

SOFTWARE DESIGN DOCUMENT
FOR

تولّم-TWALLAM

Travelling Activity Software

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Tawallam

ACTIVITY AND BUDGET SAVING

Instructor :

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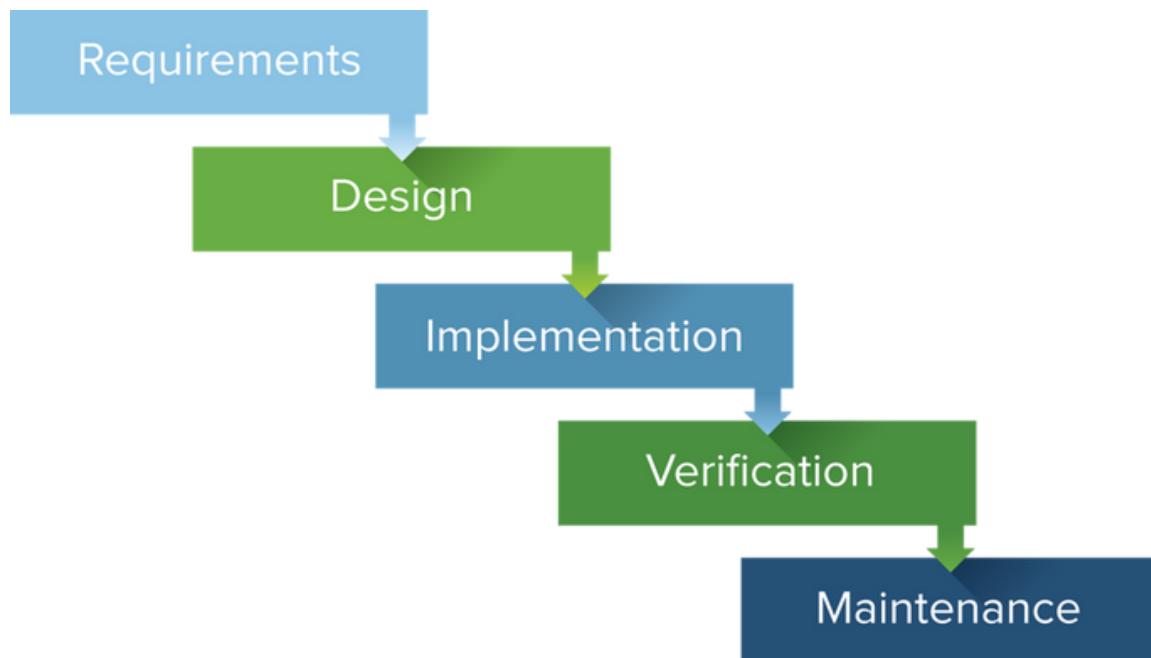
1. INTRODUCTION

1.1. SOFTWARE PROCESS ACTIVITIES AND MODELS

Any software must follow a specific strategy from planning until implementation and maintenance.

“Twallam” software follows the Waterfall method because of its extensive usage and ease of implementing clearly defined and stable requirements from the beginning of the project.

The first stage of this method was done previously in SRS which is planning, now moving to the design stage in SDD.



Waterfall Method

1. INTRODUCTION

1.2. PURPOSE

The purpose of this SDD is to define the design and architecture of the "Twallam" application, which aims to provide users with activity suggestions in Saudi Arabia cities that align with their destination and budget. It serves the following key purposes:

- **Development Roadmap:**

provides a structured roadmap for the development team.

- **Risk avoidance:**

The SDD helps identify and eliminate risks early in the development process, reducing potential problems during implementation.

- **Verification of Requirements:**

The SDD ensures that the app's design meets the specified requirements.

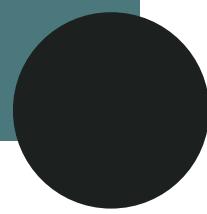
- **Collaboration and Documentation:**

The SDD promotes collaboration among team members and serves as valuable documentation for future reference, troubleshooting, updates, and maintenance efforts.

1.3. SCOPE

This software presents a holistic platform tailored for seamless activity booking across Saudi Arabia. It encompasses a diverse range of functionalities aimed at enhancing user experience. With a focus on activity discovery, users can explore cultural, adventure, and sports events spanning various regions. The booking process is streamlined, enabling users to effortlessly select, book, and securely pay for activities within the platform. Robust security measures safeguard user data and financial transactions. Moreover, its cross-platform accessibility ensures convenience across devices, catering to diverse user preferences. The inclusion of a comprehensive administrative dashboard empowers efficient system management, task handling, and monitoring of crucial user data, fostering a robust and user-friendly environment.

1. INTRODUCTION



1.4. STRUCTURE

The software introduction provides a brief explanation of the document's goal and summarizes the 'Twallam' software. The System Overview introduces the system and offers an overview of its main features, goals, and its position within the larger framework. In the System Architecture and Components section, the software's design architecture is described in-depth, covering the components in detail while analyzing the design rationale. The Data Design section describes the software's database, covers the data structure, and discusses how data flows in diagrams. The Design Details section uses Class diagrams, State diagrams, Activity diagrams, and Sequence diagrams to meet each requirement comprehensively. Finally, the Human Interface Design concludes by providing an overview of the user interface, showcasing example interfaces for the phone application, accompanied by descriptions for each interface.

1.5. REFERENCES

- [1] "Software design document template," Bit.ai, <https://bit.ai/templates/software-design-document-template#Template-Embed> (accessed Nov. 10, 2023).
- [2] "SDD (System Design Document) how to make," YouTube, <https://youtu.be/dKZSs7SShuM?feature=shared> (accessed Nov. 11, 2023).

