



Final Report For



Marwed | Tourist guide app in Saudi Arabia

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1. Customer Statement of Requirements(CSR)

1.1 Problem Statement

In a world where technology continues to shape how we explore and experience new places, a significant challenge remains unaddressed. Residents and visitors in Saudi Arabia often struggle to find reliable, up-to-date information about events, attractions, and services. The lack of a unified platform makes planning outings an overwhelming and time-consuming task.

As an enthusiastic resident of Saudi Arabia, I frequently found myself lost in a sea of websites, social media pages, and mobile applications, all providing scattered and often conflicting details. Whether I was looking for a local sports event, a new restaurant, or a hidden cultural gem, I had to piece together information from multiple sources, never quite sure of its accuracy. This fragmented system led to wasted time and countless frustrating experiences.

On several occasions, I eagerly planned an outing based on recommendations I found online, only to discover upon arrival that the venue was closed, the event was canceled, or reservations were fully booked. The challenge was even greater when coordinating group activities with friends and family, each of us relying on different sources, often leading to confusion and missed opportunities.

International visitors faced additional hurdles. While I am comfortable navigating information in both Arabic and English, many non-Arabic speakers struggle to access detailed and reliable tourism details. This language barrier not only affected their experience but also limited Saudi Arabia's ability to showcase its rich cultural heritage to a global audience. Friends from abroad often shared their frustration about the overwhelming and unstructured nature of travel information, making them hesitant to explore new places.

Then, there is Marwed, a beacon of hope and a game-changer. Marwed is the answer we have all been waiting for.

Marwed, a revolutionary mobile application, is here to solve these problems once and for all. Marwed seamlessly consolidates all essential tourism related information into one intuitive platform, ensuring residents and visitors have easy access to real-time updates about events,



venues, and attractions. With just a few taps, users can explore everything Saudi Arabia has to offer without the hassle of scouring multiple sources.

Marwed takes reliability seriously. The platform verifies event details, venue availability, and service information to ensure users receive the most accurate updates. Trust in the platform soars as users confidently plan their outings, knowing they are relying on a dependable source. Its user-friendly interface enhances the experience, allowing seamless navigation and effortless planning.

For international visitors, Marwed bridges the language gap, offering multilingual support that ensures everyone can access critical travel information with ease. This not only enriches their travel experience but also strengthens Saudi Arabia's reputation as a world-class tourist destination.

By achieving its core objectives, Marwed makes travel planning effortless, reliable, and enjoyable. It aims to increase user engagement, simplify access to information, foster seamless communication between users and service providers, and ultimately enhance the tourism experience for all residents, visitors, and businesses alike.

◆ Main Goal

The main goal of Marwed is to provide a centralized, user-friendly platform that simplifies tourism planning in Saudi Arabia. By integrating real-time updates, verified information, and multilingual support, Marwed ensures that residents and visitors can effortlessly explore events, attractions, and services, enhancing their overall experience.

◆ The Motivations of the Proposed Idea

The motivation behind Marwed stems from the growing need for a unified and efficient tourism platform that benefits both users and service providers. By consolidating reliable travel information in one place, Marwed eliminates the frustration of navigating multiple sources and reduces the uncertainty associated with event and venue availability.

With Marwed, users can seamlessly plan their outings, make informed decisions, and enjoy stress-free experiences. The platform fosters innovation by enabling businesses and event organizers to reach a broader audience while ensuring that users receive real-time, trustworthy



updates. The integration of multilingual support makes Saudi Arabia more accessible to international visitors, enriching their journey and boosting the country's global appeal.

◆ The Objectives

- Discover Trending Locations: Users can explore popular destinations, events, and activities based on their interests and location.
- Seamless Booking: The app enables users to make reservations for restaurants and events directly through the platform.
- Ratings and Reviews: Implementing a robust ratings and reviews system allows users to share their experiences, helping others make informed decisions about events, restaurants, and attractions.
- Exploration of Saudi Arabia: The app provides insights into different regions, helping users discover new places across the country.
- Real-Time Updates: Marwed ensures that all information remains up to date, minimizing the risk of users encountering closed venues or canceled events.
- Verified Information: Ensuring all listings are accurate and up to date, reducing misinformation and outdated details.
- Social Coordination: Users can coordinate plans with friends and family, managing shared reservations and group activities
- Seamless Communication: The platform facilitates direct communication between users and service providers, allowing for reservations, inquiries, and event confirmations within a single interface.
- Multilingual Support: By offering content in multiple languages, Marwed ensures accessibility for both local residents and international visitors, enhancing their overall experience.

Marwed is more than just a mobile application—it is a transformative solution that redefines how people explore and experience Saudi Arabia. By tackling the current challenges head-on, it creates a seamless, engaging, and enjoyable tourism experience for all.



1.2. Glossary of terms

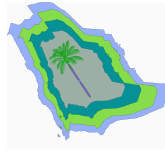
TERM	DESCRIPTION
Filter	A feature that allows users to refine search results based on specific criteria, such as location, price range, type of attraction, or availability. It helps users quickly find the most relevant options.
Customer services	Support provided to users before, during, and after their experience on the platform. This includes answering inquiries, handling complaints, assisting with bookings, and ensuring a smooth user experience.
Comprehensive Tourism Guide	A detailed and organized resource that provides in-depth information about destinations, attractions, activities, cultural experiences, and travel tips. It helps users explore Saudi Arabia with well-structured content.
Reservation	This refers to holding a spot for a specific service without necessarily making an immediate payment. A reservation may require confirmation from the service provider and can sometimes be canceled without a penalty.
Verified Information	Reliable, fact-checked, and regularly updated data about destinations, activities, events, and services. This ensures that users get accurate and trustworthy details, enhancing their planning experience.
Integrated Calendar	A feature that displays events, bookings, and availability of services in a unified and interactive format. Users can plan their trips by viewing scheduled events, upcoming reservations, and important dates in one place.



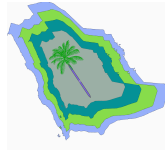
2. System Requirements:

2.1. Enumerated Functional Requirements

REQ - ID	DESCRIPTION
REQ -1	A user shall be able to create a new account by providing a unique email address, a password (8+ characters), and basic personal information, including full name, phone number, and gender.
REQ -2	A user shall be able to log in by providing an email and a password, when the account already exists. The account shall lock for 15 minutes after 5 failed attempts (wrong password/username).
REQ -3	The system shall check in the database if the email address has been used already in another existing account, if so, the system should print an error message showing “This email has already been used”.
REQ -4	The system shall send a confirmation email within 2 minutes to the user after account registration to verify their email address.
REQ -5	A user shall be able to reset their password by requesting a password reset link via email.
REQ -6	The system shall send a password reset link to the user’s registered email address. The email shall be sent within 1 minute (link will be valid for 1 hour).
REQ -7	A user shall be able to set a new password after clicking the reset link and verifying their identity via SMS.
REQ -8	A user shall edit their profile (name, preferences, saved locations), preview changes, and choose to save or cancel, with all updates reflected immediately upon confirmation.
REQ -9	A user shall be able to search for attractions, restaurants, and activities based on their location which can be filtered by distance, ratings, or popularity, and the system will display all the related options.



REQ -10	A user shall be able to filter places by type, such as activities, and shopping centers by choosing their preferred type from the filter option, and the system shall display all the related places immediately.
REQ -11	The system shall allow users to book activities and restaurants by selecting a date, time and number of guests. The system shall display availability, confirm the booking, and send a confirmation email.
REQ -12	A user shall be able to make a booking for multiple people by selecting the number of people during the booking process. The system must check whether the person already exists in the user's contacts and prevent duplicate entries.
REQ -13	A user shall be able to view their existing bookings and perform actions such as modifying booking details or canceling the booking directly through the app. When modifying a booking, the system must check the availability of the new date and time, and the update shall be performed through the calendar.
REQ -14	The system shall allow a user to view both their past and upcoming bookings through the calendar. Users shall be able to navigate the calendar to view, filter, or sort bookings by date or status (past/upcoming).
REQ -15	A user shall be able to leave reviews and ratings for places they have visited through the app. The system shall only allow reviews and ratings to be submitted for completed bookings
REQ -16	The system shall provide personalized recommendations for activities and restaurants based on a user's preferences and booking history. Recommendations shall be displayed on the user's home screen, and the system shall continuously update them as the user's preferences and booking history change.
REQ -17	The system shall integrate multiple payment methods, including credit/debit cards, Apple pay, Google Pay, and Mada. A user shall be able to securely select their preferred payment method. The system must ensure smooth and secure payment processing with proper encryption.
REQ -18	A user shall be able to change the region within Saudi Arabia through the app and access different restaurants and activities specific to that region. The system shall update the displayed options based on the selected region.



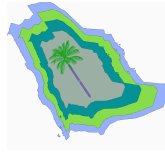
REQ -19	The system shall support multiple languages, including Arabic and English, allowing users to switch between languages. The system must detect the user's language preference based on their device settings or allow them to manually select their preferred language from the settings menu.
REQ -20	The system shall send booking confirmations and reminders via notifications. Users shall receive a confirmation notification immediately after booking, including details such as date, time, and location.
REQ -21	The system shall notify users about new activities and discounts through notifications. Users shall have the option to customize notification preferences to receive updates based on their interests.
REQ -22	A user shall be able to access a help section within the app that includes FAQs and step-by-step guides to assist with common issues and features. The help section shall be easy to navigate and searchable.
REQ -23	A user shall be able to contact customer service via email through the app. The system shall allow users to easily send their issues directly from the app.

