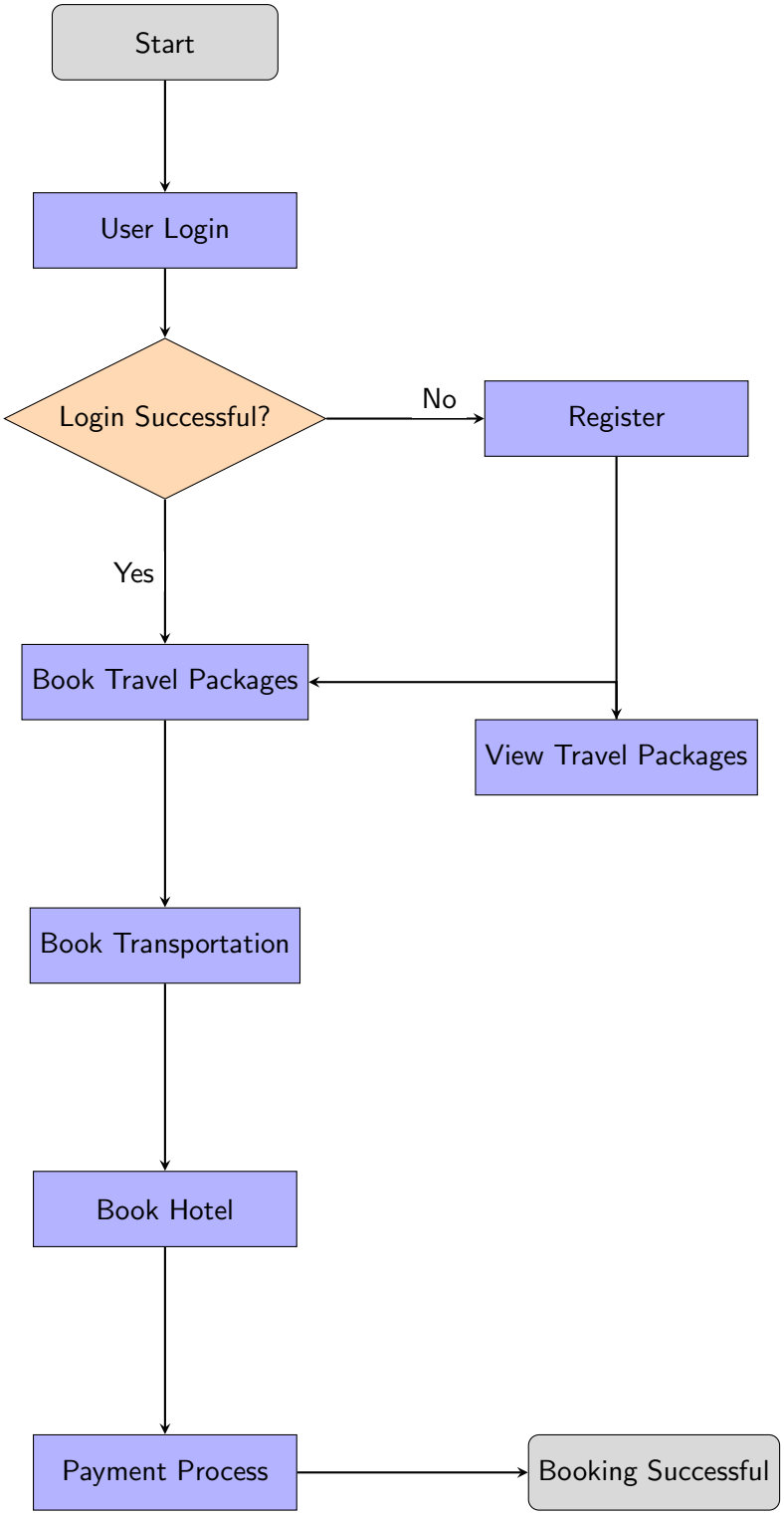

Fig 1.1: Flow Chart for Travel Agency Software

1.1.1 User Interaction Flow :

- **Start:** Represents the initial state when a user begins their interaction with the Odyssey Travel website.
- **User Login:** The user is prompted to log in to the system by entering their credentials.
- **Login Successful?:** A decision point to verify if the user's login credentials are valid.

  - **Yes:** User is authenticated and proceeds to view travel packages.
  - **No:** User is redirected to the registration process.

- **Register:** For users who are not already registered.
  - **Action:** User completes the registration form with necessary details and submits it.

- **View Travel Packages:** Once logged in or registered, the user can browse the available travel packages.
  - **Action:** User explores various travel packages offered by Odyssey Travel.

- **View Package Details:** The user selects a travel package to see more detailed information.
  - **Action:** User reviews details such as itinerary, price, inclusions, and exclusions.

- **Book Package:** The user decides to book the selected travel package.
  - **Action:** User initiates the booking process for the chosen package.

- **Book Transportation:** The user selects and books transportation options related to their travel package.
  - **Action:** User chooses their preferred mode of transportation and confirms the booking.

- **Book Hotel:** The user selects and books accommodations as part of the travel package.
  - **Action:** User reviews and selects hotels or lodgings and confirms the booking.

- **Add Payment Details:** The user provides payment information to finalize the booking.
  - **Action:** User enters payment details such as credit card information or other payment methods.

- **Checkout:** Final review and confirmation of all booking details before completing the transaction.
  - **Action:** User reviews the total cost, verifies all details, and confirms the booking.

- **Booking Successful:** Confirmation that the booking has been successfully completed.
  - **Action:** User receives a confirmation email with booking details and further instructions if needed.

2 System Architecture

The system architecture of the Odyssey Travel website is designed to provide a robust and scalable platform for managing travel bookings and related services. It comprises several key components:

2.1 System Architecture Diagram

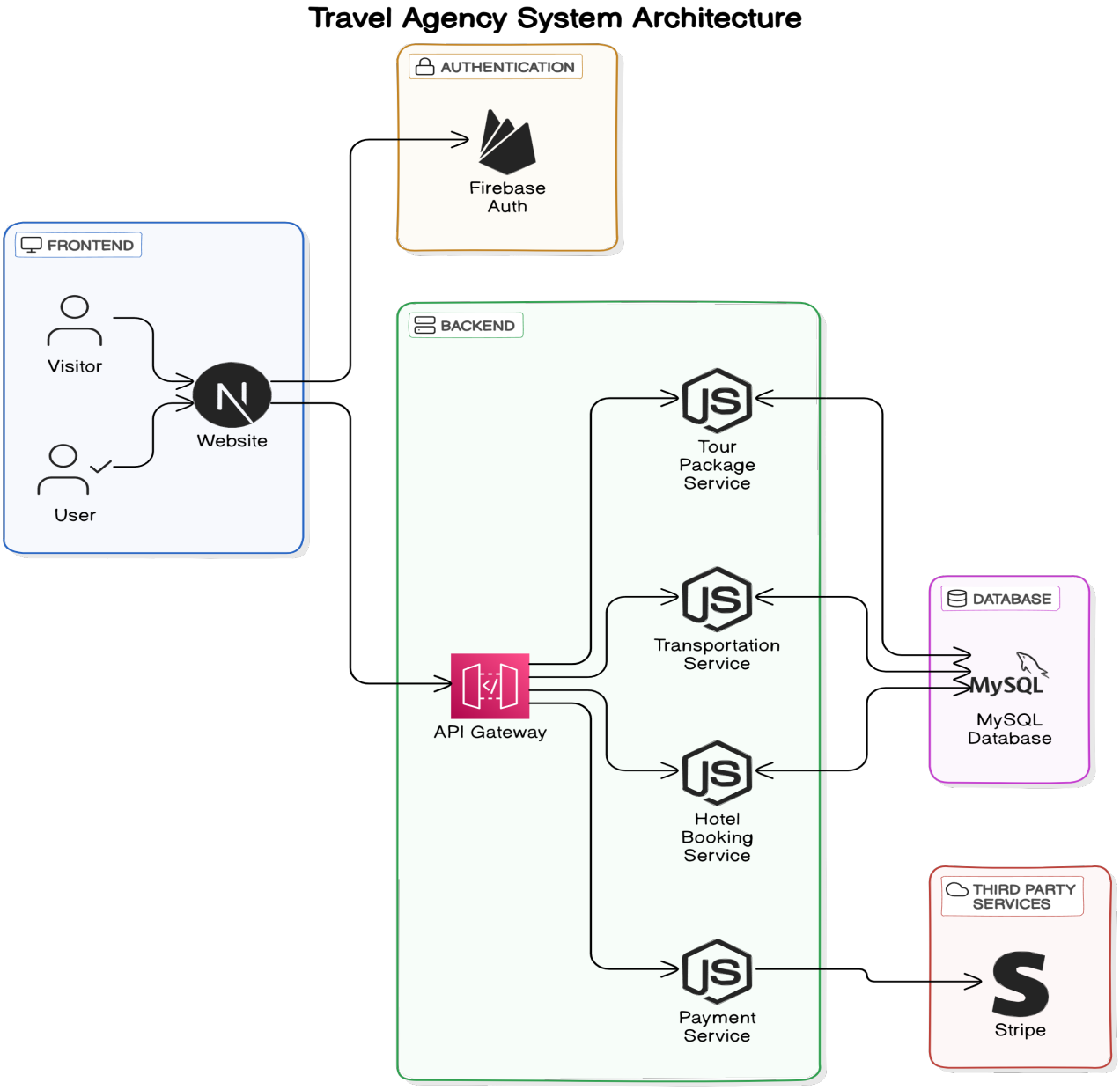

Figure - 2.1 : System Architecture Diagram For Travel Agency Software

2.2 System Interaction

Table 2.1: Front-End

Technology	Next.js
Description	Responsible for rendering the user interface (UI) components of the website.
Features	• Implements client-side routing • Supports SSR (Server-Side Rendering) • Enables efficient UI updates

Table 2.2: Back-End

Technology	Node.js
Description	Handles server-side logic, API integrations, and database interactions.
Features	• Uses Express.js for routing • Integrates with SQL database for data storage and retrieval

Table 2.3: Database

Technology	SQL (Structured Query Language)
Description	Stores all relevant data including user information, travel packages, bookings, and transaction details.
Features	• Ensures data integrity • Supports scalability • Allows complex queries for data manipulation

Table 2.4: Authentication and Authorization

Technology	Authentication users with Firebase
Description	Manages user authentication and authorization processes securely.
Features	• Implements JWT (JSON Web Tokens) for session management • Ensures secure access to user-specific data and operations

Table 2.5: User Interface

Technology	Tailwind CSS
Description	Provides a responsive and visually appealing design for the website.
Features	• Utilizes utility-first CSS framework • Enhances user experience across devices

Table 2.6: Integration Services

Description	Facilitates integration with external services such as payment gateways and third-party APIs for real-time data updates and service enhancements.
Features	• Implements RESTful APIs for seamless communication

Table 2.7: System Interaction

User Interaction	Users access the website through a web browser. They interact with the front-end components developed in Next.js, which fetch data from the back-end server via RESTful API endpoints.
Data Management	The Node.js server handles incoming requests, processes business logic, and interacts with the SQL database to store and retrieve data related to travel packages, bookings, and user profiles.
Authentication Flow	Upon login, the authentication middleware verifies user credentials and issues JWT tokens for subsequent authenticated requests. Unauthorized users are redirected to the registration process.
Booking Process	Users navigate through travel packages, select options such as transportation and accommodations, and proceed to book these services. The booking details are stored in the SQL database and confirmed through integration services.

2.3 Scalability and Reliability

Table 2.8: Scalability and Reliability

Scalability	Components such as Node.js and SQL database are chosen for their ability to handle increasing loads and data volumes. Horizontal scaling can be achieved by deploying multiple instances of the application and load balancing incoming traffic.
Reliability	The use of robust technologies and best practices in authentication, data management, and API integration ensures reliable performance and minimal downtime for users.

3 UML

3.1 Activity Diagram

Activity Diagram for Travel Agency Software

The activity diagram illustrates user activities and workflows in the Travel Agency Software, highlighting how users interact with various features.

- **User Initiation:**
  - Users start the process as visitors, registered users, or admins.
- **Browsing Packages:**
  - Users browse travel packages, viewing details like destination, itinerary, and price.
- **Registration/Login:**
  - Users register or log in to access booking and management features.
- **Package Selection and Booking:**
  - Registered users select and book travel packages, including dates and options.
- **Applying Coupons:**
  - Users apply discount coupons to adjust the package price.
- **Booking Flights and Transportation:**
  - Users book flights and transportation linked to their package.
- **Booking Hotels:**
  - Users book hotels for their stay based on package details.
- **Admin Management:**
  - Admins manage plans, hotels, and tour guides.
- **End Process:**
  - Users complete booking or other activities, concluding the process.