2. SYSTEM OVERVIEW

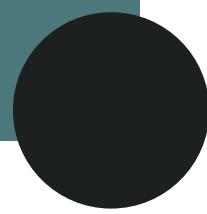
2.1. OVERVIEW

The "Twallam" software is designed to make it easier for tourists to Saudi Arabia to search and reserve a variety of activities. This is accomplished by compiling a wide variety of activities and displaying them to users according to their preferences. The application will be developed as a mobile application for Android and iOS platforms, providing a user-friendly and intuitive interface for interacting with the Twallam application.

The application will consist of several main modules, each catering to the specific needs of users. It enables users to find budget-friendly activities in cities across Saudi Arabia. Users can select a city, input their budget, and view a list of activities within or below the specified budget. The app provides filters for rating, number of guests, and cancellation policy. Users can check activity availability, make payments, and log in to manage their bookings or add it to wishlist. The app confirms reservations, updates schedules, and allows users to view and cancel bookings. Meanwhile, hosts can add a variety of activities to the system, connecting to a database that streamlines the process of updating reservations, making it faster and more efficient.

To protect user data and payment confidentiality, security measures have been implemented place. Furthermore, multiple security measures are in place to protect the host database, which secures communication between the software and the server. The entire approach delivers a safe and dependable platform for consumers as well as activity hosts. [1]

3. SYSTEM ARCHITECTURE AND COMPONENTS DESIGN

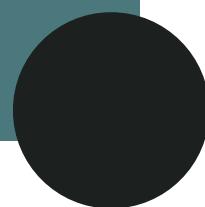


3.1. ARCHITECTURE DESCRIPTION

Twallam application provides the user with a budget and a list of available activities based on that budget. It allows the user to select a city and apply filters such as Rating, number of guests, and cancellation policy. Additionally, the program enables booking activities with availability checks, payment processing, and updating the user's schedule. Confirmation of the booking is sent via email. Furthermore, the program offers the option to cancel the booking and receive a refund, with a cancellation confirmation sent via email.

Architecture Description: The program follows a client-server architecture, with a mobile application serving as the client-side and a server-side component handling the business logic and data management tasks. External services, such as Google Maps, are integrated to enhance the user experience. The app consists of three main components: the mobile application, a server-side component, and external services integration. [1][2]

3. SYSTEM ARCHITECTURE AND COMPONENTS DESIGN



3.1. ARCHITECTURE DESCRIPTION

- **Mobile Application:**

The mobile application is developed using the Flutter framework, which allows for cross-platform compatibility across iOS and Android devices. It provides features such as user registration, login, browsing of activities, selection of activities based on budget, applying filters, adding activities to the wishlist, immediate booking, and cancellation of bookings. The application communicates with the server-side component through APIs for various functionalities.

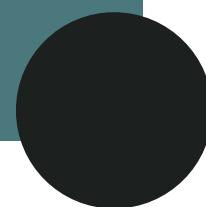
- **Server-Side Component:**

The server-side component is the fundamental and vital element in our Twallam application. It handles the business logic and data management tasks. The main functions handled by the server-side component are: user management, booking management, and payment processing. The application ensures that it is well-secured by providing secure storage and retrieval of user-related data, reservations, and payment details. In our application, we utilize a SQLite database to store and manage this data efficiently. Furthermore, multiple security measures are in place to protect the host database, which secures communication between the software and the server. The entire approach delivers a safe and dependable platform for consumers as well as activity hosts

