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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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.

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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.

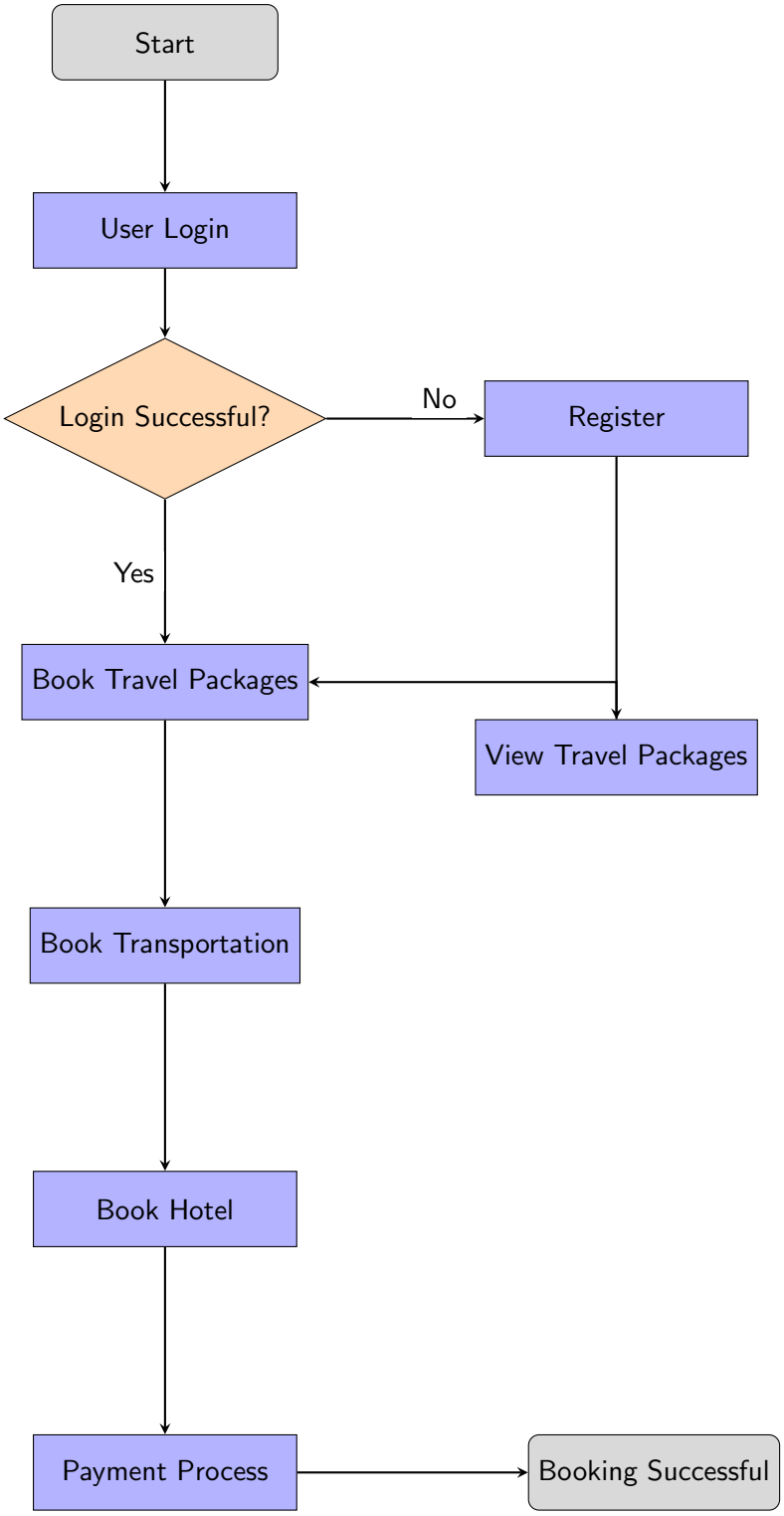

Fig 1.1: Flow Chart for Travel Agency Software

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

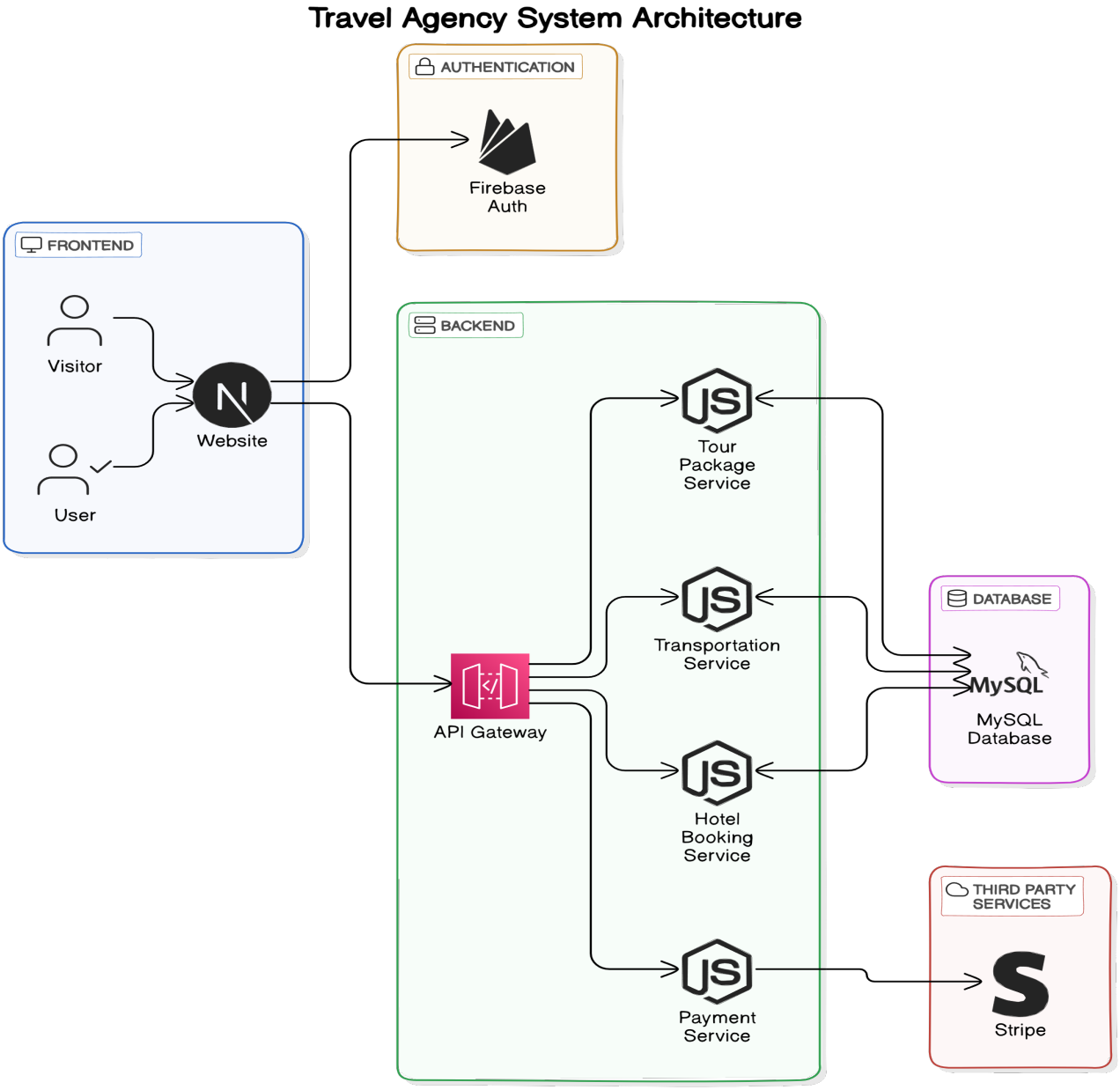

Figure - 2.1 : System Architecture Diagram For Travel Agency Software

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.