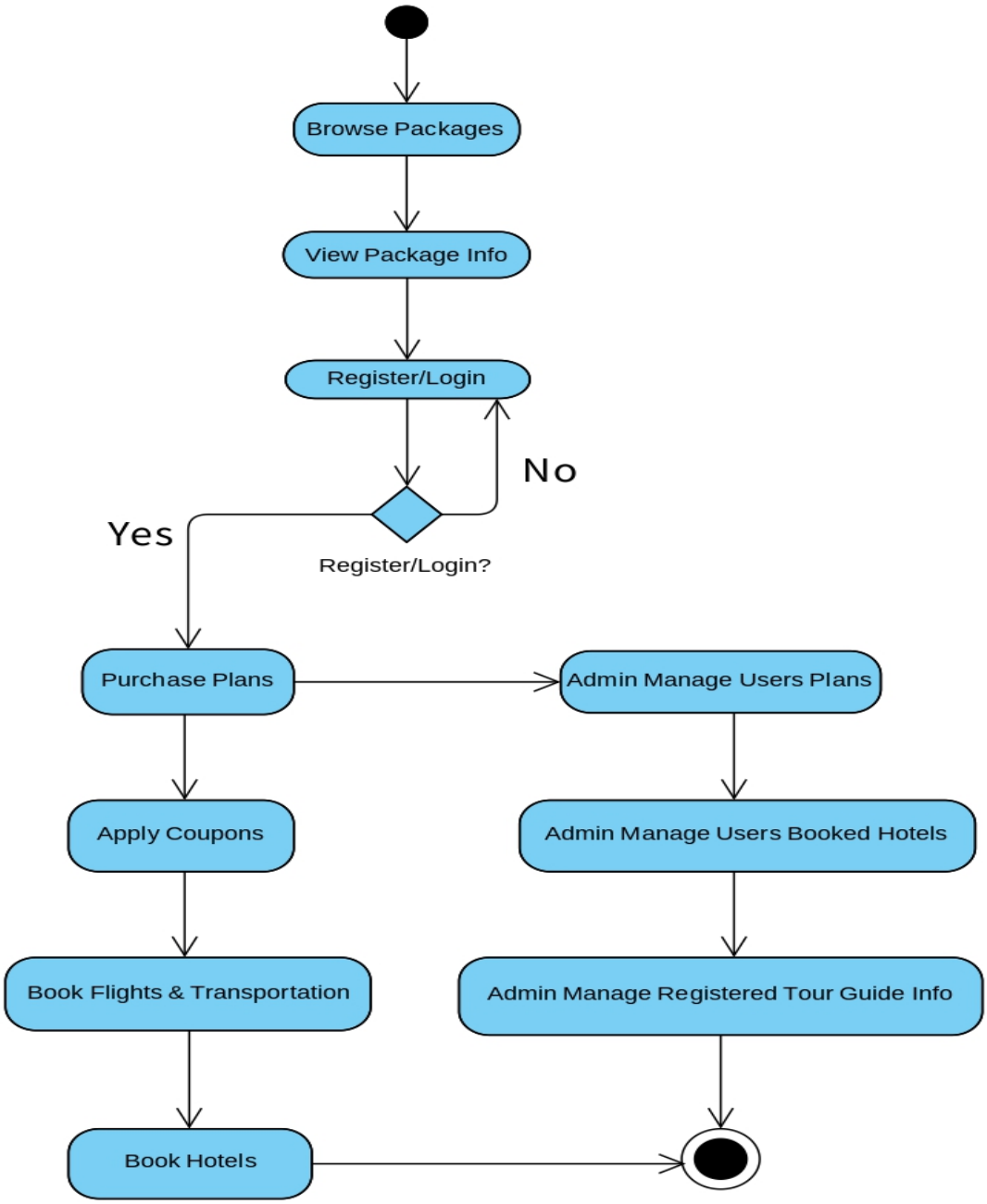

Figure - 3.1 : Activity Diagram For Travel Agency Software

Use Case Diagram :

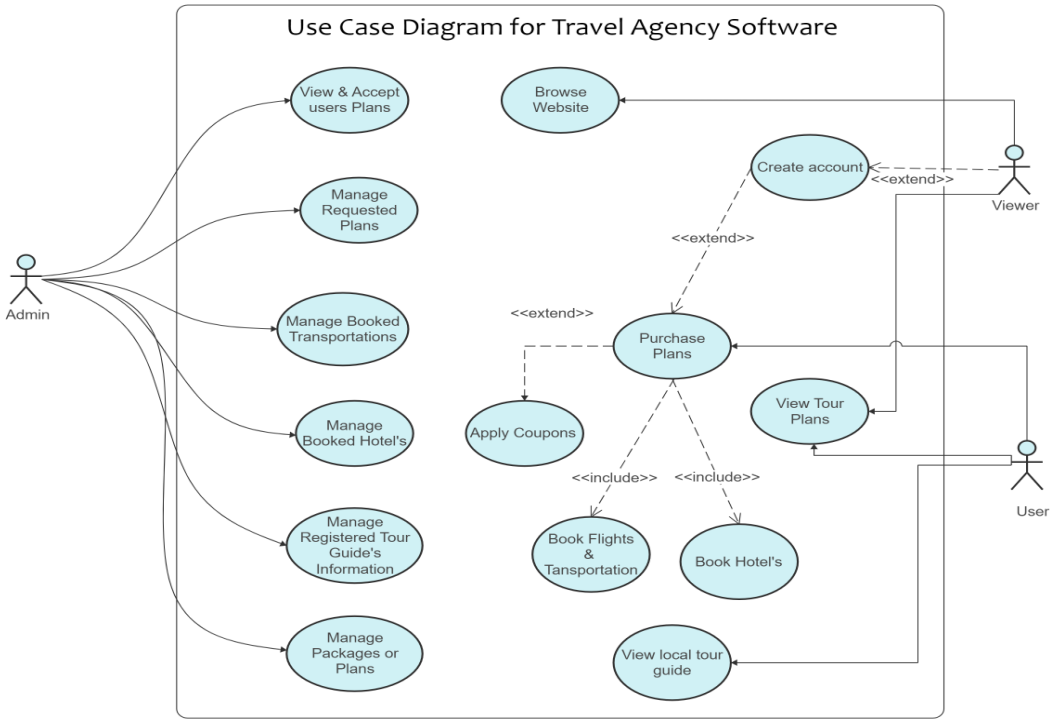

Figure - 3.3.1 : Use Case Diagram For Travel Agency Software

3.2 Sequence Diagram :

The sequence diagram illustrates the interaction flow between a user and a travel booking system. It begins with the user browsing available travel packages. Upon selection of a package, the system prompts the user to either log in or register if not authenticated. The user provides their credentials or completes the registration process.