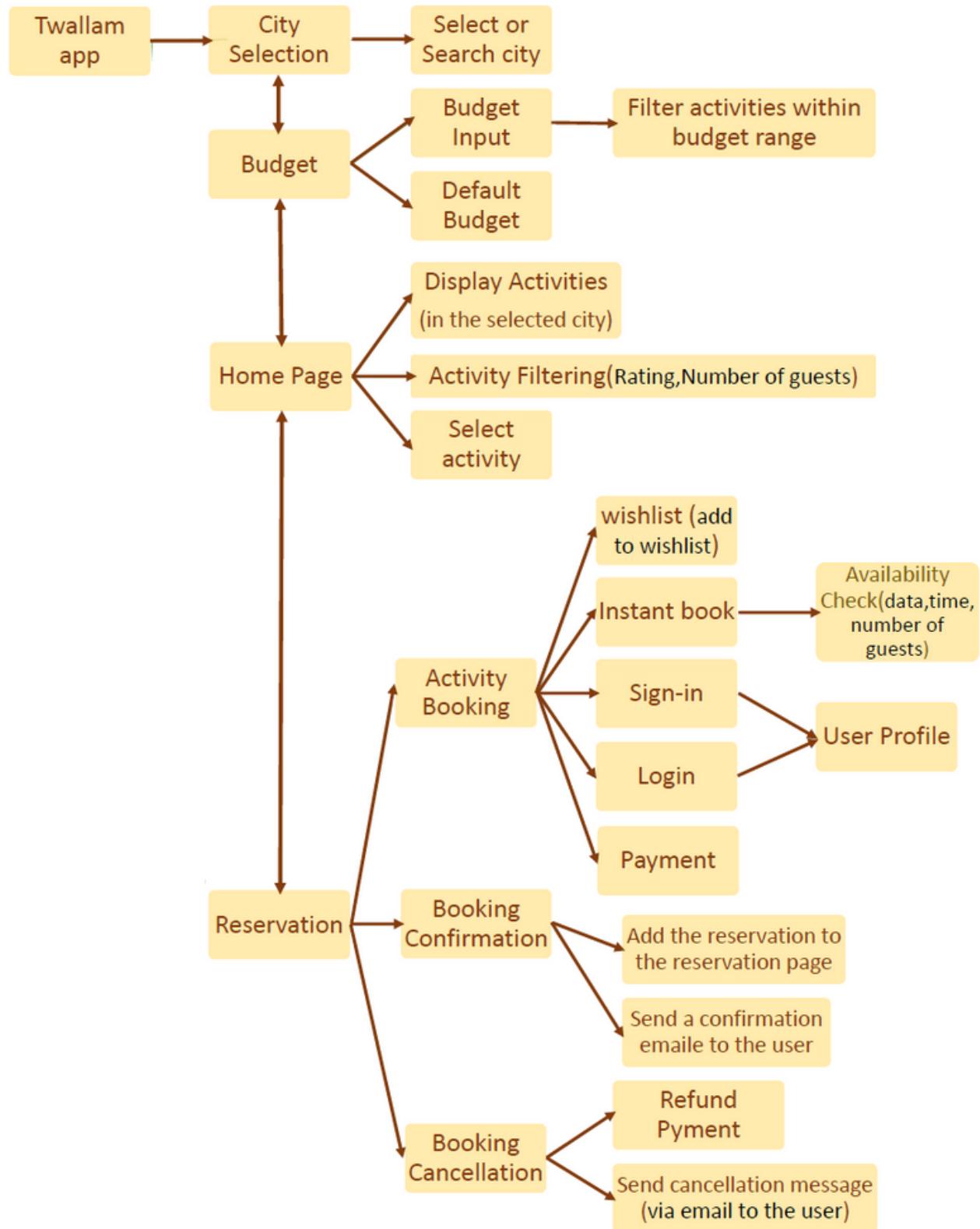
- **External Services Integration :**

To provide a seamless and flexible experience in our application, our software integrates with external services. Such as Google Maps, to provide precise location-based services. This integration enables users to discover activity venues and view their locations on the map. Additionally, it facilitates integration with payment gateways such as (PayPal, Apple Pay, Credit Cards) allows users to make seamless and secure payment transactions. [1][2]

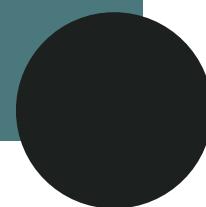
3. SYSTEM ARCHITECTURE AND COMPONENTS DESIGN



3.2. COMPONENT DECOMPOSITION DESCRIPTION [1][2]



3. SYSTEM ARCHITECTURE AND COMPONENTS DESIGN



3.3 DETAILED COMPONENTS DESCRIPTION

1. City Selection Component:

This component allows user to select among a list of cities in Saudi Arabia in order for the user to choose the city in which they want to book an activity either by viewing most popular cities or by using user current location for faster access. this component is displayed and used early in the program since the results of the activity suggestions are depending on the destination.

2. Budget Component:

This component is required in order for the system to display activities since the result depends on the user's budget. User will input their budget , if not , a default budget is already applied. A list of activities will appear based on the inputs. Now activities will be filtered based on the budget.

3. Home Page Component:

Home page component will display activities based on selected city and the user budget.

The user has the ability to filter activities based on different criteria such as rating , guest count or even cancelation policy which will make the result more specific to the user needs.

And finally select the desired activity.

4. Reservation Component:

This component is the core service of the application. It allows the user to complete and confirm booking the selected activity after authenticating the user, as well as canceling the booking if needed.

5. Activity Booking Sub-Component:

This component allows user to book the activity. User can add an activity to the wish list, it helps organizing activities if the user wishes to add more than one and complete reservation later or wait for a specific activity availability.

Availability check will notify the user weather this activity is available or not for instant booking based on selected date, time, and number of guests. If it is available and the user wish to book it , they must sign into their accounts. Then, the payment page will appear for the user to complete payment.

3. SYSTEM ARCHITECTURE AND COMPONENTS DESIGN



3.3 DETAILED COMPONENTS DESCRIPTION

6. User Authentication Sub-Component:

In order for user to complete booking , User must sign in using their personal information and should provide an OTP to ensure authentication. After successfully creating an account, the user can now log in using the email and password they provided and will be able to complete booking.

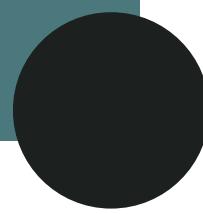
7. Booking Confirmation Sub-Component:

Once payment is done , the reservation is placed and the schedule will be updated by adding the booked activity as well as sending a confirmation email to the user.

8. Booking Cancellation Sub-Component:

To ensure a flexible and a rational user experience. the Application provides this component to support different user circumstances that may drive them to cancel their booking. A payment refund will be processed and an email to confirm cancellation will be sent.

3. SYSTEM ARCHITECTURE AND COMPONENTS DESIGN



3.4. DESIGN RATIONALE

In Tawallam application design, we ensured that the design is meets user requirements, easy to use and understand as well as secure and trustworthy. We took in consideration a specific criteria that helped in making the application environment a good experience for the user.

- **Security:**

In the context of the application design, security is paramount. The app will handle sensitive user information, including personal details and payment information. It is crucial to implement robust security measures to protect this data from unauthorized access, modification, or disclosure. That's why we implemented MFA(Multifactor authentication) for an additional layer of security. This could involve using one-time codes sent to the user's phone or email.

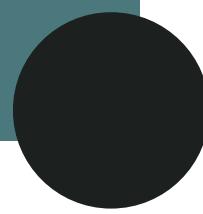
- **Seamless user experience:**

A seamless user experience is crucial for user retention and satisfaction. The app is easy to navigate, efficient to use, and enjoyable to interact with. We Employed a clean and uncluttered interface with clear visual cues and intuitive navigation. We also Implemented a powerful search function with advanced filtering options to help users quickly find the activities they are looking for.

- **Reliability:**

In the context of the activity booking app design, reliability is essential to maintain user trust and satisfaction. The app should be consistently available, perform smoothly, and handle unexpected situations gracefully.