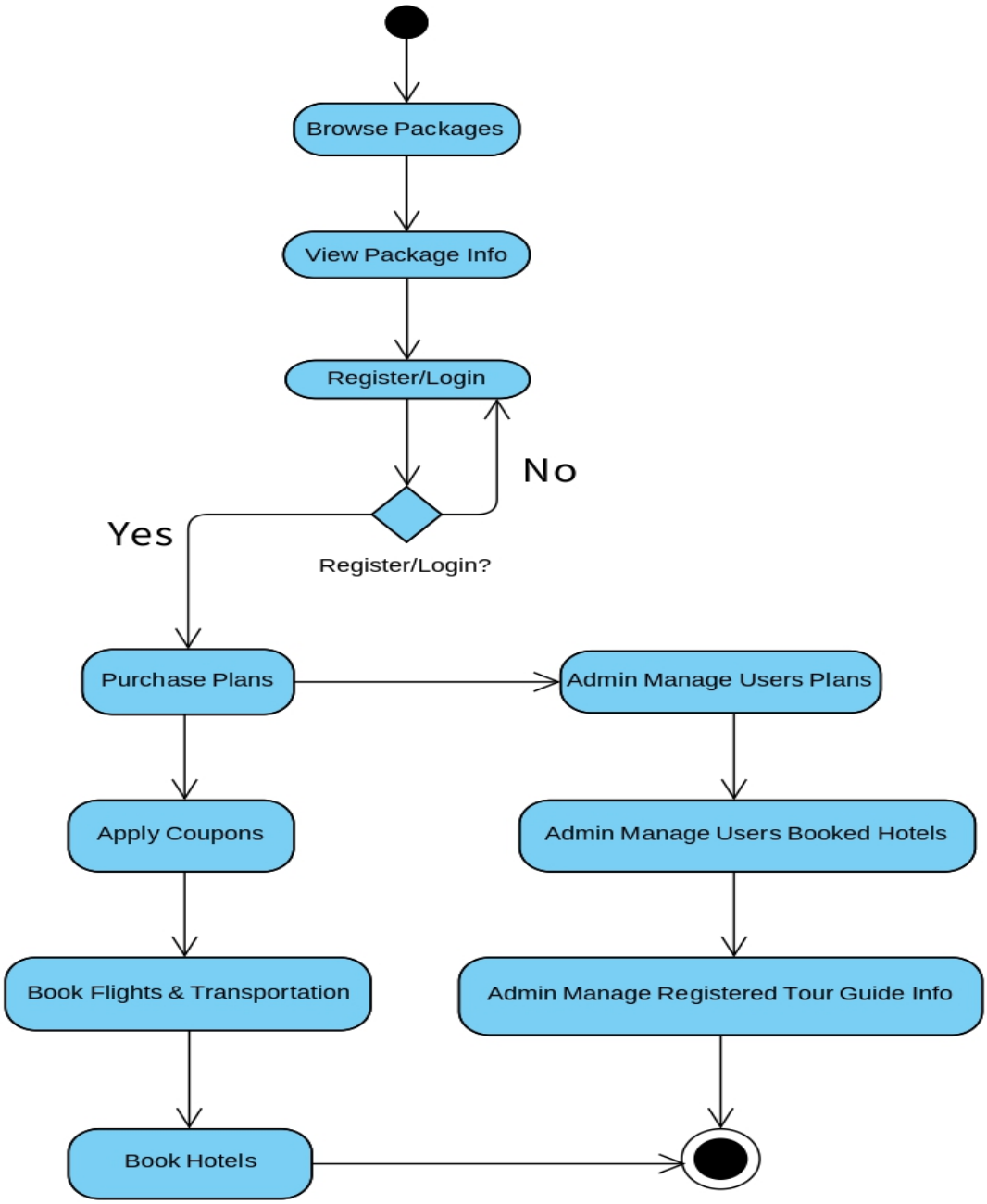

Figure - 3.1 : Activity Diagram For Travel Agency Software

3.2 Use Cases

Use Cases help us to identify the actors involved in an interaction and names the type of interaction. This subsection outlines the Use Cases for our system's users. Use cases are determined following the scenarios mentioned in section-6.

3.1.1. UC 1: Users Viewing Packages

Diagram:

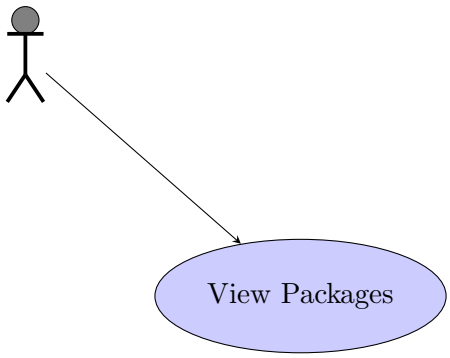

Figure-3.1: Use Case 01

Brief Description: Users view available travel packages on the Odyssey Travels platform. **Pre-conditions:**

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

Main Success Scenario:

1. User opens the Odyssey Travels application.
2. System displays the home screen with navigation options: Home, About, Packages, Login, Signup, Contact Us.
3. User taps on the "Packages" option from the navigation menu.
4. System shows the "Packages" page, listing various travel packages available.
5. User scrolls through the list of packages to explore details and options.
6. System displays package details including destination, duration, pricing, and amenities.
7. User selects a specific package for more detailed information.
8. System shows detailed information such as itinerary, inclusions, and exclusions.
9. User navigates back to the package list or other sections using navigation buttons.

Postcondition:

- System displays the selected package details accurately.
- User can proceed to book the selected package or explore other options.

3.1.2. UC 2: Purchase Plan

Diagram:

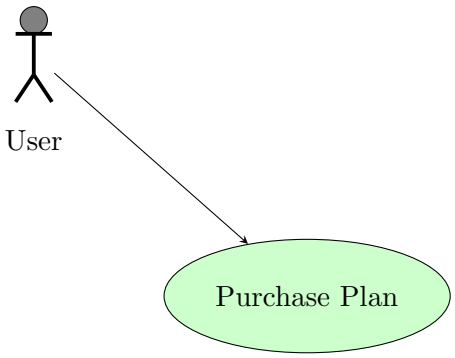

Figure-3.2: Use Case 02

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.

Main Success Scenario:

1. System displays the home page of the Odyssey Travels application.
2. User navigates to the "Packages" section from the navigation menu.