2.2. Enumerated Non-functional Requirements

REQ - ID	DESCRIPTION
REQ -24	The system shall respond to user requests within 2 seconds under normal load conditions, defined as 500 requests per minute. The system must meet this response time standard for 95% of all requests.
REQ -25	The system shall support at least 100,000 concurrent users without performance degradation, ensuring that response times remain within acceptable limits (2 seconds per request) and that the system can handle peak usage without errors.
REQ -26	Search results for attractions and bookings shall be displayed within 3 seconds of the user's request under normal load conditions. The system must ensure that search queries are processed efficiently, with relevant results presented in an organized and user-friendly manner.
REQ -27	Personal data shall be stored and processed in compliance with Saudi Arabia's data protection laws. The system must implement appropriate security measures (such as encryption) to protect user data.



REQ -28	The app shall be optimized for both mobile (iOS & Android) and tablet devices, ensuring that the user interface is responsive and adapts to different screen sizes and orientations. The system must provide a consistent and user-friendly experience across all device types, with appropriately sized buttons and layout adjustments that enhance usability.
REQ -29	The system shall maintain 99.9% uptime, ensuring minimal downtime for maintenance. Scheduled maintenance shall be communicated to users in advance and performed during off-peak hours to minimize disruption. Unscheduled downtime should be resolved as quickly as possible.
REQ -30	The app shall be fully compatible with the latest stable versions of iOS and Android, ensuring optimal performance, responsiveness, and user experience across all supported devices. The app must be tested and optimized for compatibility with these versions, addressing any platform-specific features or updates to ensure seamless functionality.
REQ -31	The system shall integrate seamlessly with Google Maps and Apple Maps, providing users with accurate location data and directions. The integration must allow users to interact with map features without any errors.
REQ -32	The system shall be designed with a modular structure to support easy maintenance, scalability, and integration of new features. Each module shall include comprehensive documentation covering functionality, dependencies, and integration points to ensure smooth efficient future updates.
REQ -33	The app shall support automatic updates, ensuring users receive the latest features and performance improvements with minimal user intervention. Updates shall be designed to install seamlessly in the background where possible without disrupting the user experience.
REQ -34	The app shall provide offline access to previously saved content such as bookings. This content shall be stored locally on the user's device when accessed online and remain available without an internet connection to ensure basic functionality in offline mode.



2.3. On-Screen Appearance Requirements



Figure 1: Opening the

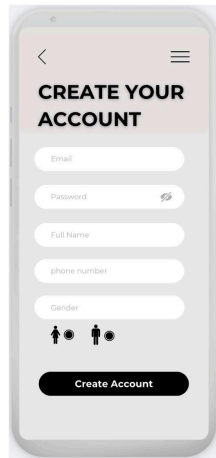


Figure 2: Sign-up page

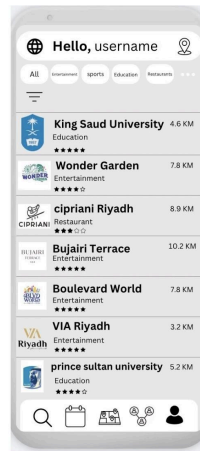


Figure 3: Home page, click on the place to show more information

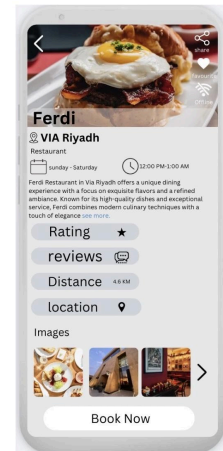


Figure 4: A place with a reservation

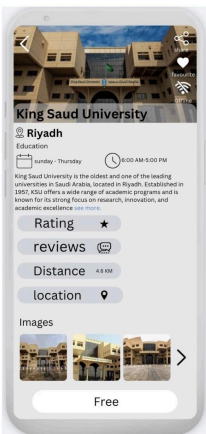


Figure 5: A place without a reservation

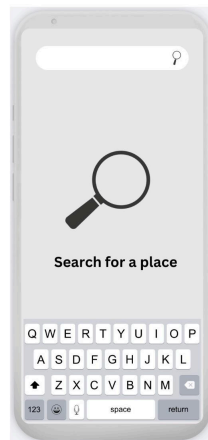


Figure 6: search page, it's reachable by clicking on the search icon in the home page

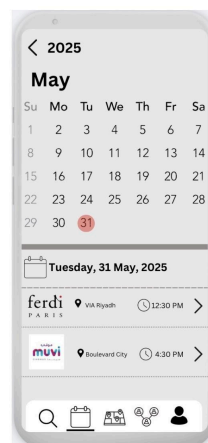
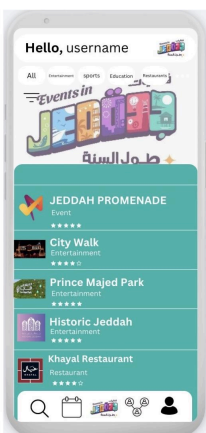


Figure 7: Calendar page



Figure 8: Zones page



10 Figure 9: Home page after selecting a zone

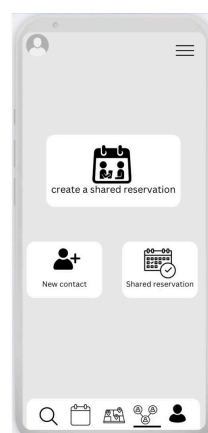


Figure 10: Connections page

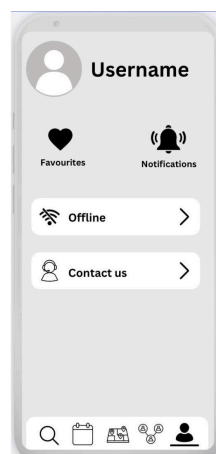


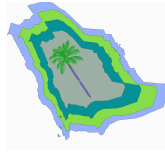
Figure 11: User profile page



3. Functional Requirements Specification

3.1 . Stakeholders

- **Users:** They can be Individuals (residents and tourists) who use the platform to explore places, events, and services.
- **business owners:** Owners of restaurants, entertainment venues, and other businesses who list their services on the platform.
- **Saudi Tourism Authority:** Government entity overseeing tourism development and ensuring the system aligns with national tourism goals.
- **Saudi Entertainment Authority:** Regulates and supports entertainment activities in Saudi Arabia and may contribute to event listings and updates.
- **System Administrators:** Support team very important and indispensable to the application and the users, processing and avoiding problems that may occur at any time.
- **Developers:** Responsible for building, maintaining, and improving the system.



3.2. Actors and Goals

Actor	Type	Goal
Users	initiating	To use the system and benefit from its advantages
Business Owners	initiating	To promote their businesses and attract more customers.
System Administrators	participating	To maintain the system and ensure security and smooth operation.
developers	participating	To develop the system and to satisfy the user's need and expectations
Saudi Tourism Authority	participating	To oversee and regulate tourism-related content.
Saudi Entertainment Authority	participating	To ensure entertainment-related events are accurate and up to date.
Database	participating	The storage system that is used to store users information



3.3. Use Cases

3.3.1. Casual Description

Use Case ID	Name	Short Description	Corresponding REQ-id
UC1	Register and Verify User	A user creates a new account by providing an email, password, and personal details.	REQ-1- REQ-3- REQ-4-
UC2	Log in	A user logs into their account using email and password.	REQ-2-
UC3	Reset Password	A user requests a password reset, receives a reset link, and sets a new password.	REQ-5- REQ-6- REQ-7-
UC4	Manage Profile	A user can view or update their profile details(email,username,ph one number, preferences,locations.)and save it.	REQ-8-
UC5	Discover places and activities	Users can discover places and activities by proximity and distance, choose from filter options (entertainment,	REQ-9- REQ-10-



		restaurants, sports) and view additional information on the selected place.	
UC6	Book an Activity	A user books an activity or restaurant through the app.	REQ-11-
UC7	Modify/Cancel Booking	A user modifies or cancels a booking.	REQ-13-
UC8	View Past and Upcoming Bookings	A user checks past and upcoming bookings.	REQ-14-
UC9	Make Payment	A user makes a payment using credit/debit cards, Apple Pay, Google Pay, or Mada.	REQ-17-
UC10	Leave Review and Rating	A user leaves reviews and ratings for visited places.	REQ-15-
UC11	Booking for Multiple People	The user makes a booking for himself and additional guests (friends or family e.g.) but they must be added first via their email.	REQ-12-
UC12	Add contact	Add a person via their email, whether a friend or a family member, so that a joint booking can be made.	REQ-12-
UC13	View shared reservations	All users view shared	REQ-14-