4. DATA DESIGN



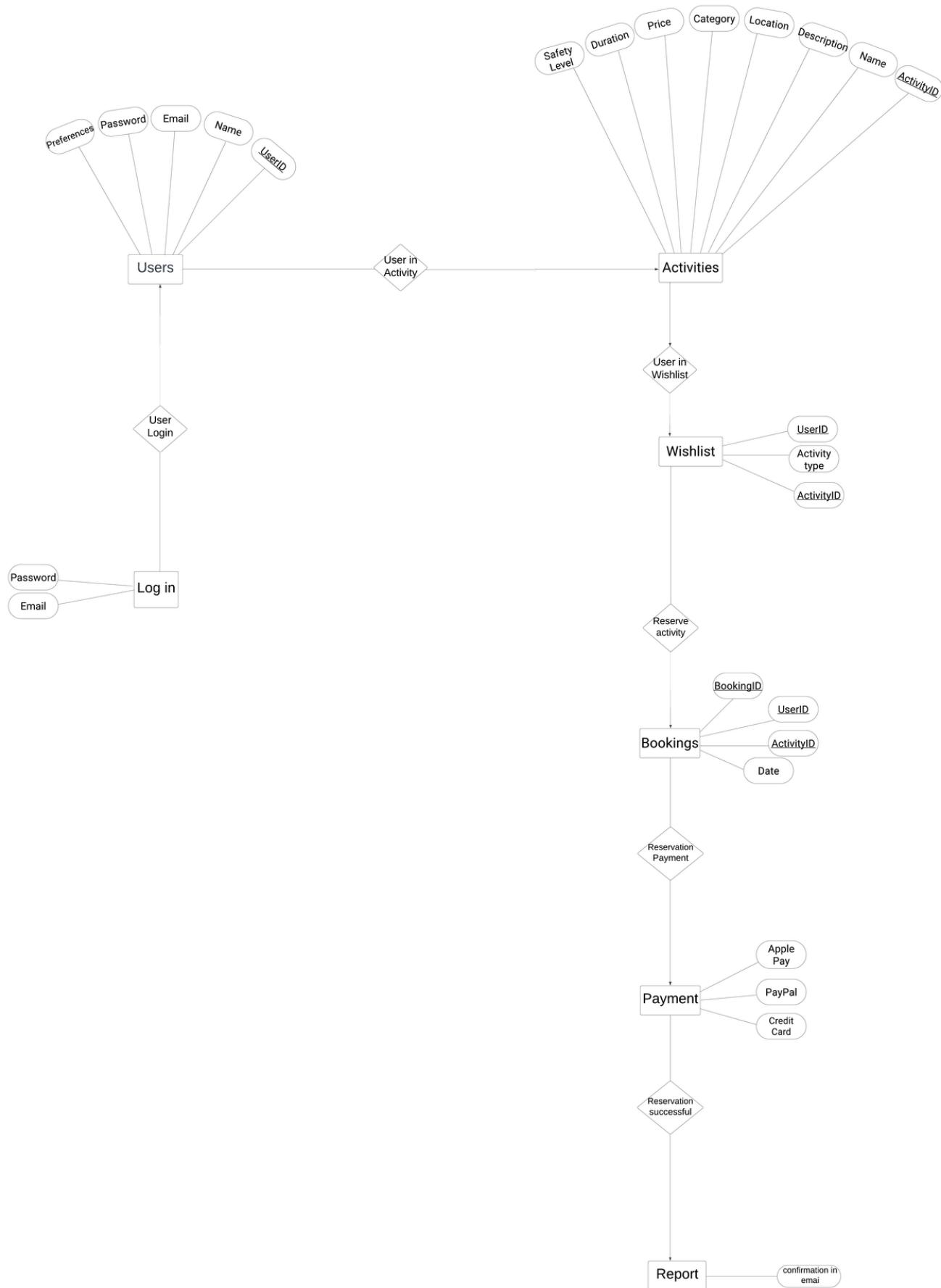
4.1. DATABASE DESCRIPTION

The "Twallam" app's database is a useful source of activity statistics, user information, and booking specifics. It is carefully designed to make it easier to manage and retrieve data about user preferences, activity details, and payment transactions. Data integrity, scalability, and smooth querying are given top priority in this database, which is implemented via a relational database management system (RDBMS). Users, Activities, Wishlist ,Bookings ,Payment, and Report there are six main tables; each has distinct columns and primary keys. The Users table has (UserID as the main key ,Name, Email, Password, and Preferences),the Activities table has (ActivityID as the main key ,Safety level, Duration, Price, Category, Location ,Description ,Name) ,Wishlist table has(UserID as a Foreign key, ActivityID as a Foreign key, Activity type), the Bookings table has(UserID as a Foreign key, ActivityID as a Foreign key, BookingID as the main key, Date), Payment table has(Apple Pay , PayPal , Credit card), Report table has(Confirmation in email)

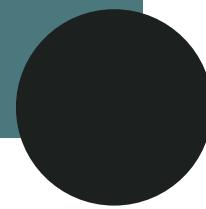
With the help of basic database operations like Insert, Update, Delete, and Query, users, bookings, and activities may be added, modified, removed, and retrieved according to predetermined criteria. Encryption of sensitive data, referential constraints to maintain data integrity, access control, and frequent backups to prevent data loss are all critical security procedures. This thorough database design provides a strong framework for managing and storing "Twallam" app data, guaranteeing both operational effectiveness and the protection of user data via strong security measures.