3. System shows a list of available travel packages.
4. User selects a specific travel package for purchase.
5. System displays detailed information about the selected package, including itinerary, pricing, and booking options.
6. User confirms the package selection and taps on the "Book Now" button.
7. System prompts the user to enter necessary details such as travel dates, number of travelers, and any additional preferences.
8. User fills in the required information and proceeds to the payment section.
9. System securely processes the payment using the chosen payment method (e.g., credit card, PayPal).
10. System confirms the successful booking and displays a confirmation message with booking details.
11. User receives a confirmation email with the booking details.

Postconditions:

- User's selected travel plan is successfully booked and confirmed.
- System displays the home page or booking summary for the user to review.

Alternative Courses:

5a. User explores additional details or options before making a final selection.

7a. User adjusts travel details or preferences before confirming the booking.

9a. Payment transaction fails or encounters issues; system prompts user to retry or choose an alternative payment method.

Exceptions:

- User may abandon the booking process at any step before final confirmation.

3.1.3. UC 3: Purchase Plan with Apply Coupon

Diagram:

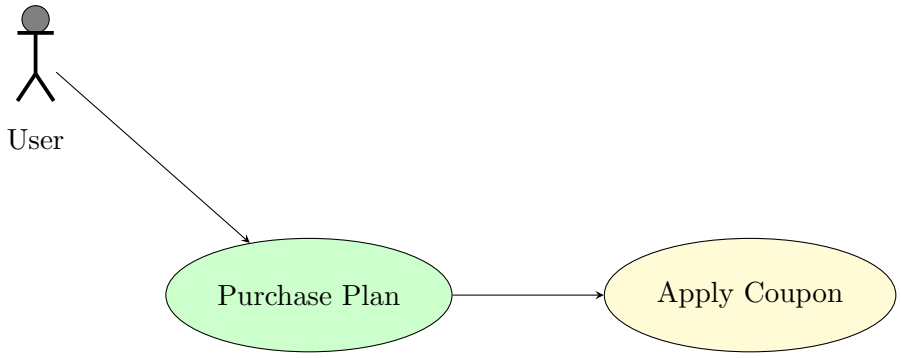

Figure-3.3: Use Case 03

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

UC 3: Apply Coupon

Preconditions:

- User has a working internet connection.
- Odyssey Travels application is installed on the device.
- User is logged into the Odyssey Travels account.
- User has selected a travel package and proceeded to the payment section.