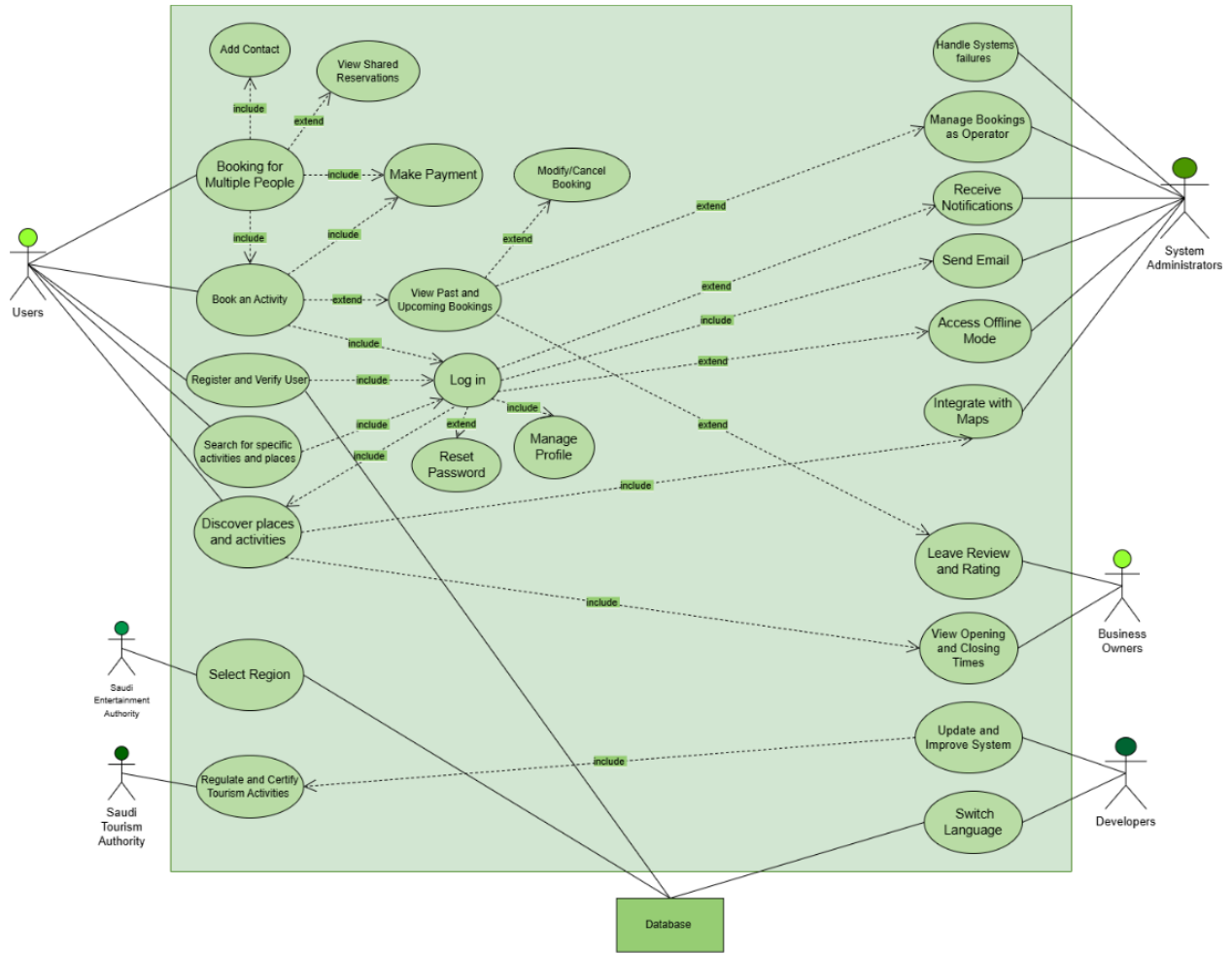
		reservations, whether past or upcoming.	
UC14	Search for specific activities and places	User can search for specific attractions, restaurants and events.	REQ-9-
UC15	Select Region	A user changes their region within Saudi Arabia to view different attractions.	REQ-18-
UC16	Access Offline Mode	The user may access some of the application content without the Internet, but he must download it in advance.	REQ-34-
UC17	Receive Notifications	Users receive notifications for bookings, new attractions, and special offers.	REQ-20- REQ-21-
UC18	Switch Language	The system provides an option to switch between Arabic and English.	REQ-19-
UC19	Send Email	Allows the user to send an email to the software team	REQ-23-
UC20	Integrate with Maps	The system integrates with Google Maps and Apple Maps for location-based search where the distance	REQ-31-



		of places and activities is shown in kilometers(KM).	
UC21	Regulate and Certify Tourism Activities	The competent authorities are able to regulate and approve tourism activities to ensure compliance with laws and standards.	REQ-27-
UC22	View Opening and Closing Times	Allows users to view the operating hours and days of attractions, restaurants and activities.	REQ-9- REQ-10-
UC23	Manage Bookings as Operator	Enables operators to manage, confirm, or modify bookings as needed.	REQ-11- REQ-13- REQ-14-
UC24	Handle Systems failures	Ensures that the system has mechanisms to recover from errors and send notifications in the event of a service failure.	REQ-29- REQ-32-
UC25	Update and Improve System	Allows the system to support automatic updates and future modifications without user intervention.	REQ-33-



3.3.2. Use Case Diagram





3.3.3. Fully-Dressed Description

UC6<Booking an Activity>	
This use case describes the process of a user booking an activity or restaurant through the app.	
Initiating Actor: User	Participation Actor: Database, business owners, system administrators
Actor Goal: Successfully book an activity or restaurant.	
Pre-condition: The user is logged into the app and has chosen the desired filters.	
Post- condition: The activity or restaurant booking is successfully created and confirmed, and the user can view it in their calendar.	
<p>Flow of Events for success scenario:</p> <ol style="list-style-type: none"> 1. The system displays the available options on the home page. 2. The user selects an activity or restaurant from the available options on the home page. 3. The system displays details about the selected activity or restaurant. 4. The user clicks the “Book Now” button to proceed with the activity booking. 5. The system presents a booking form where the user can choose the required details, such as date and time. 6. The user reviews the selected activity details and confirms the reservation. 7. The system redirects the user to the payment gateway. 8. The user completes the payment process and returns to the confirmation page. 9. A confirmation message is displayed on the screen, and the user receives notification about the booking. 10. The user can view the booking details on the calendar. 11. The system verifies the booking details and stores them in the database. 	<p>Flow of Events for Extension (Alternate scenario):</p> <ol style="list-style-type: none"> 1. If the payment fails, the system displays an error message: “Payment could not be processed. Please try again.” 2. The user can attempt the payment again or choose a different payment method.



UC11<Booking for multiple people>	
This use case describes the process of a user booking an activity or restaurant for themselves and additional guests.	
Initiating Actor: User	Participation Actor: Database, business owners, system administrators
Actor Goal: Successfully book an activity or restaurant for themselves and additional guests.	
Pre-condition: The user is logged into the app and has added guests via email.	
Post- condition: The activity or restaurant booking is successfully created and confirmed for multiple people. The user and their invited guests can view the booking in the calendar.	
<p>Flow of Events for success scenario:</p> <ol style="list-style-type: none"> 1. The user navigates to the "Connections" page and selects the option to add new contacts. 2. The user enters the email addresses of the guests they want to add. Once added, the user proceeds to create a shared reservation. 3. The user selects an activity or restaurant from the available options on the home page. 4. The system displays details about the selected activity or restaurant. 5. The user clicks the “Book Now” button to proceed with the activity booking. 6. The system presents a booking form where the user can choose the required details, such as date and time. 7. The user selects guests from their contact list to include in the booking. 8. The system calculates the total cost based on the number of participants and displays a final booking summary. 9. The user confirms the booking and proceeds to the payment step. 10. The system redirects the user to the payment gateway to process the payment. 11. The user enters their payment details and submits the payment. 12. The payment gateway verifies the transaction and confirms payment success. 13. The system verifies the booking details and stores them in the database. 14. The user and all invited guests can view the booking details in the calendar section. 	<p>Flow of Events for Extension (Alternate scenario):</p> <ol style="list-style-type: none"> 1. If an invalid email address is provided for a guest, the system displays an error message: “Invalid email address. Please correct the guest details.” 2. The user corrects the email address and proceeds with the booking.



UC1<Register and Verify User>	
This use case describes the process of a user initiating the creation of a user account.	
Initiating Actor:Users	Participation Actor:Database
Actor Goal :Create a user account correctly.	
Pre-condition:User is viewing the signup page	
Post- condition: The user account is created and can log in to app	
<p>Flow of Events for success scenario:</p> <ol style="list-style-type: none"> 1. The user clicks on the "Create Account" button on the login page. 2. The system responds by opening the registration page for the user. 3. On the registration page, the user enters his email address in the specified email input field. 4. The user then enters a secure password in the password input field. 5. After that, he enters the required username in the provided field. 6. He also enters his phone number by writing it in the designated field and the gender by selecting the appropriate button. 7. After filling in the necessary information, the user submits the registration form. 8. The system starts the verification process by sending the account confirmation link to the email address provided by the user. 9. The user checks his email inbox and finds the confirmation email containing the link. 10. The user clicks on the confirmation link in the email to verify his account. 11. Once the user clicks on the confirmation link, the system proceeds to create a new user account. 12. The system verifies the user's email address and password. 13. The newly created user account, along with the user information associated with it, is securely stored in the system database. 	<p>Flow of Events for Extension (Alternate scenario):</p> <ol style="list-style-type: none"> 1. In the event that the user attempts to use an email or username that already exists in the system, the system displays an error message: "This username or email has already been used." 2. The user is required to modify their registration information by choosing a different, email to proceed with the registration process.