4. DATA DESIGN

4.2. DATA STRUCTURE

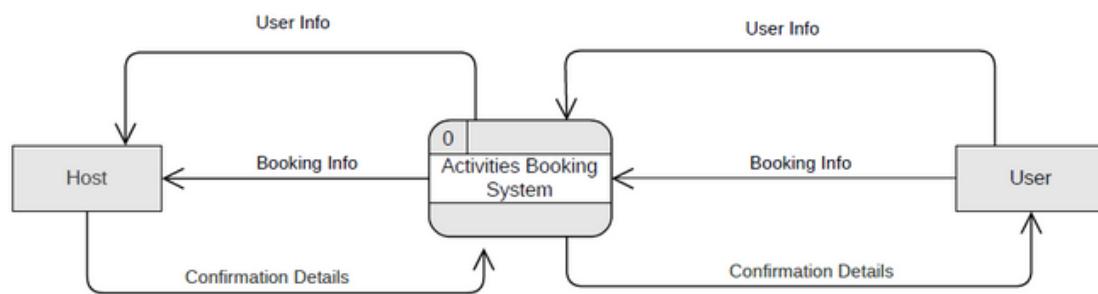


4. DATA DESIGN

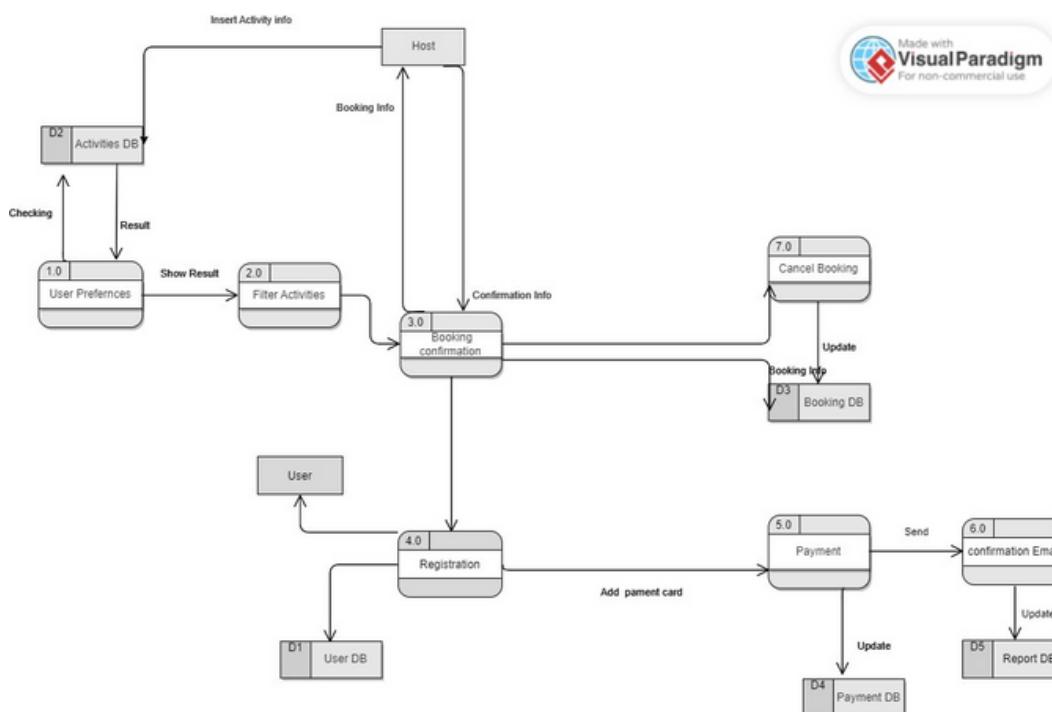