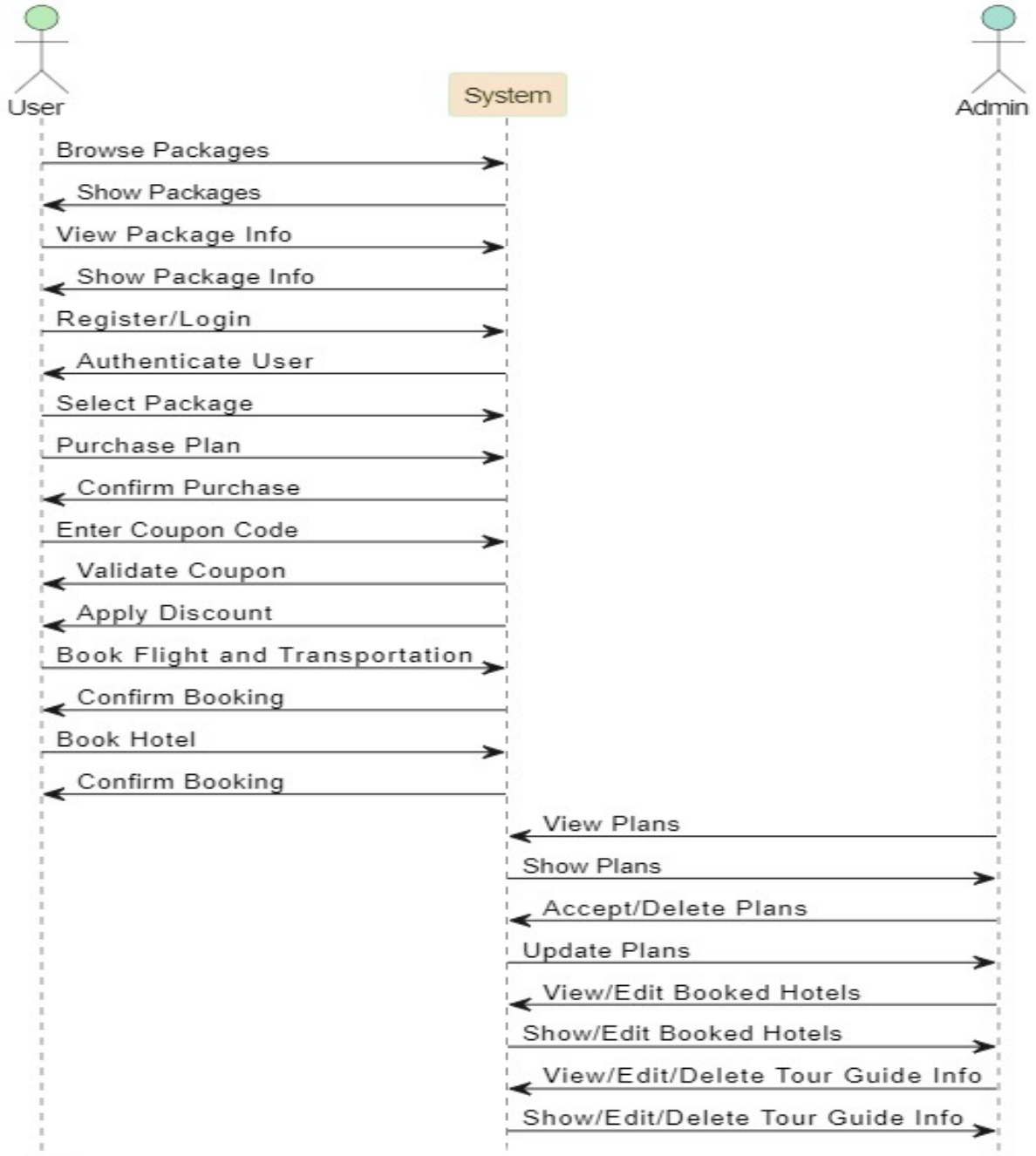

Figure - 3.4.1 : Sequence Diagram For Travel Agency Software

3.1.1. SD 1: Users Viewing Packages

Diagram:

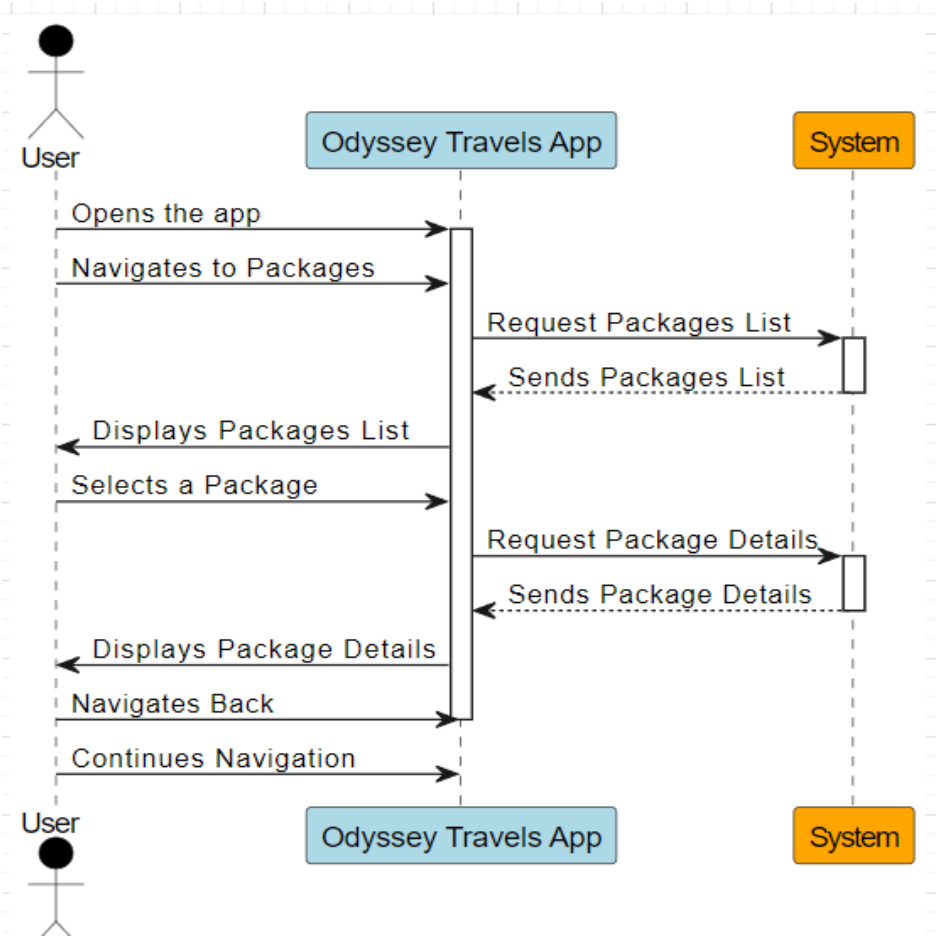

Figure-3.1: Sequence Diagram 01

Brief Description: Users view available travel packages on the Odyssey Travels platform.

3.1.2. SD 2: Purchase Plan

Diagram:

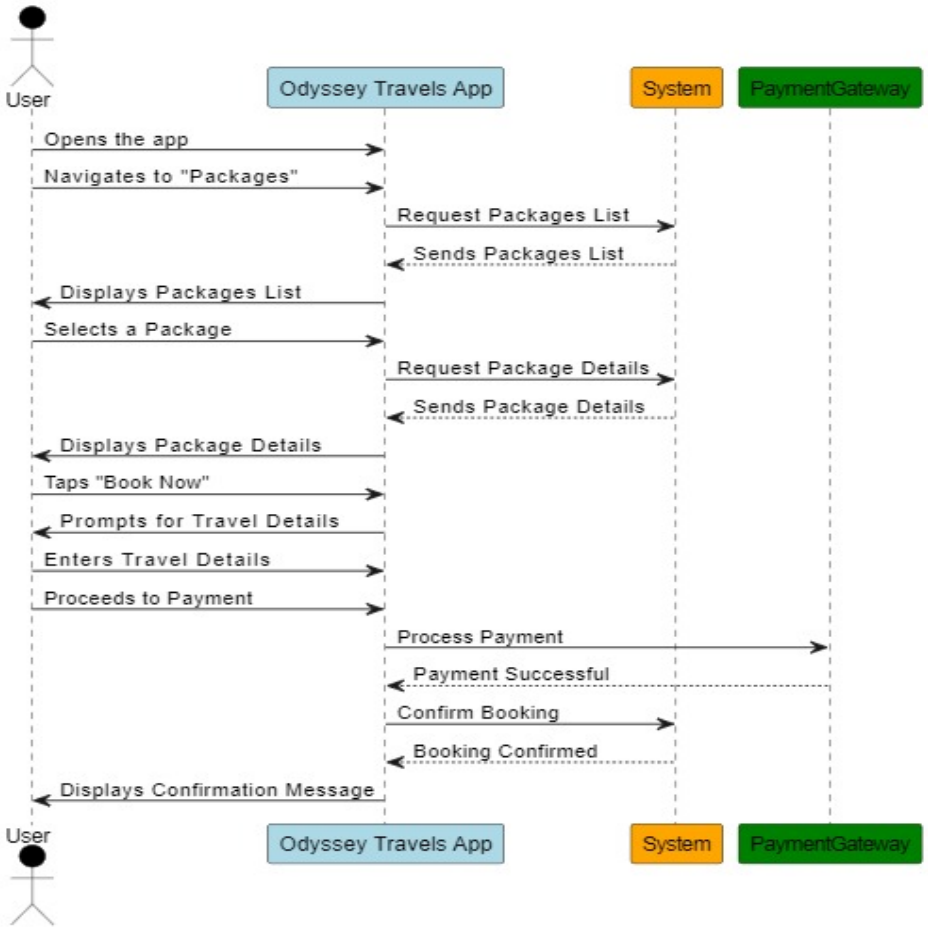

Figure-3.2: Sequence Diagram 02

Brief Description: User selects and purchases a travel plan on the Odyssey Travels platform.