UC23<Manage Bookings as Operator>	
This use case describes how system administrators modify user bookings in response to changes or unexpected issues with the place of booking.	
Initiating Actor: System Administrators	Participation Actor: Users
Actor Goal Ensure accurate user bookings by adjusting bookings due to unexpected schedule changes.	
Pre-condition: A valid user booking exists in the system, the system administrator has the necessary permissions to modify bookings, and a scheduling issue (e.g., changed opening hours, unexpected closure) has been identified.	
Post- condition: The booking has been modified and the user has been notified.	
<p>Flow of Events for success scenario:</p> <ol style="list-style-type: none"> 1-System detects or administrator identifies an issue with the booking schedule (e.g., changed opening hours, unexpected closure). 2-Administrator logs into the system with the necessary permissions. 3-Administrator locates the affected booking in the system. 4-Administrator modifies the booking (e.g., reschedules, cancels, or adjusts details). 5-System updates the booking information and ensures data consistency. 6-User is notified of the changes via app notification. 7-User acknowledges the update, confirming the modification or requesting further changes if needed. 	<p>Flow of Events for Extension (Alternate scenario):</p> <ol style="list-style-type: none"> 1-If the system administrator attempts to modify a booking, but no suitable alternative time is available. 2-The administrator notifies the user (through app notifications) about the issue and offers options such as cancellation or waiting for availability. 3-If the user chooses to cancel, the system processes the cancellation and sends a confirmation. 4-If the user opts to wait, the system marks the booking as pending and notifies the user when a new slot becomes available.

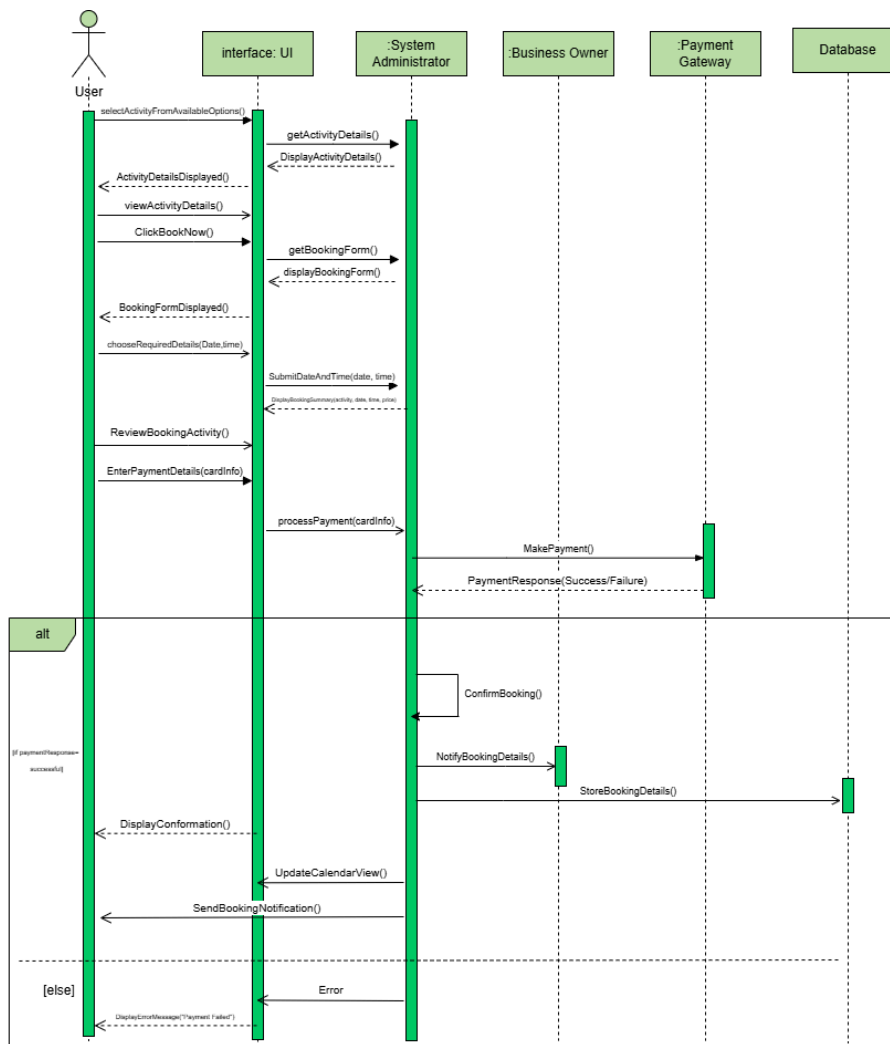


UC15<Select Region>	
This user case allows the user to change his region within the Kingdom of Saudi Arabia to view different restaurants, activities and tourist attractions.	
Initiating Actor: User	Participation Actor: System Administrators, Saudi Entertainment Authority
Actor Goal :To change the selected region within Saudi Arabia to explore relevant attractions, restaurants, and activities.	
Pre-condition :The user logs in to the platform and has access to the features of choosing the region he wants.	
Post- condition:The selected region is updated, and relevant data (restaurants, activities, attractions) for the new region is displayed.	
Flow of Events for success scenario: 1. The user navigates to the region selection page (Zone page). 2. The system displays a list of available regions within Saudi Arabia. 3. The user selects a desired region. 4. The system updates the selected region. 5. The system retrieves and displays the relevant restaurants, activities, and attractions for the chosen region. 6. The user can now explore the new region's offerings.	Flow of Events for Extension (Alternate scenario): <ul style="list-style-type: none"> ● User Cancels Selection <ol style="list-style-type: none"> 1. The user opens the region selection menu but decides not to proceed. 2. The system retains the previously selected region. ● System Fails to Load Regions <ol style="list-style-type: none"> 1. The user tries to access the region selection list, but the system fails to fetch data. 2. The system displays an error message and prompts the user to retry or check the internet connection. ● User Selects the Same Region <ol style="list-style-type: none"> 1. The user selects the current region. 2. The system detects no change and keeps the displayed information as it is.