Main Success Scenario:

1. System displays the booking details and prompts the user to apply a coupon code.
2. User enters the coupon code in the designated field.
3. System verifies the coupon validity and applies the discount to the total booking amount.
4. System updates the payment summary to reflect the discounted price.
5. User confirms the application of the coupon code.
6. System confirms the coupon code application and adjusts the total payable amount accordingly.

Postconditions:

- System displays the updated booking summary with the discounted price.
- User proceeds to complete the booking with the discounted price.

Alternative Courses:

3a. User enters an invalid coupon code or expired coupon.

3a.01. System displays an error message indicating the issue with the coupon code.

3a.02. User can retry with a different coupon code or proceed without applying any coupon.

Exceptions:

- User may abandon the coupon application process at any step before confirmation.

3.1.4. UC 4: Book Flight and Transportation

Diagram:

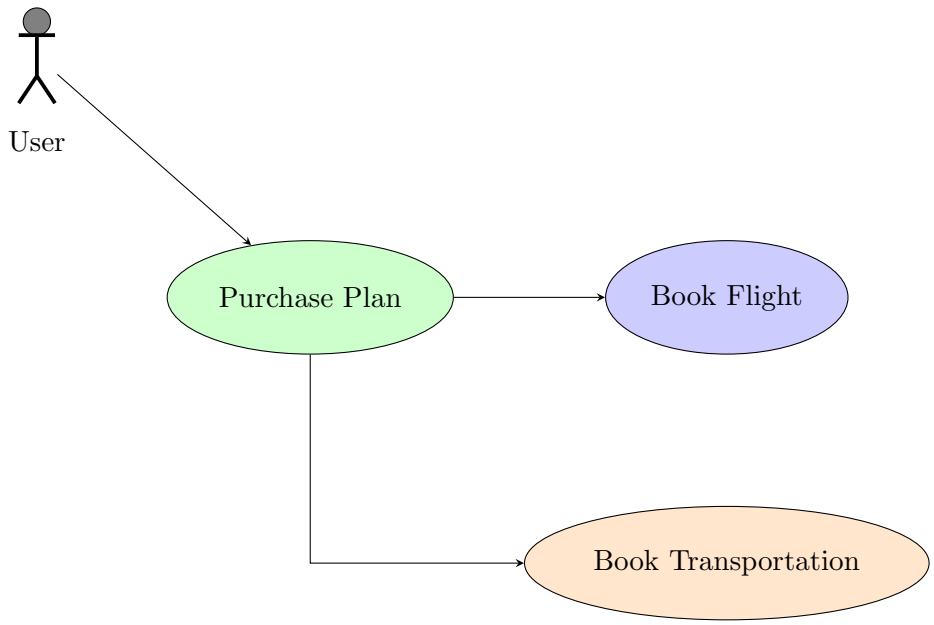

Figure-3.4: Use Case 04

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

UC 4: Book Flight and Transportation

Preconditions:

- User has a working internet connection.
- Odyssey Travels application is installed on the device.
- User is logged into the Odyssey Travels account.
- User has navigated to the booking section of the app.

Main Success Scenario:

1. System displays the home page of the Odyssey Travels App.
2. User taps on the 'Book Flight and Transportation' option from the display screen.
3. System displays a list of available flights and transportation options.
4. User selects a flight and transportation option.
5. System prompts user to enter travel details such as departure date, return date, number of passengers, etc.
6. User fills in the required details.
7. System calculates the total fare and displays the payment summary.
8. User confirms the booking details.
9. System processes the payment transaction securely.
10. System confirms the booking with a booking ID and sends a confirmation email or notification to the user.
11. User receives the booking confirmation and can view the booking details in the app.

Postconditions:

- System updates the user's booking history with the new booking details.
- User can access the booked flight and transportation details under their account.

Alternative Courses:

5a. User searches for a specific flight or transportation option not listed.

5a.01. System displays a message indicating no results found.

5a.02. User can retry with different search criteria or contact support.

Exceptions:

- User may abandon the booking process at any step before confirming the payment.

3.1.5. UC 5: Book Hotel

Diagram:

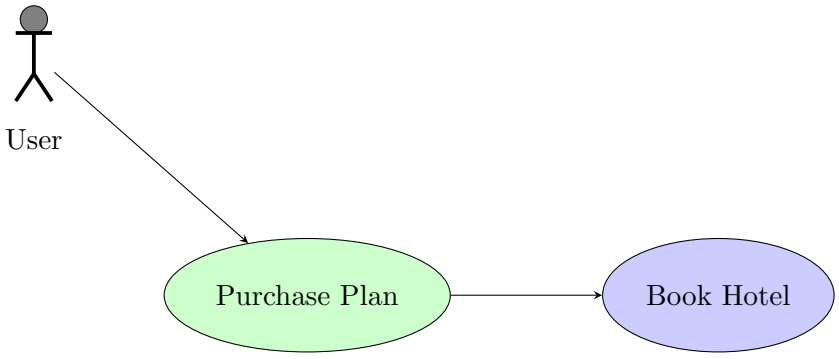

Figure-3.5: Use Case 05

Brief Description: User selects and books accommodations through the Odyssey Travels application.