Preconditions:

- User has a working internet connection.
- Odyssey Travels application is installed on the device.
- User is logged into the Odyssey Travels account.

3.1.3. SD 3: Purchase Plan with Apply Coupon

Diagram:

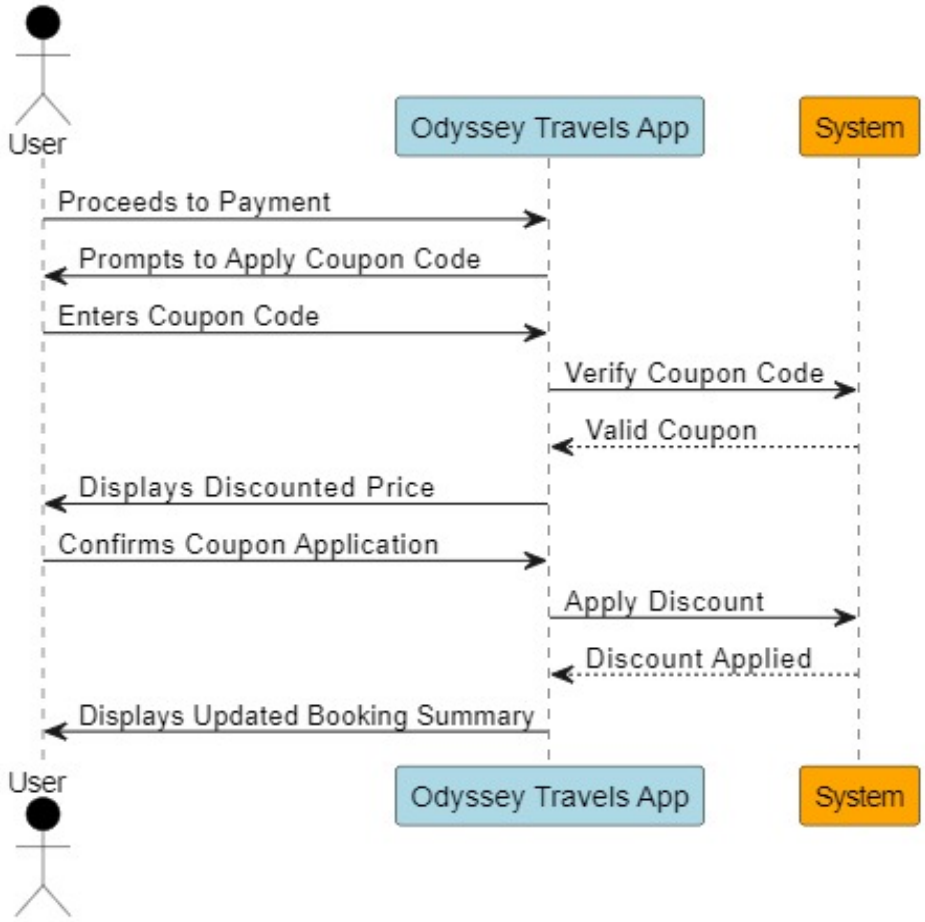

Figure-3.3: Sequence Diagram 03

Brief Description: User applies a coupon code during the booking process to avail discounts or special offers.

3.1.4. SD 4: Book Flight and Transportation

Diagram:

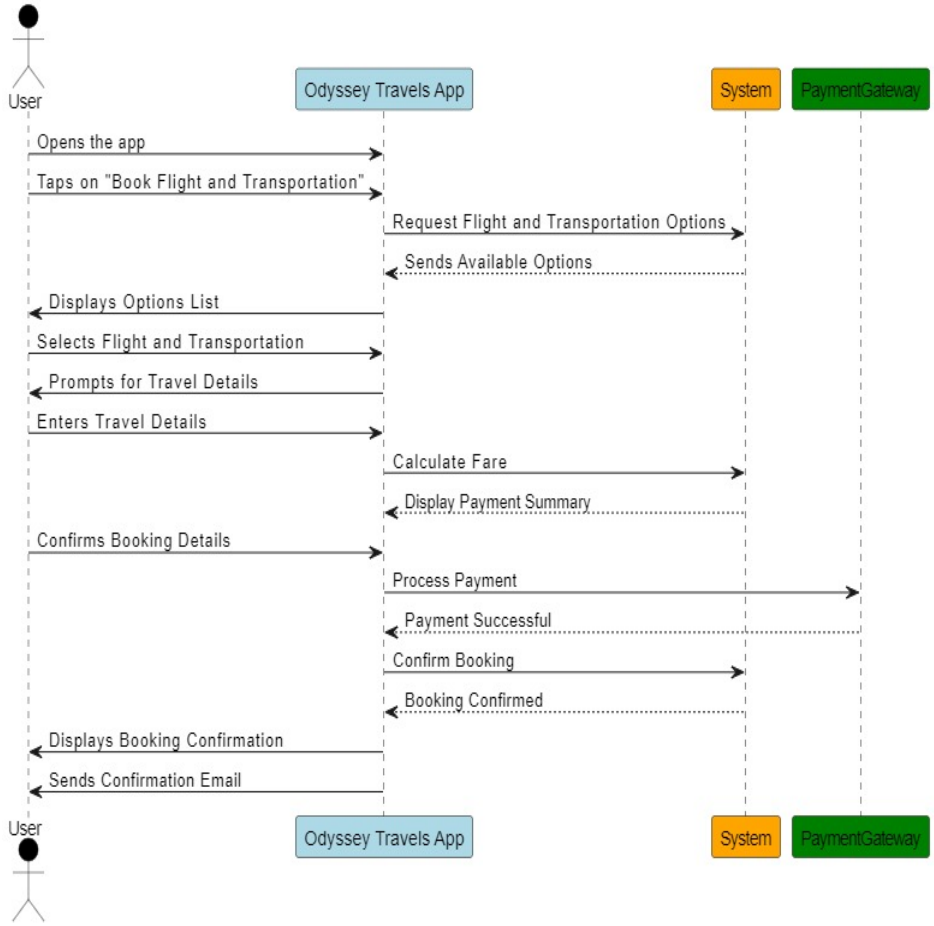

Figure-3.4: Sequence Diagram 04

Brief Description: User selects and books flights and transportation services through the Odyssey Travels application.