4.3. DATA-FLOW DIAGRAM (DFD)

-Context Level-



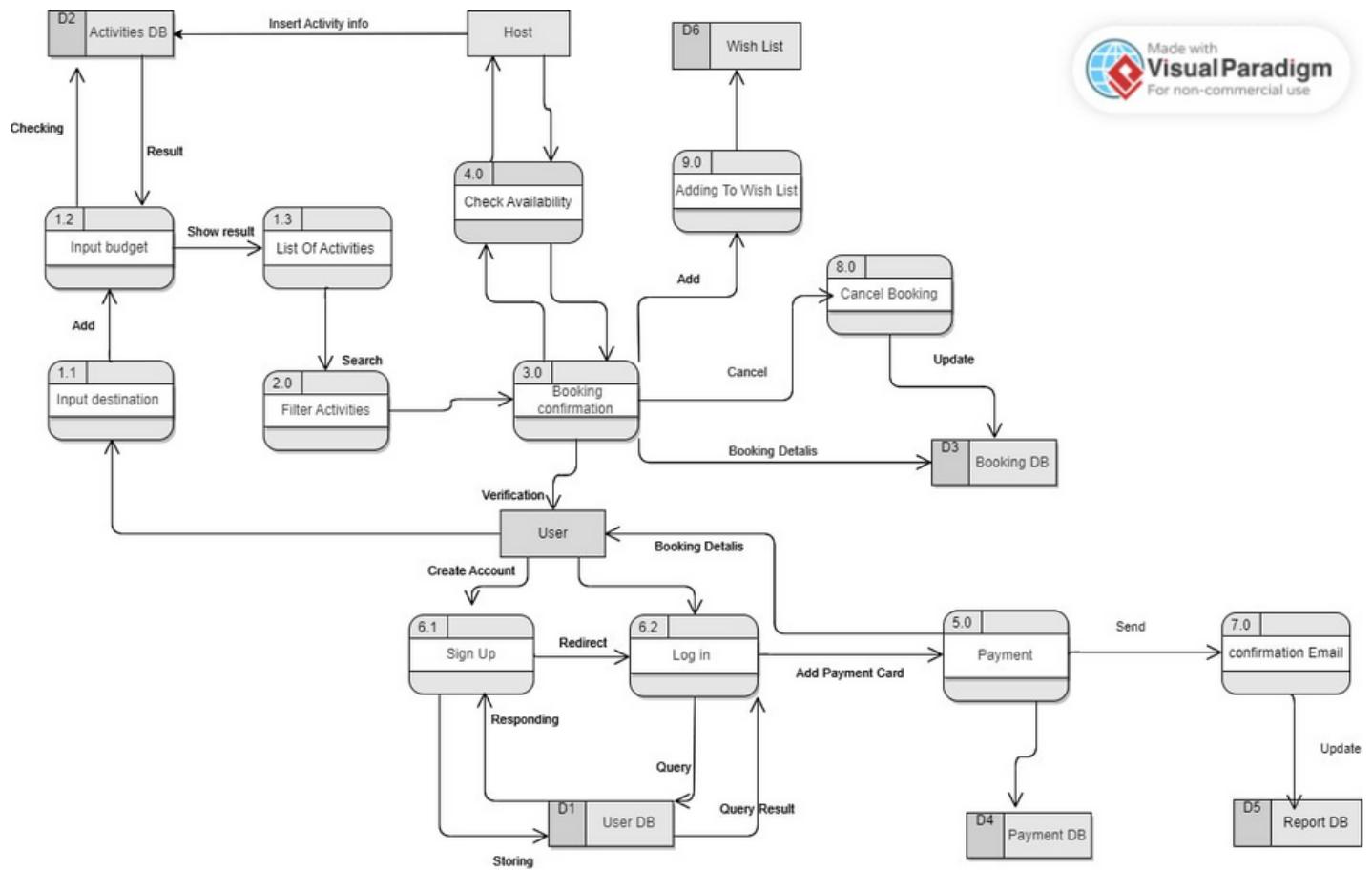
-Level 0-



4. DATA DESIGN

4.3. DATA-FLOW DIAGRAM (DFD)