UC 5: Book Hotel

Preconditions:

- User has a working internet connection.
- Odyssey Travels application is installed on the device.
- User is logged into the Odyssey Travels account.
- User has navigated to the hotel booking section of the app.

Main Success Scenario:

1. System displays the home page of the Odyssey Travels App.
2. User taps on the 'Book Hotel' option from the display screen.
3. System displays a list of available hotels based on the user's search criteria.
4. User selects a hotel from the list.
5. System prompts user to enter details such as check-in date, check-out date, number of rooms, etc.
6. User fills in the required details.
7. System calculates the total cost and displays the payment summary.
8. User confirms the booking details.
9. System processes the payment transaction securely.
10. System confirms the hotel booking with a booking ID and sends a confirmation email or notification to the user.
11. User receives the booking confirmation and can view the booking details in the app.

Postconditions:

- System updates the user's booking history with the new hotel booking details.
- User can access the booked hotel details under their account.

Alternative Courses:

5a. User searches for a specific hotel not listed.

5a.01. System displays a message indicating no results found.

5a.02. User can retry with different search criteria or contact support.

Exceptions:

- User may abandon the booking process at any step before confirming the payment.

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

Diagram:

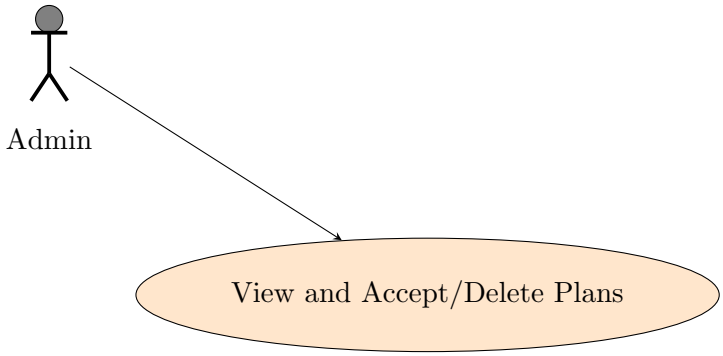

Figure-3.6: Use Case 06

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

Main Success Scenario:

1. **Admin logs into the Odyssey Travels admin panel.**
2. Navigates to "Manage Travel Plans" section.
3. Views list of submitted plans.
4. Selects a plan for detailed review.
5. Reviews plan details (itinerary, user info, pricing).
6. Evaluates plan against criteria.
7. Accepts plan: updates status, notifies user.
8. Deletes plan: removes from system, notifies user.
9. Records decision and notes.

Postconditions:

- Plan status updated in database.
- User notified of plan status.

Alternative Courses:

- Requests additional info or corrections from user.
- Communicates via internal messaging or email.

Exceptions:

- Technical issues hindering plan access.
- Admin postpones review.

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

Diagram:

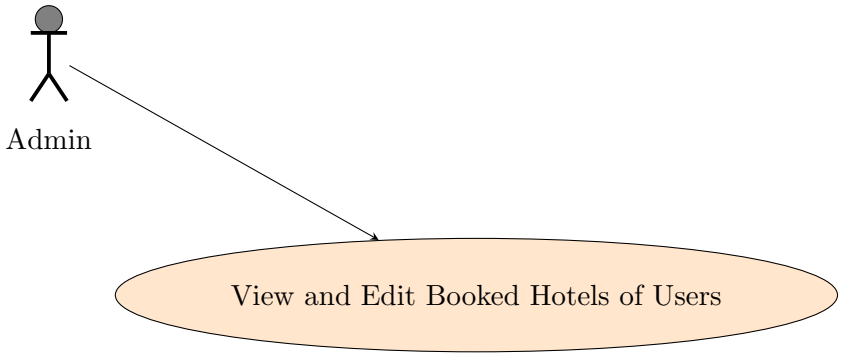

Figure-3.7: Use Case 07

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

Main Success Scenario:

1. Admin logs into the Odyssey Travels admin dashboard.
2. Navigates to "Manage Booked Hotels" section.
3. Views list of booked hotels with user details.
4. Selects a booked hotel for editing.
5. Reviews booking details (dates, rooms, preferences).
6. Edits booking information as required.
7. Confirms changes and updates the booking.
8. Notifies user of any modifications.

Postconditions:

- Booking details updated in the system.
- User notified of changes made.

Alternative Courses:

- Requests additional information or clarifications from the user.
- Provides support or resolves issues related to the booking.

Exceptions:

- System downtime affecting access to bookings.
- Admin defers editing due to unforeseen circumstances.

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

Diagram:

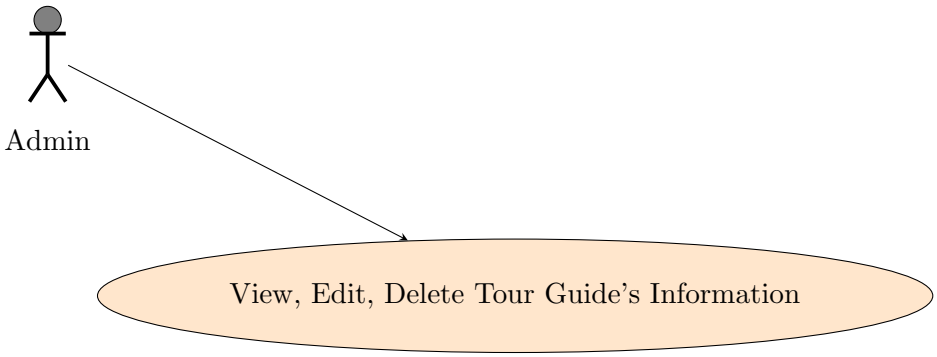

Figure-3.8: Use Case 08

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

Main Success Scenario:

1. Admin logs into the Odyssey Travels admin dashboard.
2. Navigates to "Manage Tour Guides" section.
3. Views list of registered tour guides with their details.
4. Selects a tour guide for viewing or editing.
5. Reviews tour guide's information (contact details, certifications).
6. Edits tour guide's information as required.
7. Confirms changes and updates the tour guide's profile.
8. Deletes tour guide's profile if necessary, after confirmation.