3.1.5. SD 5: Booking Hotel

Diagram:

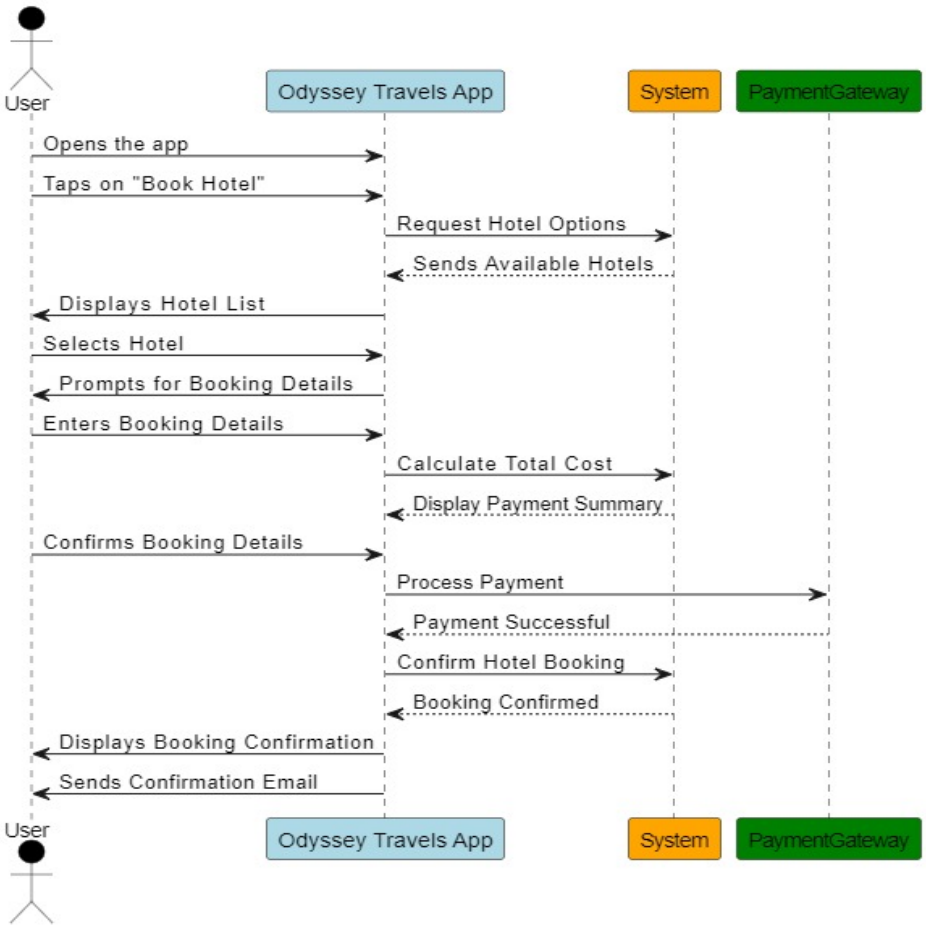

Figure-3.5: Sequence Diagram 05

Brief Description: User searches for available hotels, selects a room, books the hotel, and completes the transaction through a payment process.

3.1.6. SD 6: Admin View and Accept/Delete Plans

Diagram:

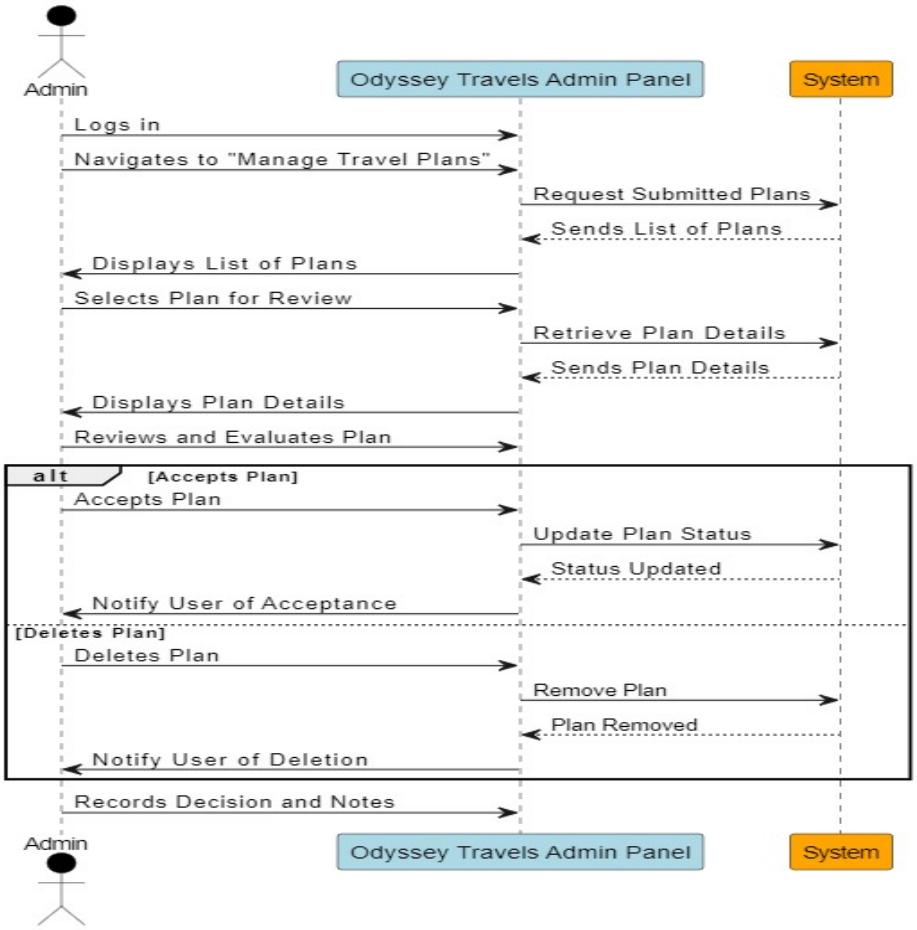

Figure-3.6: Sequence Diagram 06

Brief Description: Admin reviews and manages travel plans submitted by users, either accepting or deleting them based on predefined criteria.

3.1.7. SD 7: Admin View and Edit Booked Hotels of Users

Diagram:

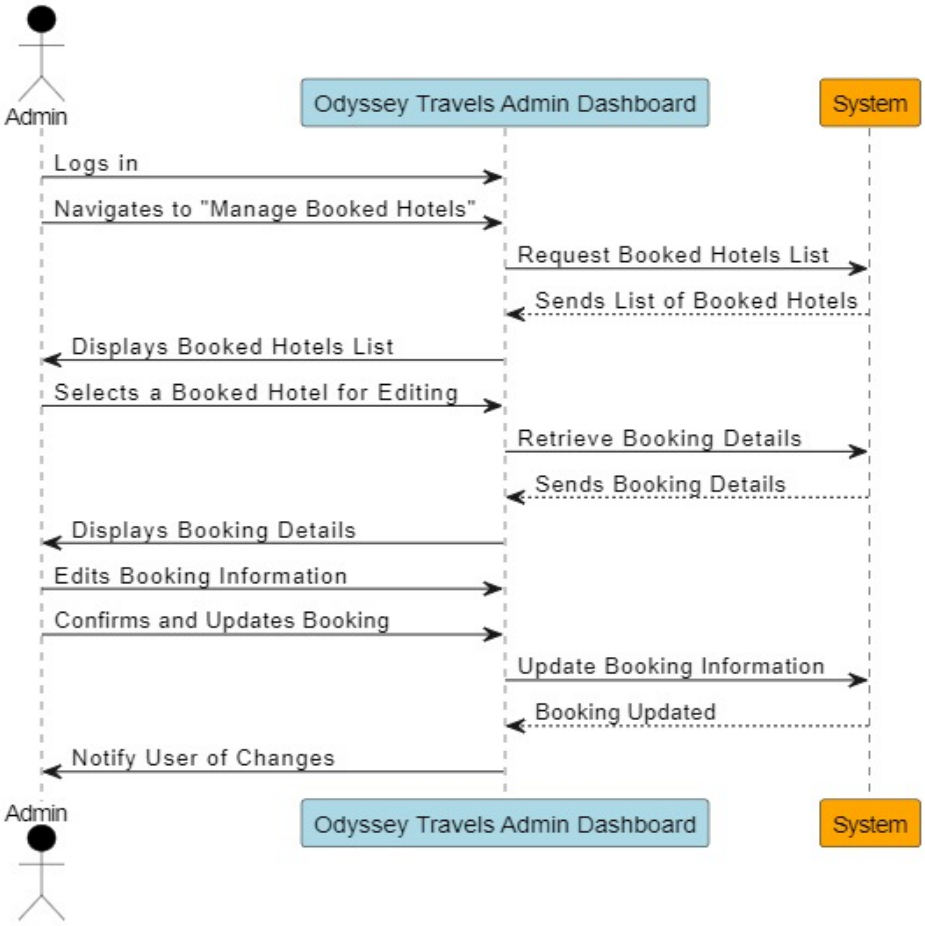

Figure-3.7: Sequence Diagram 07

Brief Description: Admin accesses and modifies hotel bookings made by users through the Odyssey Travels platform.

3.1.8. SD 8: Admin View, Edit, Delete Registered Tour Guide's Information

Diagram:

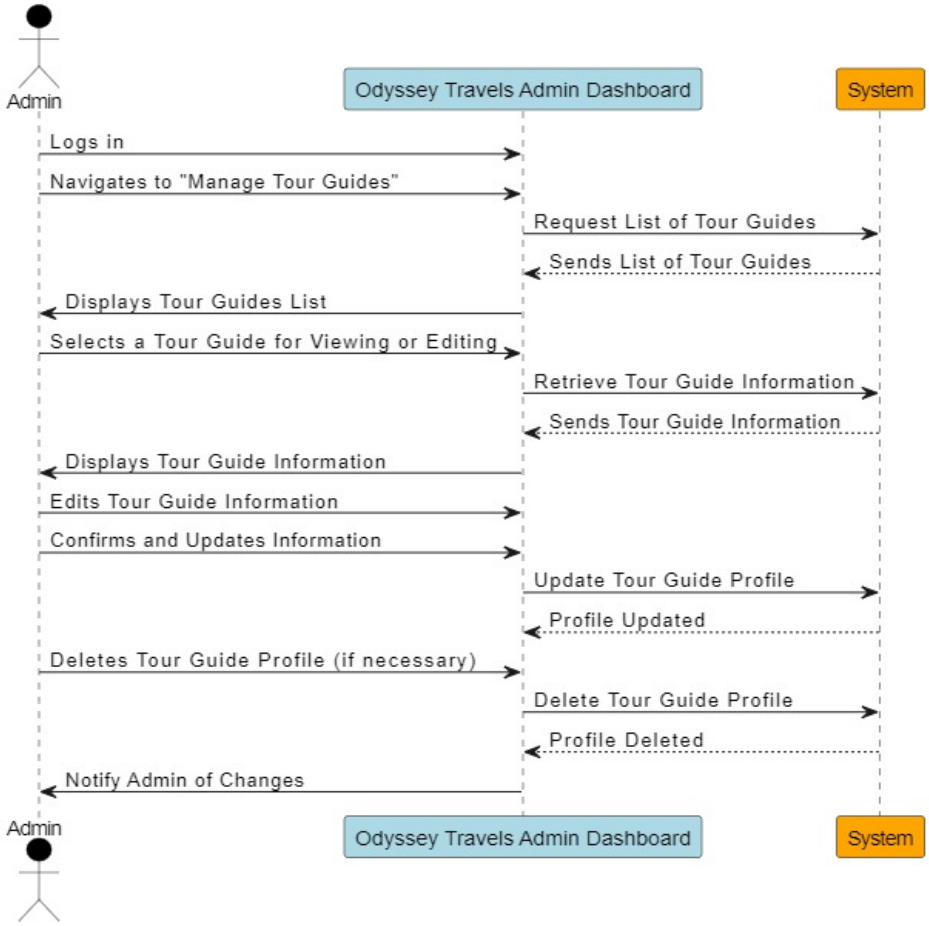

Figure-3.8: Sequence Diagram 08

Brief Description: Admin manages the information of registered tour guides within the Odyssey Travels platform.

3.3 Data Flow Diagram

DFD (Data Flow Diagram) helps us understand the how the data is flowing across the system and what is the relation between the functions of the system. Level 0 DFD and Level 1 DFD of Efficiency Monitor are shown in figure-9.1 and figure-9.2 respectively.