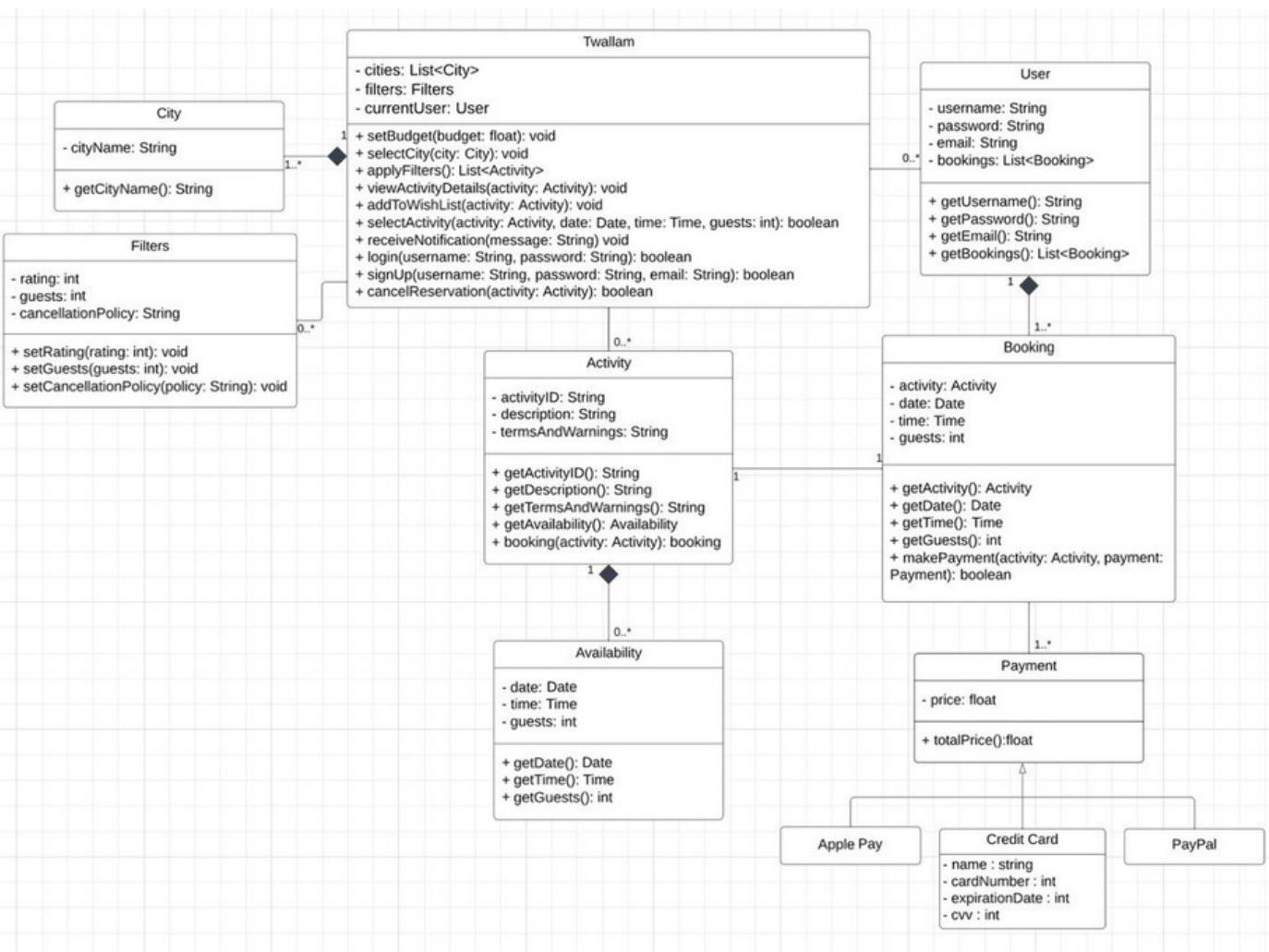
-Level 1-



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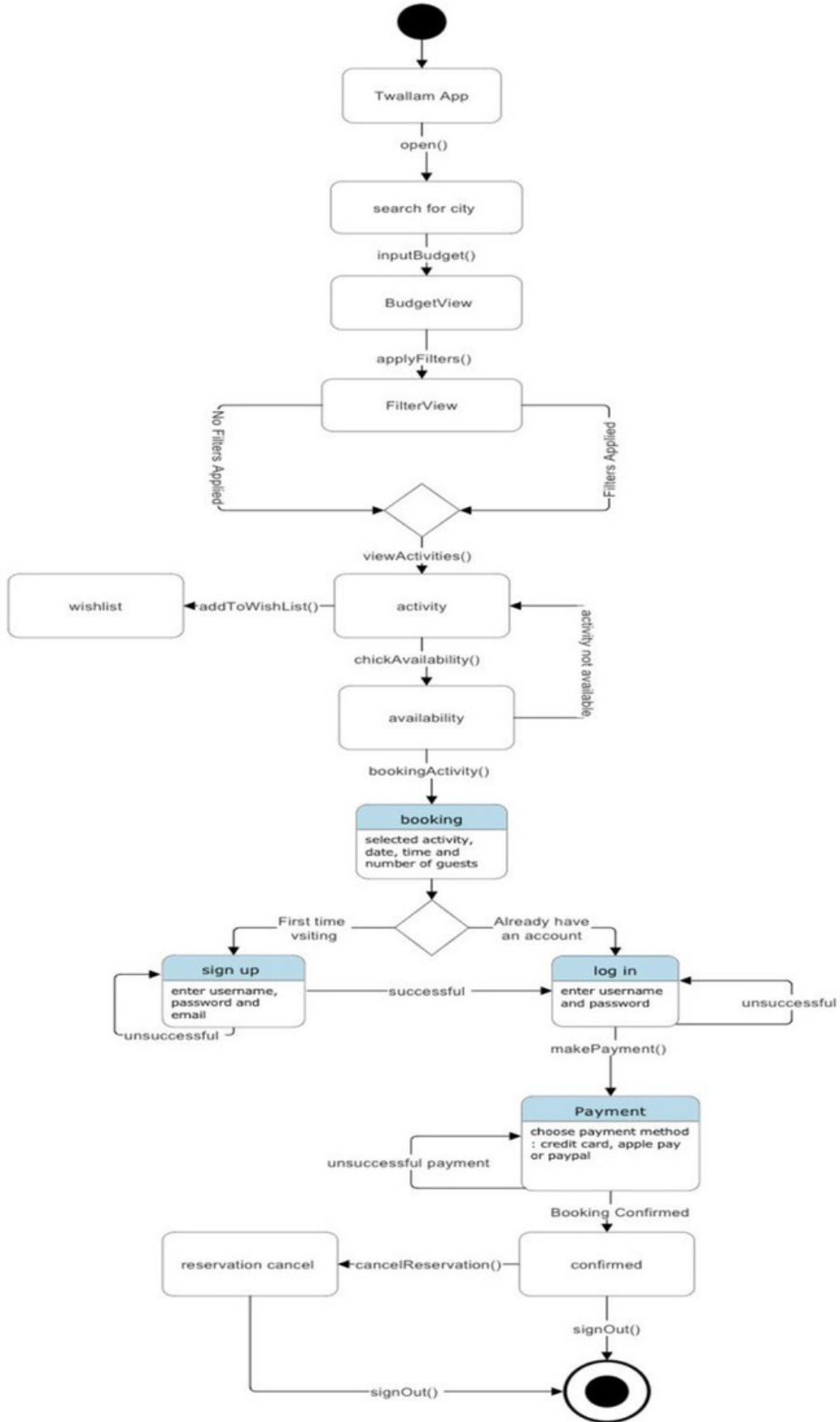
5. DESIGN DETAILS