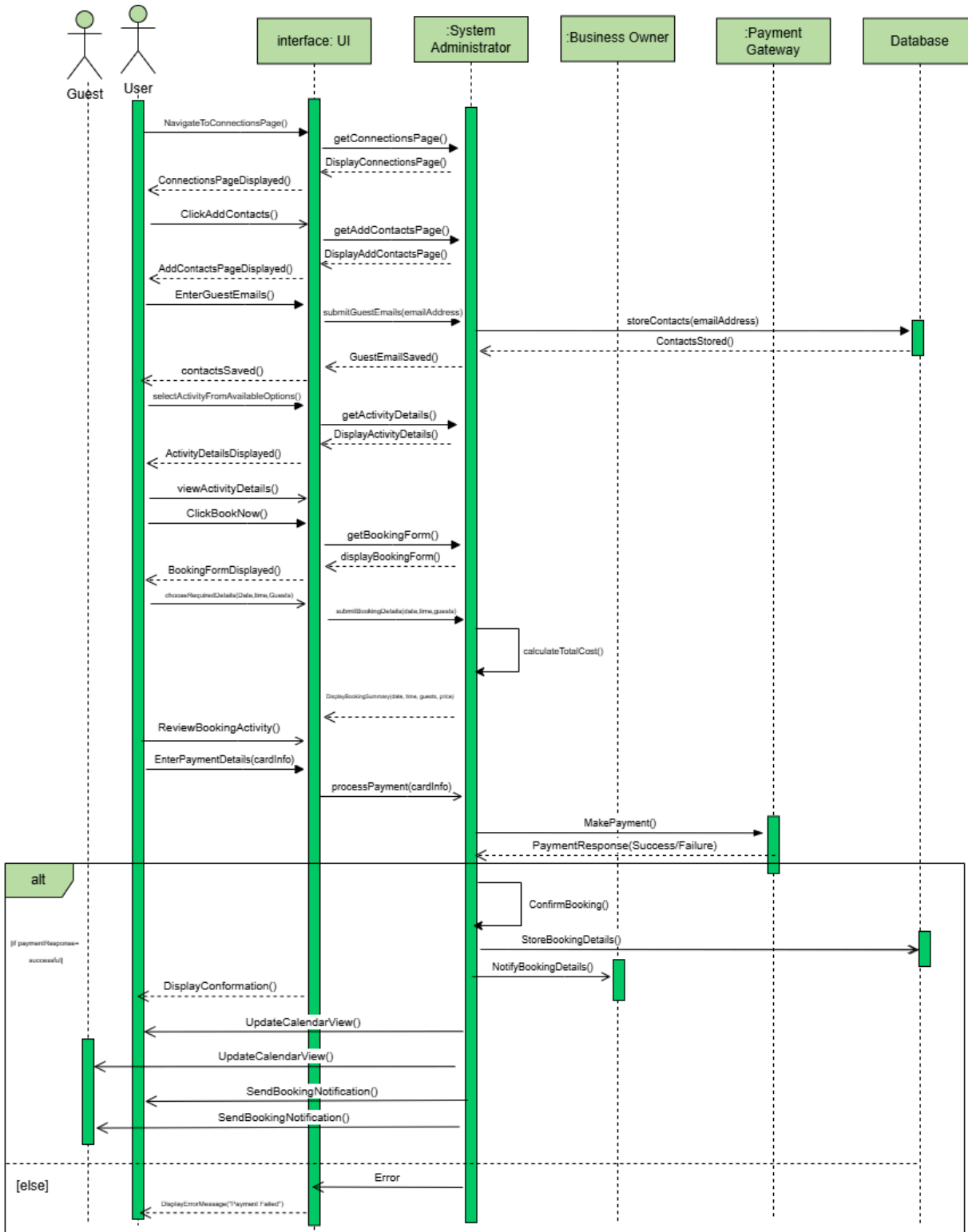
4. Interaction Diagrams

4.1. UC6 <Booking An Activity>



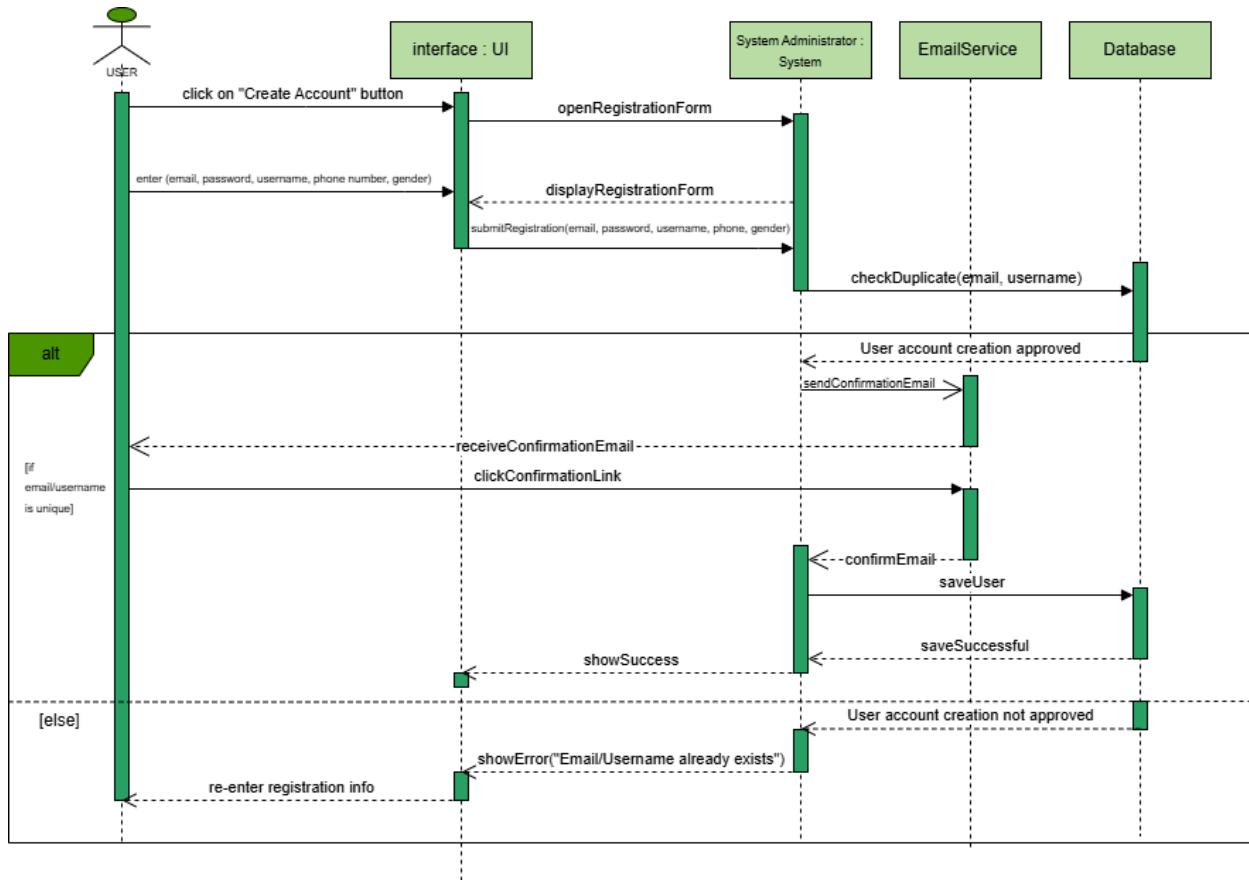


4.2.UC11<Booking for multiple people>



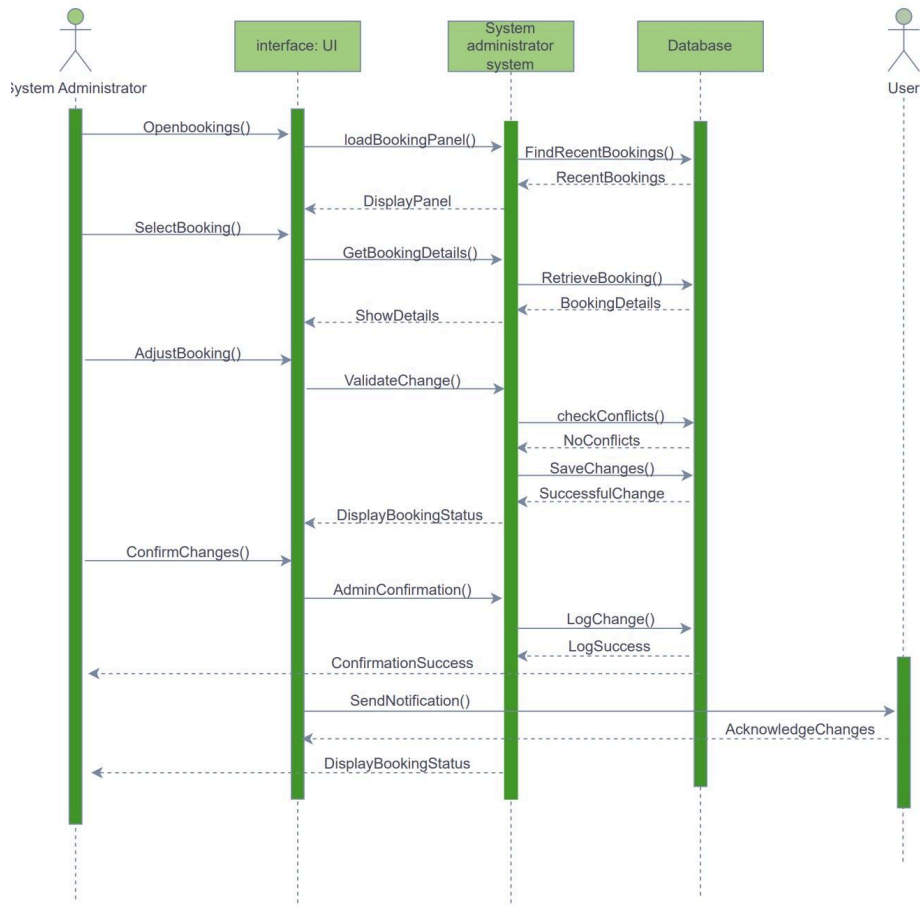


4.3.UC1<Register and Verify User>



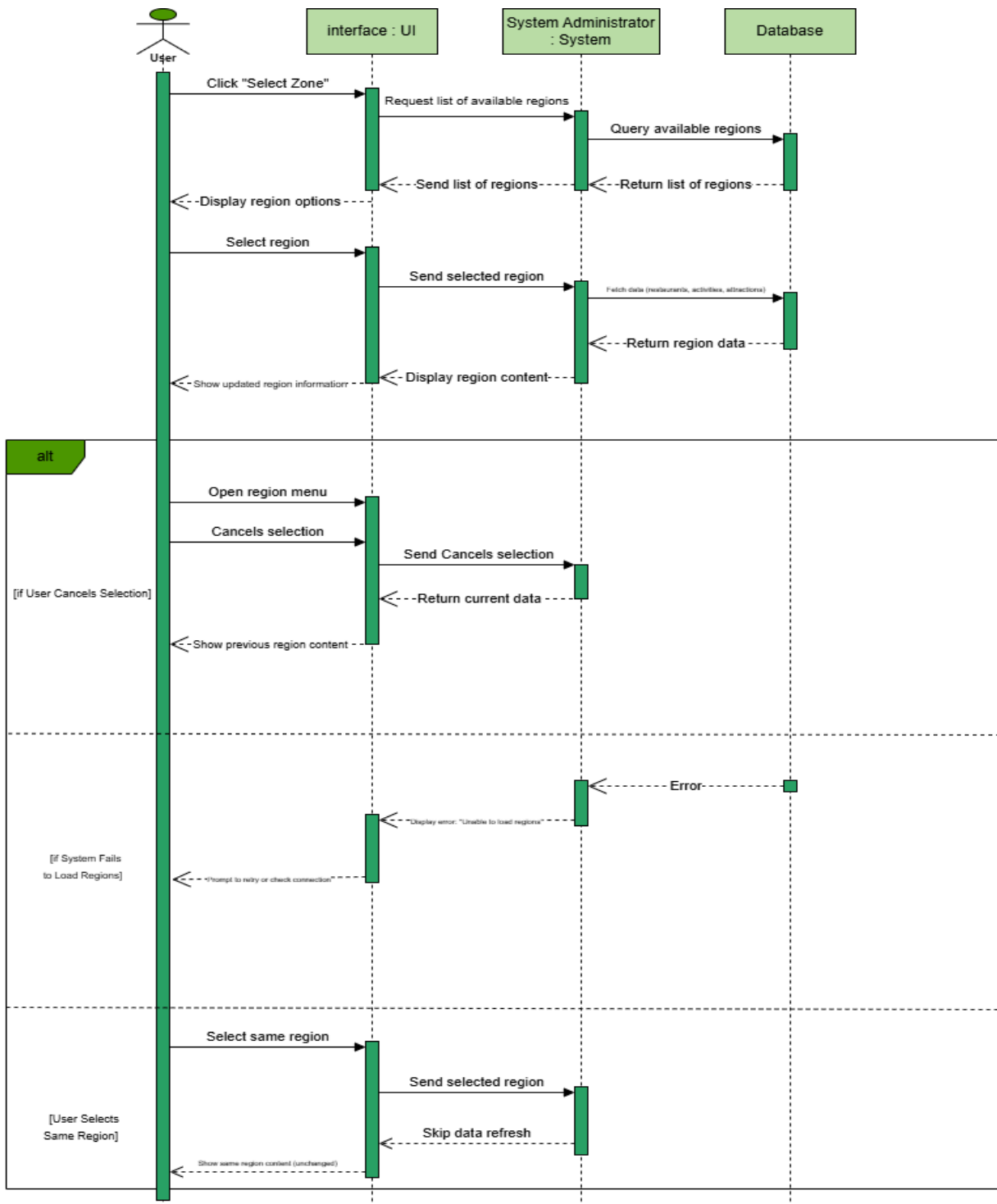


4.4. UC23<Manage Bookings as Operator>



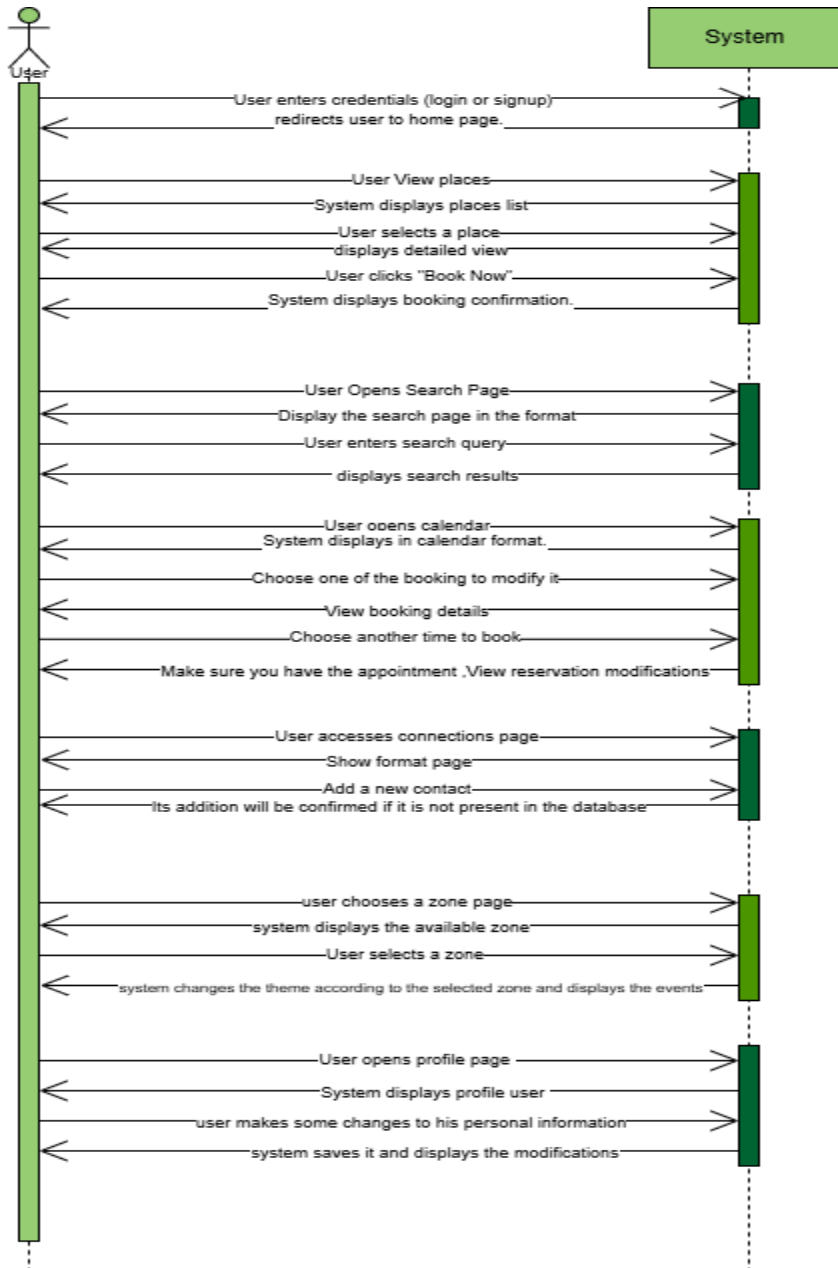


4.5.UC15<Select Region>





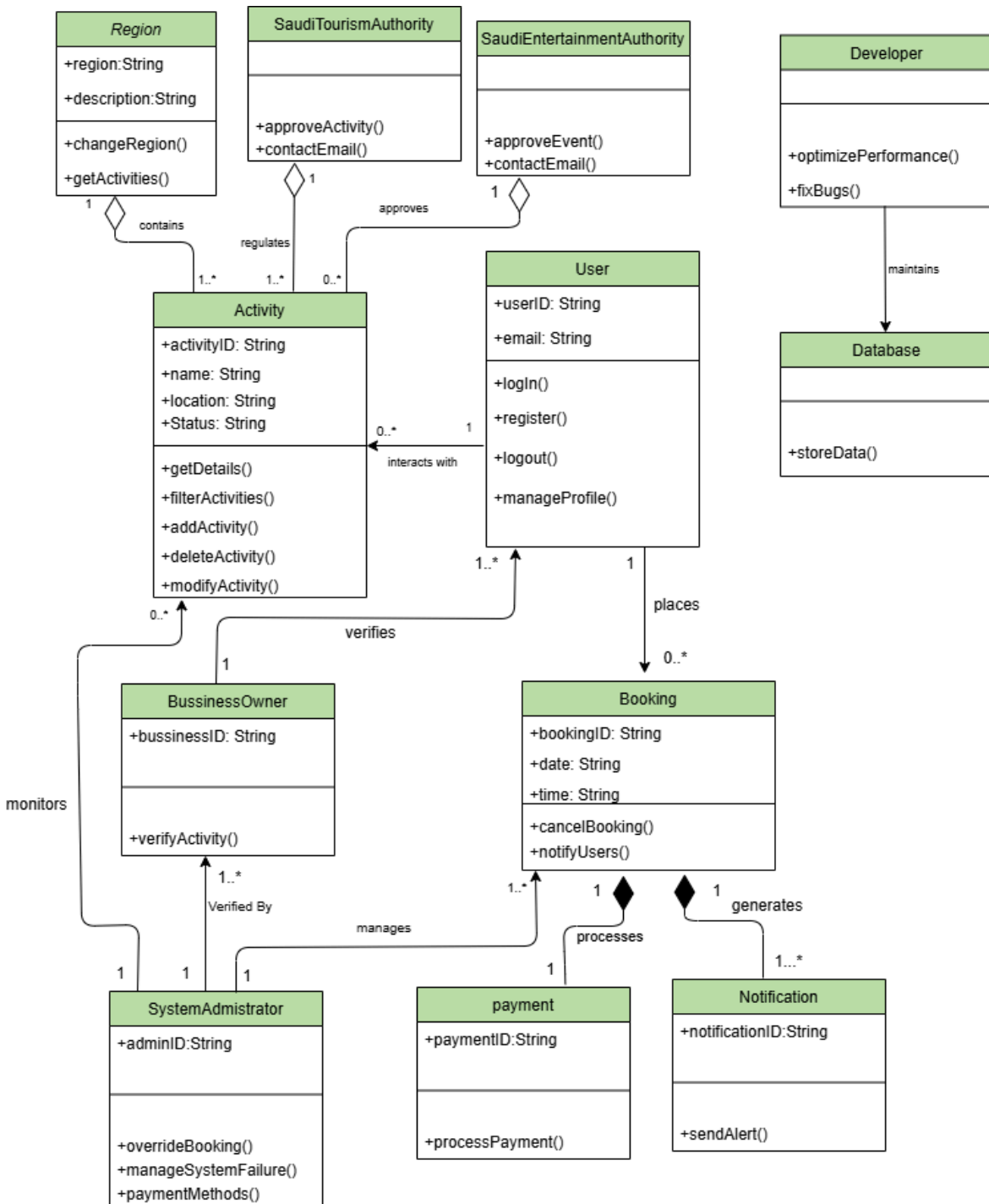
4.6. System Sequence Diagram





5. System structural diagram

5.1. Class Diagram





5.2. Class diagram description

1-User Class

Attributes

- **userID:** Represents the unique identifier for the user.
Data type: String
- **email:** Stores the email address associated with the user's account.
Data type: String

Methods

- **login():** Authenticates the user into the system.
- **register():** Creates a new user account.
- **logout():** Terminates the user's session.
- **manageProfile():** Allows the user to update their profile details.

2-Booking Class

Attributes

- **bookingID:** Represents the unique identifier for the booking.
Data type: String
- **date:** Stores the date of the booking.
Data type: String
- **time:** Stores the time of the booking.
Data type: String

Methods

- **cancelBooking():** Cancels an existing booking.
- **notifyUsers():** Sends notifications to users regarding booking status.



3-Activity Class

Attributes

- activityID: Represents the unique identifier for the activity.
Data type: String
- name: Stores the name of the activity.
Data type: String
- location: Holds the location where the activity takes place.
Data type: String
- Status: Specifies the current status of the activity.
Data type: String

Methods

- getDetails(): Retrieves details of the activity.
- filterActivities(): Filters activities based on criteria.
- addActivity(): Adds a new activity to the system.
- deleteActivity(): Removes an activity from the system.
- modifyActivity(): Updates activity details.