Postconditions:

- Tour guide's information updated or deleted as per admin's actions.
- System reflects changes immediately.

Alternative Courses:

- Admin requests additional documentation or updates from the tour guide.
- Provides feedback or support regarding certification requirements.

Exceptions:

- Technical issues or system errors may delay updates.
- Admin decides to defer deletion due to ongoing bookings or other dependencies.

3.3 Use Case Diagram

A use case diagram is pivotal in illustrating a user's engagements with the system, depicting the correlation between the user and various use cases they engage in. This diagram serves to provide a comprehensive overview of the system and supports the detailed design process.

Use Case Diagram :

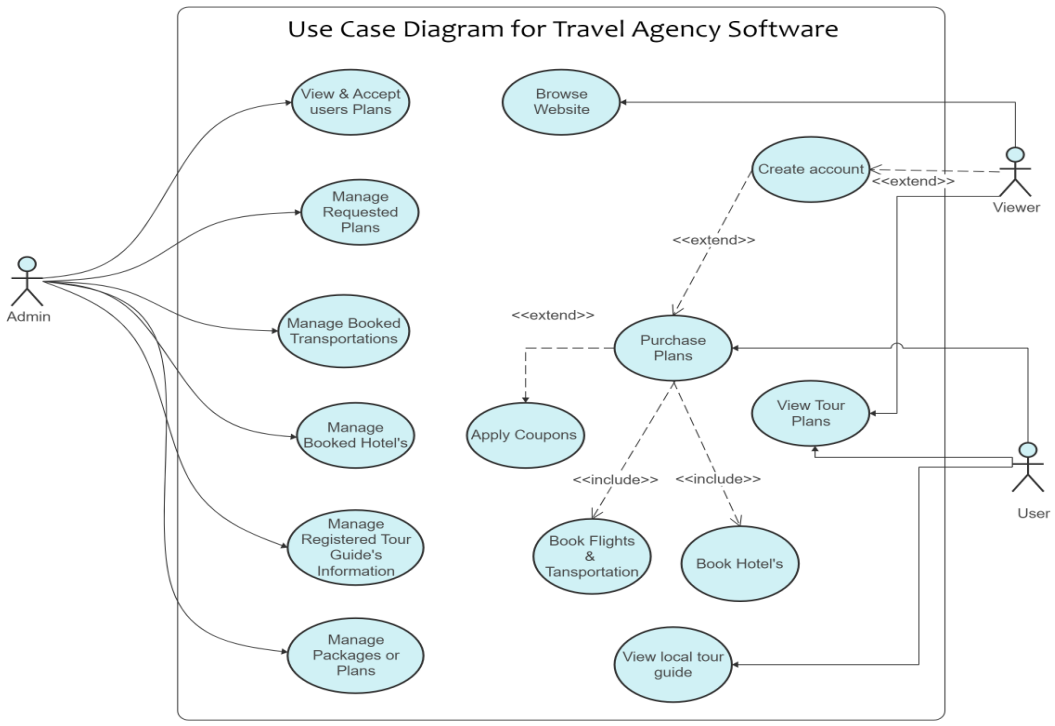

Figure - 3.4 : Use Case Diagram For Travel Agency Software

3.4 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. The system verifies the provided information and authenticates the user. Once authenticated, the user confirms the booking details, including choosing transportation and accommodation options. The system processes the booking request and updates its database accordingly. Following successful booking, the system sends a confirmation message to the user, finalizing the transaction. Throughout this process, error handling mechanisms are in place to manage cases such as incorrect credentials or incomplete registrations. The sequence diagram effectively captures these interactions, detailing how information flows between the user and the system components involved in booking a travel package.