3.4 Level-0 Data Flow Diagram

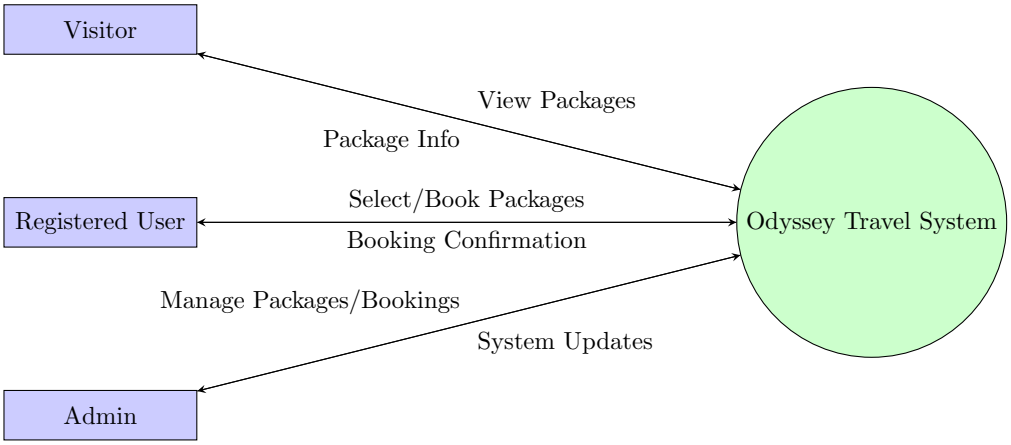

Figure-3.6: Level 0 DFD of Travel Agency Software

3.5 Level-1 Data Flow Diagram

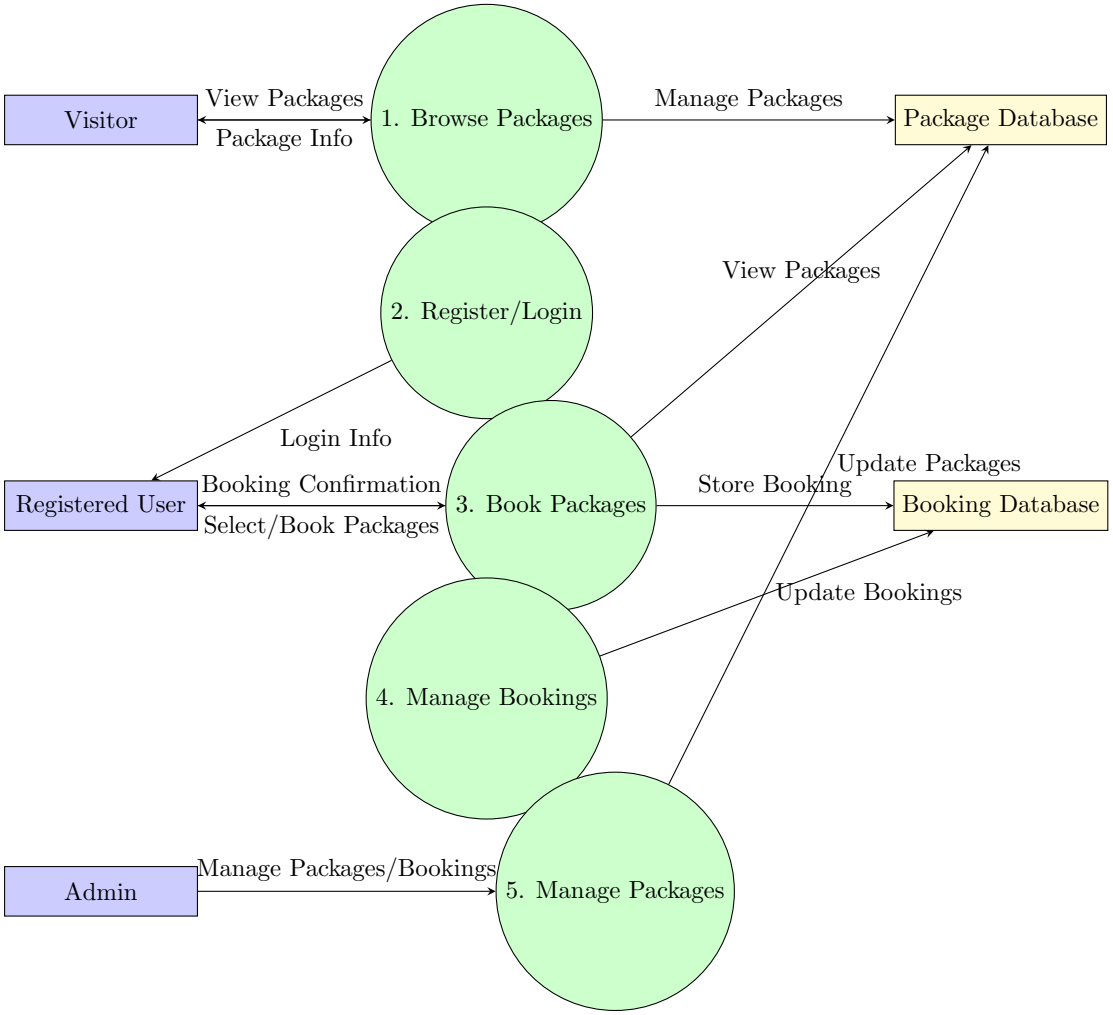

Figure-3.7: Level 1 DFD of Travel Agency Software

3.6 Entity Relationship(ER) Diagram

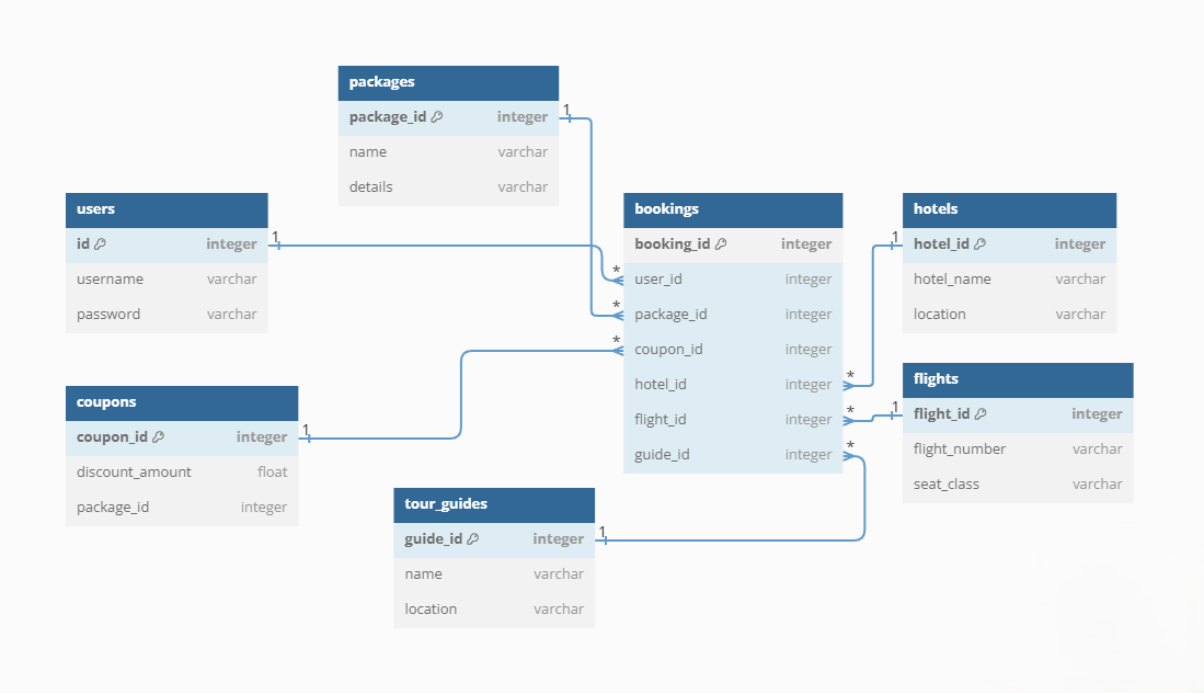

Figure - 3.8 : Entity Relationship(ER) Diagram For Travel Agency Software

The Entity-Relationship Diagram (ERD) illustrates the key components and their relationships in a travel booking system. The diagram includes the following entities:

- **users**: Contains user information such as `id`, `username`, and `password`.
- **packages**: Stores details of travel packages including `package_id`, `name`, and `details`.
- **bookings**: Records booking information, linking `user_id` to **users**, `package_id` to **packages**, and optionally `coupon_id`, `hotel_id`, `flight_id`, and `guide_id` to other entities for additional services.
- **hotels**: Contains hotel details including `hotel_id`, `hotel_name`, and `location`.
- **coupons**: Represents discount coupons, with `coupon_id`, `discount_amount`, and a reference `package_id` to the applicable package.
- **tour_guides**: Includes details about tour guides such as `guide_id`, `name`, and `location`.
- **flights**: Captures flight information including `flight_id`, `flight_number`, and `seat_class`.

The relationships among these entities are as follows:

- **bookings** links to **users** via `user_id`.
- **bookings** links to **packages** via `package_id`.
- **bookings** links to **hotels** via `hotel_id`.
- **bookings** links to **coupons** via `coupon_id`.
- **bookings** links to **flights** via `flight_id`.
- **bookings** links to **tour_guides** via `guide_id`.

4 Conclusion

In Conclusion, the design of the Travel Agency Software presents a robust framework aimed at enhancing user experience and operational efficiency. By leveraging modern technologies such as Next.js for frontend development, Node.js for backend logic, and SQL databases for data management, the system ensures scalability and reliability. The integration of Tailwind CSS enhances the user interface, offering a responsive and visually appealing design. Authentication mechanisms using custom middleware and JWT tokens provide secure access control. The system's modular architecture facilitates easy maintenance and future enhancements, ensuring adaptability to evolving business needs. Overall, the Travel Agency Software is poised to streamline booking processes, optimize resource utilization, and deliver a seamless travel booking experience for users.