4-Region Class

Attributes

- region: Represents the name of the region.
Data type: String
- description: Provides a description of the region.
Data type: String

Methods

- changeRegion(): Updates region details.
- getActivities(): Retrieves activities associated with the region.



5-BusinessOwner Class

Attributes

- businessID: Represents the unique identifier for the business owner.
Data type: String

Methods

- verifyActivity(): Approves or rejects an activity.

6-SystemAdministrator Class

Attributes

- adminID: Represents the unique identifier for the system administrator.
Data type: String

Methods

- overrideBooking(): Allows the admin to override booking restrictions.
- manageSystemFailure(): Handles system failures.
- paymentMethods(): Manages payment methods in the system.

7-SaudiTourismAuthority Class

Methods

- approveActivity(): Approves activities at a higher level.
- contactEmail(): Provides contact details for inquiries.

8-SaudiEntertainmentAuthority Class

Methods

- approveEvent(): Approves events
- contactEmail(): Provides contact details for inquiries.



9-Payment Class

Attributes

- paymentID: Represents the unique identifier for the payment.
Data type: String

Methods

- processPayment(): Handles payment transactions.

10-Notification Class

Attributes

- notificationID: Represents the unique identifier for the notification.
Data type: String

Methods

- sendAlert(): send notification to the user.

11-Developer Class

Methods

- optimizePerformance(): Improves system performance.
- fixBugs(): Resolves system bugs.

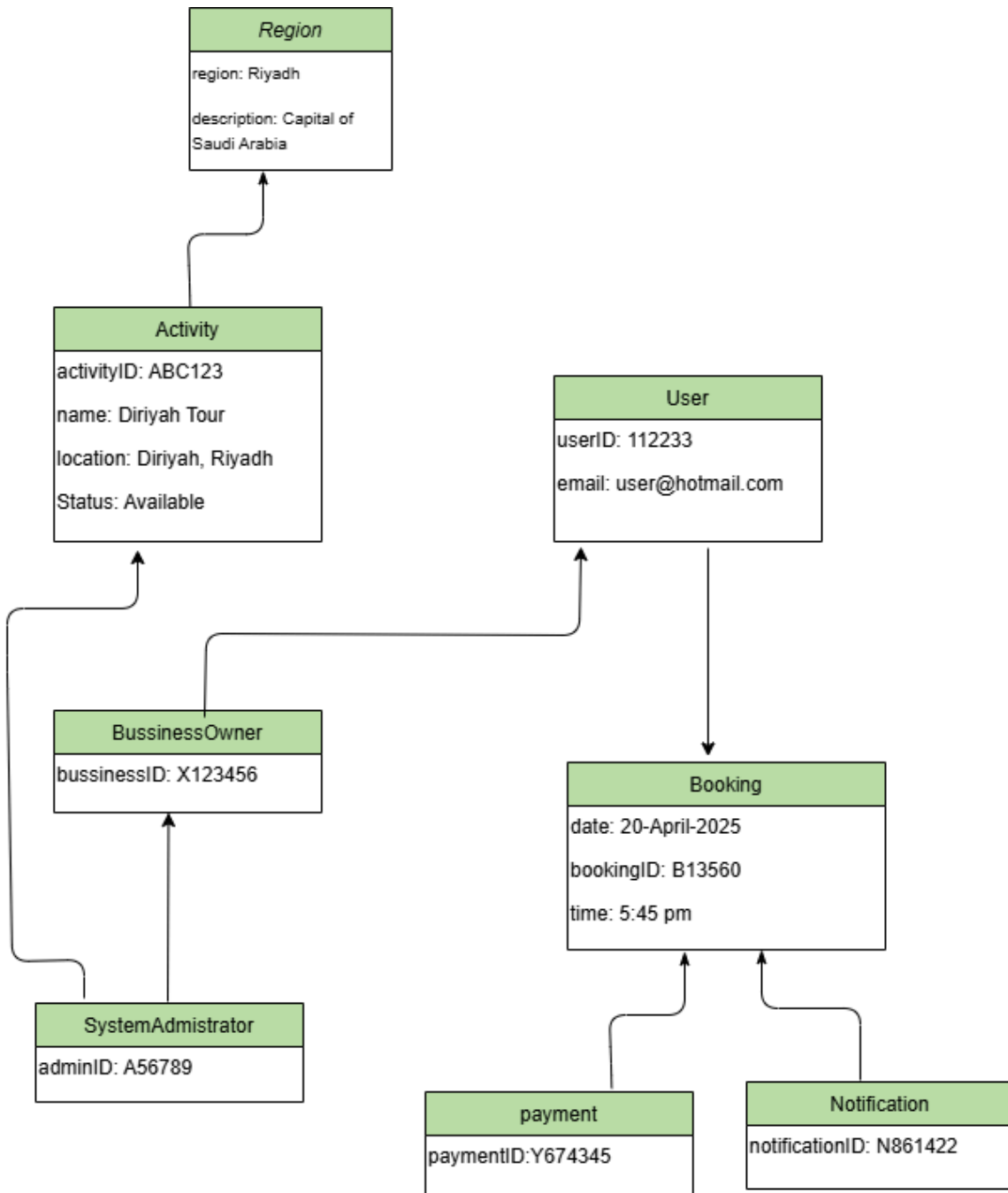
12-Database Class

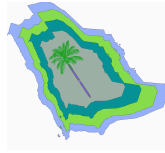
Methods

- storeData(): Saves data to the database.



5.3.Object diagram





6.The System Architectural diagram

6.1The system organization

Marwed follows a Client-Server Architecture to efficiently manage and store information while ensuring users have uninterrupted access to their data. This structure provides a centralized storage system, making it easier to handle large amounts of user and venue-related data securely. The server processes requests from users, handling data retrieval and updates as needed. Most processing happens on the server, which improves speed and performance. Additionally, having a centralized server allows multiple users to interact with the system at the same time while ensuring data security and controlled access.

6.1.1 The Data Flow Model

Marwed is built using an Object-Oriented Model (OOP), which structures the system using classes and objects. This approach makes the system flexible, scalable, and easy to maintain.

Advantages of using OOP in Marwed:

- **Encapsulation:** Protects data by keeping it inside objects, reducing the risk of unwanted modifications.
- **Inheritance:** Allows code reuse, reducing redundancy and improving maintainability.
- **Scalability:** New features can be introduced without affecting existing functionalities.

The OOP model also integrates the application's logic with the database, ensuring smooth interaction between different system components. Key objects in the system represent users, bookings, venues, and reviews, making data management straightforward and efficient.

Since Marwed is designed for iOS and Android, it is developed using programming languages that support OOP, ensuring compatibility and optimized performance.

6.1.2 The Control Model

Marwed follows an Event-Driven Model, meaning the system responds to user actions and system events dynamically. This ensures a fast and interactive experience for users.

- **User Actions Trigger System Events:** Actions like making a booking, modifying user details, or leaving a review trigger system updates.

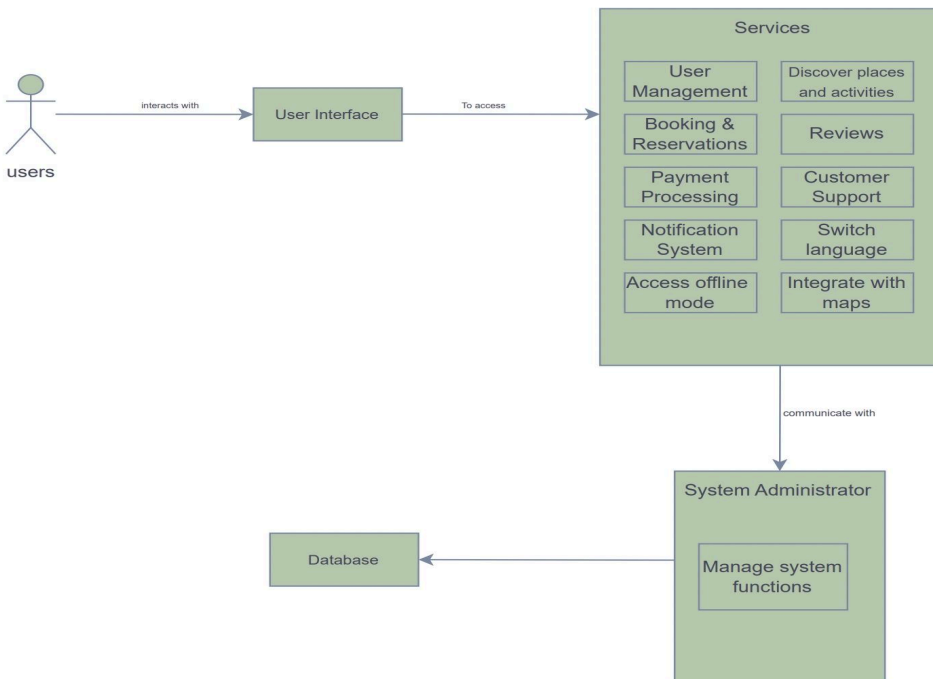


- **Real-Time Notifications:** Users receive updates on reservations, cancellations, and new events as they happen.
- **Background Processing:** Certain processes run in the background to maintain system efficiency.
- **Modular Services:** Different system components, such as authentication, booking management, and notifications, function independently to enhance system reliability.

Marwed's event-driven approach ensures real-time updates and a smooth user experience. Additionally, error-handling mechanisms are in place to address potential issues, such as failed transactions or network errors, providing users with clear guidance and solutions.