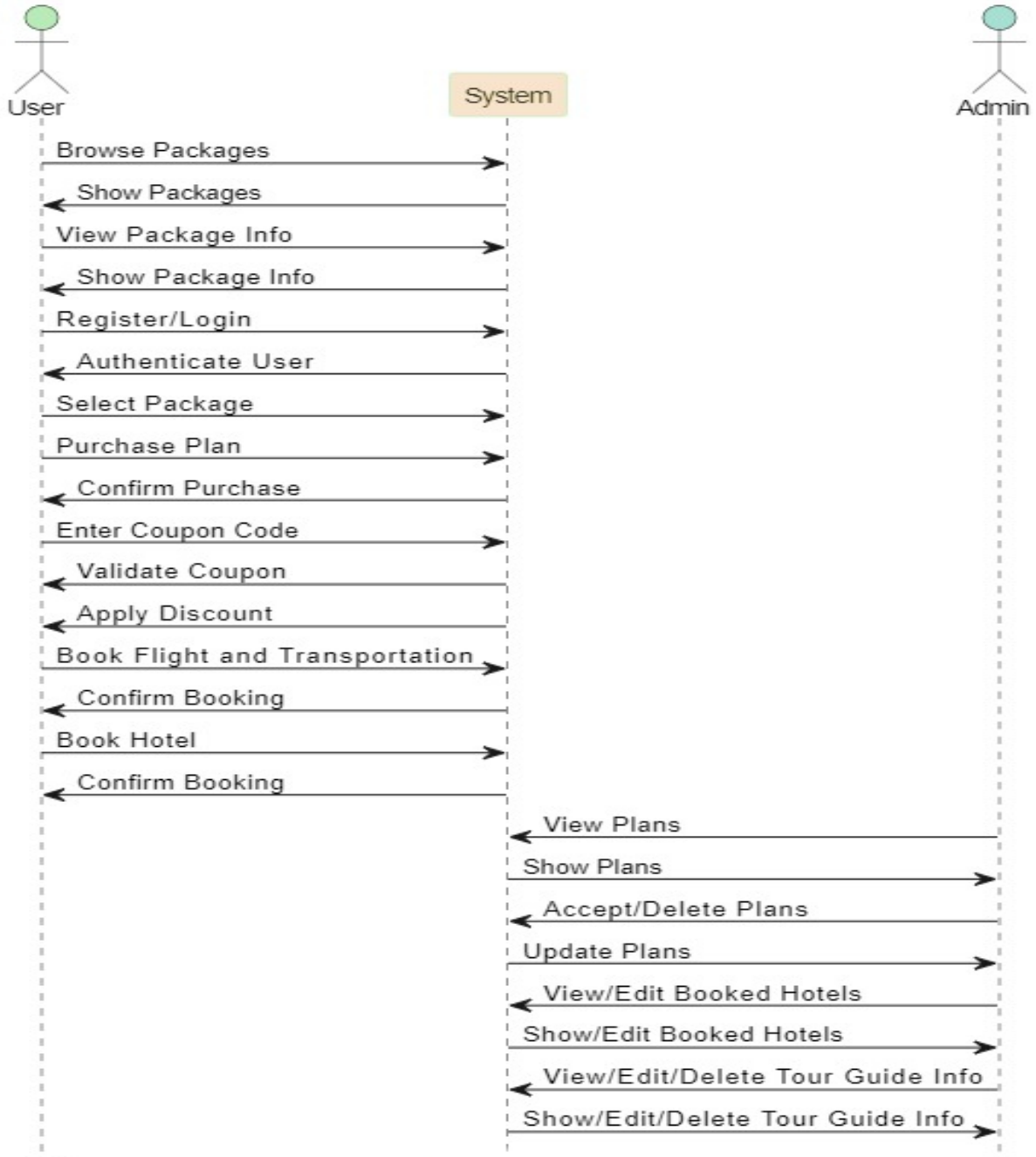

Figure - 7.9 : Sequence Diagram For Travel Agency Software

3.5 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.

3.6 Level-0 Data Flow Diagram

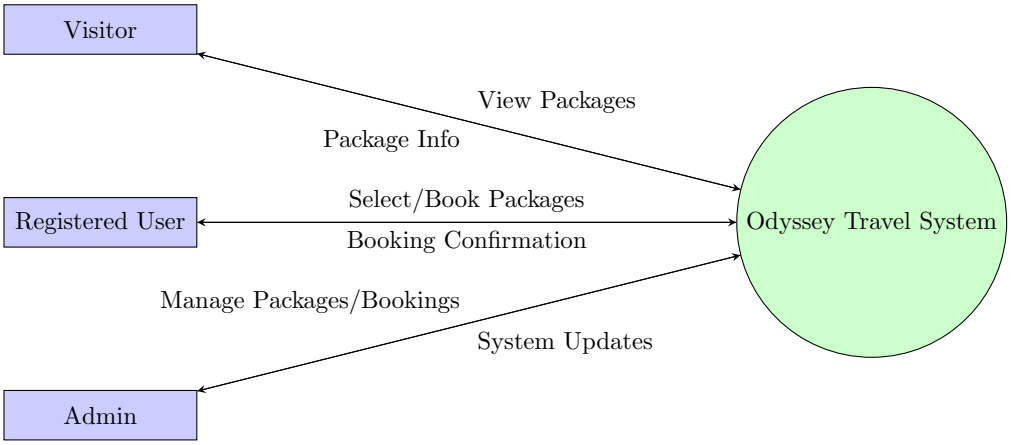

Figure-3.6: Level 0 DFD of Travel Agency Software

3.7 Level-1 Data Flow Diagram

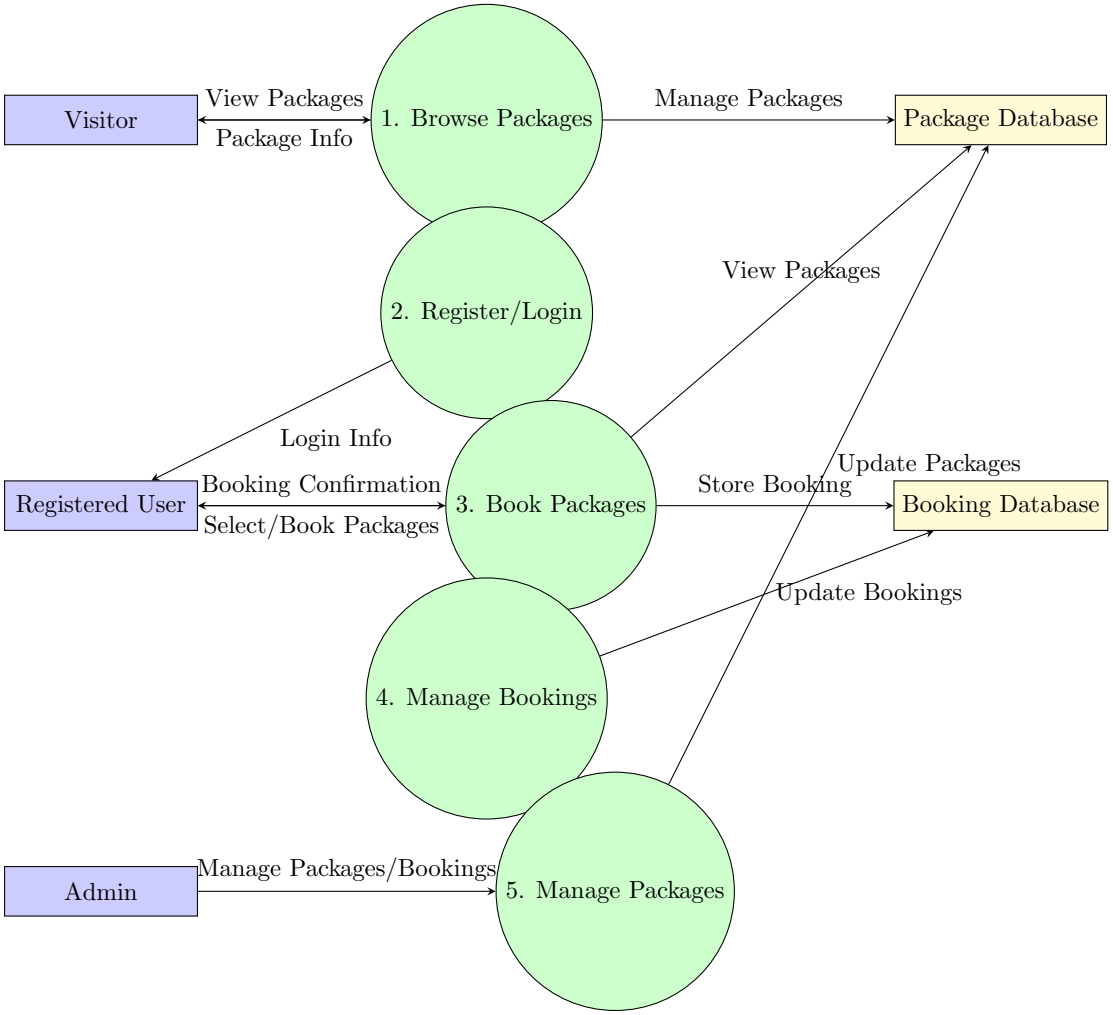

Figure-3.7: Level 1 DFD of Travel Agency Software

3.8 Entity Relationship(ER) Diagram

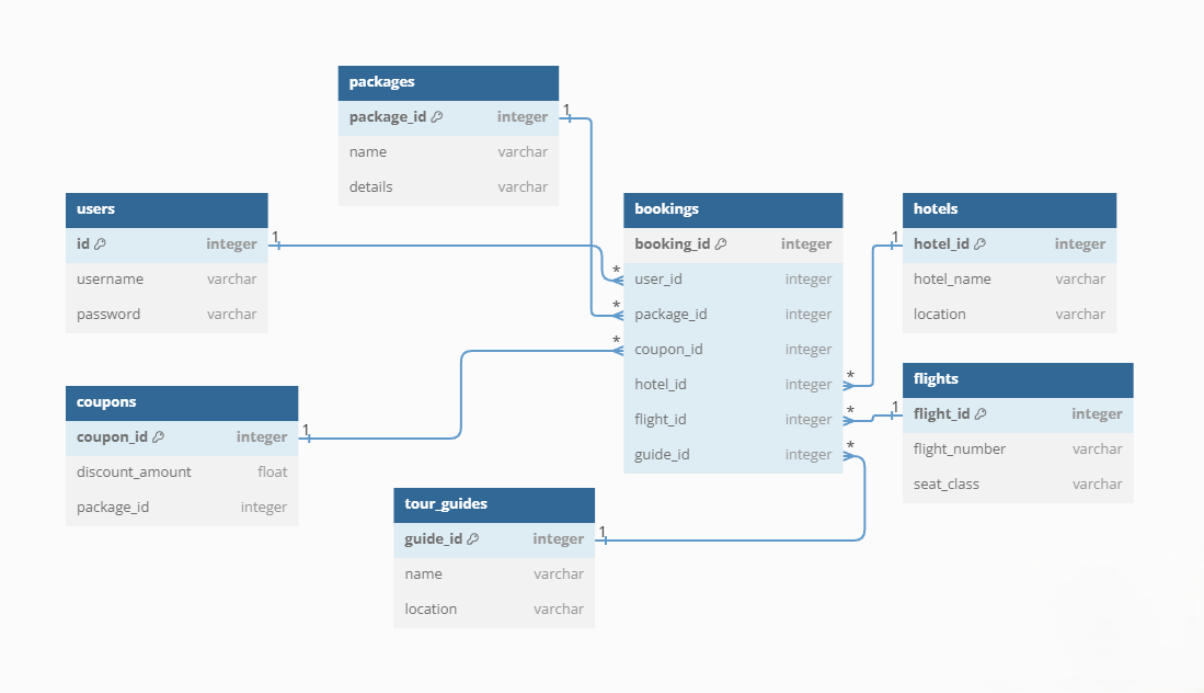

Figure - 3.8 : Entity Relationship(ER) Diagram For Travel Agency Software

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.