With this design, Marwed guarantees high performance, secure data management, and a seamless tourism planning experience, making it easier for users to explore and book activities effortlessly.

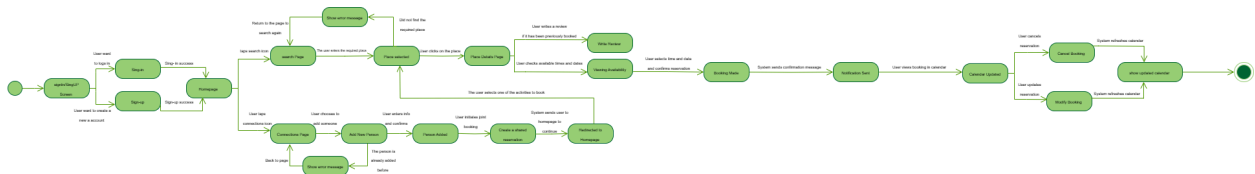
6.2 Identifying the subsystems





7. System behavioral diagram

7.1. state diagrams



*"As the image clarity was challenging to achieve, the following link provides a clearer and more accurate representation of the diagram"

https://drive.google.com/file/d/1aau9deLczUm3guWXp_Ro470NAcibXo4l/view?usp=sharing

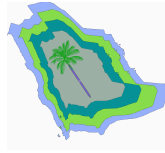
8. The design of Tests

8.1 Unit testing

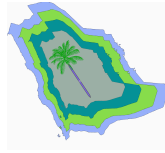
Test case ID	Use case tested	Description	Test data/input	Expected Output	When it considered pass/fail	Actual output	Any comments
TC1	UC1	Tests if the system allows a new user to register	Valid email, password, phone number, full name and gender	Takes the user to the homepage	Pass if the user entered valid input, fail if the user entered invalid input	As expected	None
TC2	UC2	Tests if the system allows a user to log-in	Valid Email and password	Takes the user to the homepage	Pass if the user entered valid input, fail if the user entered invalid input	As expected	None
TC3	UC3	Tests if the user can reset password	Valid email	Takes the user back to the log in page	Pass if the user received reset link, fail if the user didn't receive reset link	As expected	None



TC4	UC5/14	Tests if the user can discover and search for specific places and activities	User selects preferences and filters or searches for a place/ activity through the search page	Display related places/activities	Pass if the related places/activities are displayed, fail if no places/activities are displayed	As expected	None
TC5	UC6/9	Tests if the user can book an activity through the app	The user chooses the Selected activity and clicks on the book now icon and selects date/time and the payment method	Booking is confirmed and the payment is processed	Pass if the selected date/time is available and the payment method is valid, fail if the selected date/time isn't available and payment is not valid	As expected	None
TC6	UC7	Tests if the user can modify or cancel a booking	The user chooses one of their upcoming bookings and modifies this booking	Booking is modified or canceled	Pass if the modified information is valid, or the cancelation is confirmed, fail if the modified information is invalid, or the cancelation could not be processed	As expected	None
TC7	UC10	Tests if the user can leave a review and rating on a visited place	The user writes a review about the place they have visited and enters the rating	The review and rating is posted and available for all users to see	Pass if the user has visited the place via booking through the app and the review and rating is posted, fail if the user hasn't visited the place via booking through the app and the review and rating isn't posted	As expected	None
TC8	UC12	Tests if user can add a new contact so a shared booking can be made	The user clicks on the new contact icon in the connections page and enters their email	The new contact is successfully added	Pass if the contact has an account and the entered email is valid, fail if the contact doesn't have an account and the email is invalid	As expected	None



TC9	UC11	Tests if a user can book for multiple people from their contacts	The user clicks on the create a shared booking icon and enters the emails of the users and chooses the place, date/time and. Payment method	The booking is confirmed, payment is processed and the booking is added to the contacts bookings	Pass if the entered emails of contacts is valid and the booking information is valid, fail if the users enters an invalid email or the booking information is invalid	As expected	None
TC10	UC8	Tests if the user can view past and upcoming bookings	The user goes to the calendar page and selects a certain date and the bookings on that date appear	The user can view bookings on a specific date	Pass if the user is able to view bookings, fail if the user isn't able to view bookings	As expected	None
TC11	UC13	Tests if the user can view shared bookings	The user goes to the connections page and clicks on shared bookings	The user can view all shared bookings whether made by the user or by other users	Pass if the user is able to view shared reservations, fail if the user isn't able to view shared reservations	As expected	None
TC12	UC15	Tests if the user can change their region within Saudi Arabia and view different attractions	The user goes to the zones pages and selects a different region	The user can view attractions that are specific to the selected region	Pass if the user has selected a region and can view new attractions, fail if the user cannot view new attractions	As expected	None
TC13	UC16	Tests if the user can access the offline mode feature	The user has downloaded the place they want to access offline via the download icon available and then they can view these places without internet	The user can view downloaded places when they aren't connected to the internet	Pass if the user can view the downloaded places when they're offline, fail if the user can't view the downloaded places when offline	As expected	None



TC14	UC17	Tests if the user can receive notifications related to bookings, new attractions and offers	An update on a booking, or a new attraction is available or there is a new offer	User receives a notification	Pass if the user receives a notification, fail if the user doesn't receive a notification	As expected	None
TC15	UC18	Tests if the user is able to switch the language of the app	The user selects a language from the available languages	The app language is changed to the chosen one	Pass if the app language is changed, fail if the language isn't changed	As expected	None
TC16	UC19	Tests if the user is able to send and email to the software team	The user goes to the user profile page and clicks on contact us and sends an email	The email is sent to the software team	Pass if the email is sent, fail if the email isn't sent	As expected	None
TC17	UC20	Tests if the user can view the distance of places in kilometers	The user allows the app to know their location	The distance for each place is available	Pass if the user can view the distance, fail if the user can't view the distance	As expected	None
TC18	UC4	Tests if the user can update their profile page	The user updates their email, phone number, preferences and location and saves them	The changes are made successfully	Pass if the changes are made, fail if the changes aren't made	As expected	None

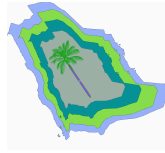


8.2 Integration testing

Test case ID	Use case tested	Description	Test data/input	Expected Output	When it considered pass/fail	Actual output	Any comments
TC19	UC6/9/17	Tests if user can Make a booking , pay and receive a confirmation notification	Selected activity/place, date/time and valid payment method	Booking is successfully made and stored, payment is successful, and the user received the confirmation notification	Pass if the booking is saved, payment is processed, and the notification appears, fail if none of the processes are successful	As expected	Tests flow across booking, payment, and notification components
TC20	UC11/12	Tests if the user can add new contacts and create a shared booking	Valid contact emails, and valid booking information	Booking is created for all selected contacts and it appears in their shared bookings	Pass if all the users in the booking can view the booking and the information is synced	As expected	Combines contact, booking, and calendar components
TC21	UC5/14/20	Tests if user can discover and search for places/activities using available filters or based on the distance of these places	A place to search for, filter preferences , and users location	Activities/ places are filtered and displayed with distance in kilometers	Pass if map updates distance based on users location, places related to the chosen filters or search are shown	As expected	Tests search engine, the filter, and map integration
TC22	UC23/17/13	Tests if when the admin modifies a shared booking the updates are available to	A shared booking, and admin modifies the shared booking	Booking updates appear for all users in the shared booking with	Pass if the users see the changes and receive notifications	As expected	Tests admin tools + booking DB + notification



		all users and the notifications are received		notifications			
TC23	UC16/5	Tests if users are able to discover downloaded places using offline mode	Downloaded places, no internet connection	User can discover downloaded places and activities when offline	Pass if the downloaded places appear while offline	As expected	Combines the offline and the discovery feature
TC24	UC1/2/4	Tests if users can register and later log in and modify their profiles	Valid registration, log in information and valid modification information	User can register and later log in and modify their profile	Pass if the user is able to register and log in and modify their profile	As expected	Combines the registration, log-in and manage profile components
TC25	UC6/8/10	Tests if user can book an activity/place and then view the booking and review/rate the activity/place after visiting it	A booking	The booking appears in the calendar and the user can review/rate the activity/place after visiting it	Pass if the user is able to make a booking and later review it and rate it	As expected	



8.3 Acceptance testing

A tourist who tested the Marwed application provided the following feedback about their experience:

Group Booking Coordination

The tourist wanted to make a booking in a restaurant for their family but found it difficult to coordinate with multiple people. They suggested adding a group booking link that could be shared via WhatsApp or email, allowing family members to confirm their spots individually.

Language Support

While exploring historical sites in Riyadh, the tourist noticed that some attraction descriptions were unclear in English. They recommended improved translations or an option for user-submitted corrections.

Event Notifications

The tourist was disappointed when a booked event was canceled last minute, but the app notification arrived too late. They proposed push notifications with live updates for any schedule changes.

Planned Improvements:

- Implement shareable group booking links with individual confirmation
- Allow users to suggest translations for unclear information
- Develop priority notification system for cancellations

We sincerely value all user feedback and will continue to improve Marwed based on these real-world experiences. The development team is currently prioritizing these enhancements for our next update cycle.



9. REFERENCES

- [1] Sommerville, I. (2010). Software Engineering: United States Edition (9th ed.). Uppersaddle River, NJ: Pearson.
- [2] PlantUML, "State Diagram", <https://plantuml.com/state-diagram>, Accessed: Apr. 20, 2025.
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