5.1. CLASS DIAGRAM



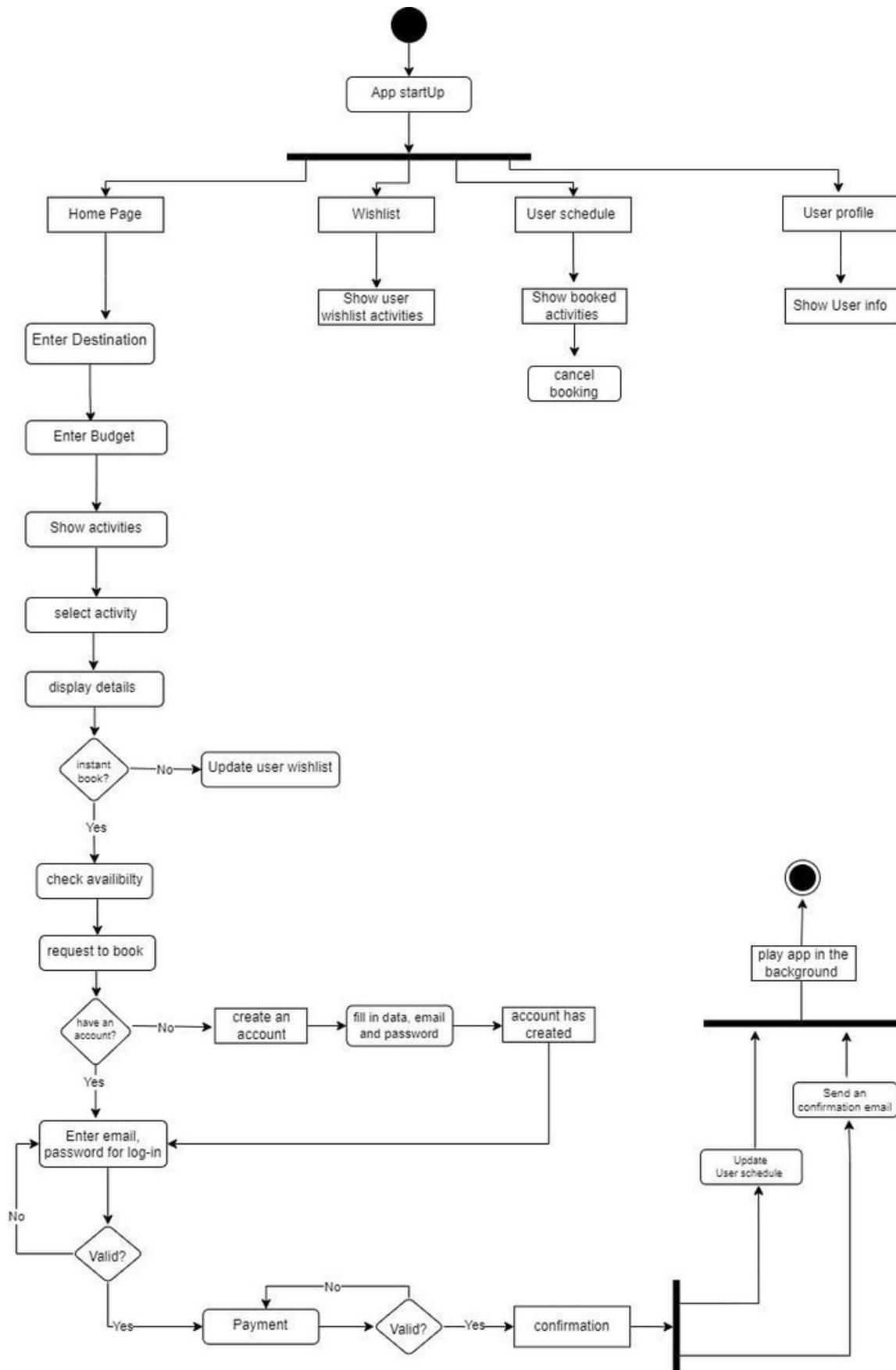
5. DESIGN DETAILS

5.2. STATE DIAGRAM



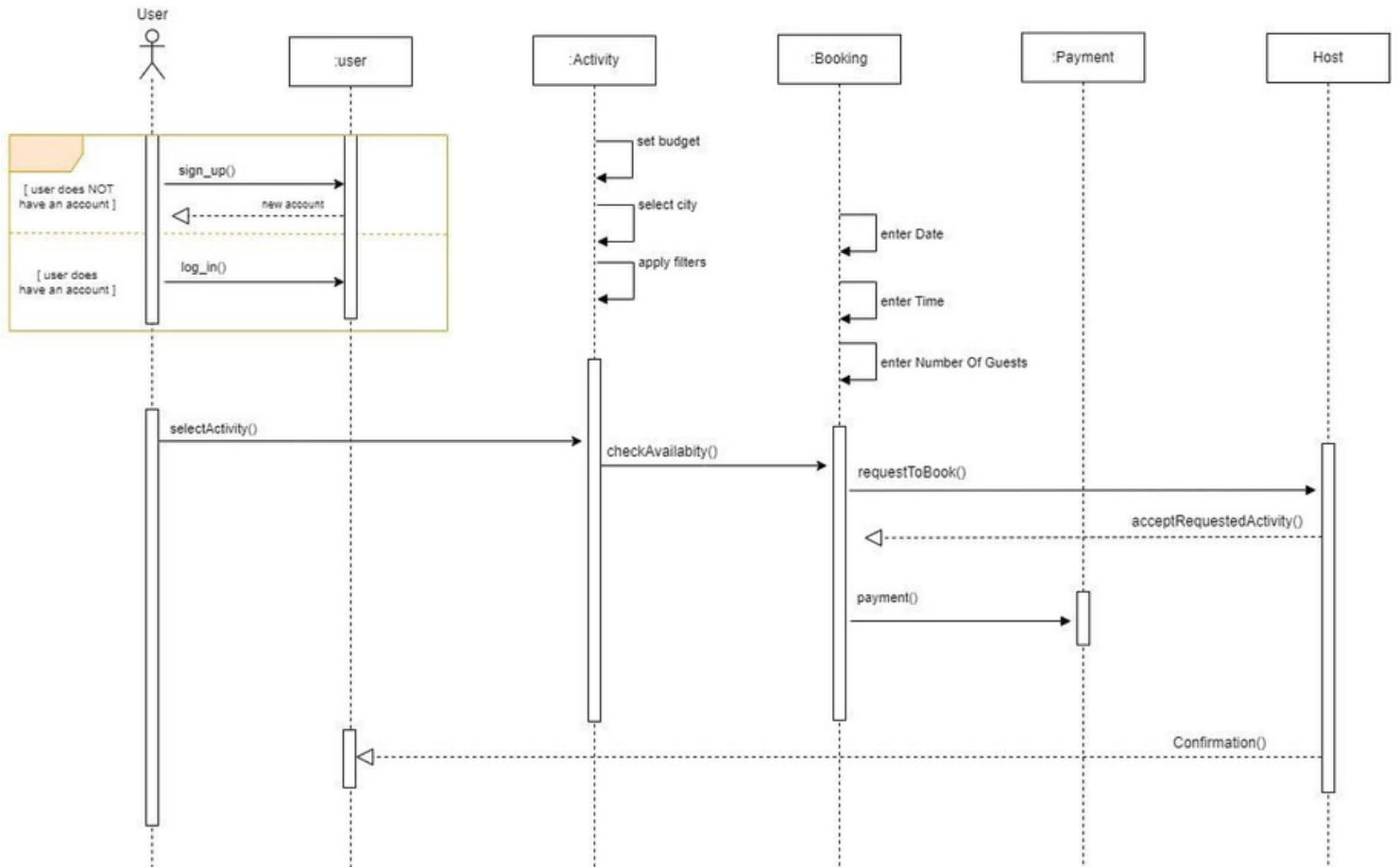
5. DESIGN DETAILS

5.3. ACTIVITY DIAGRAM



5. DESIGN DETAILS

5.4. SEQUENCE DIAGRAM



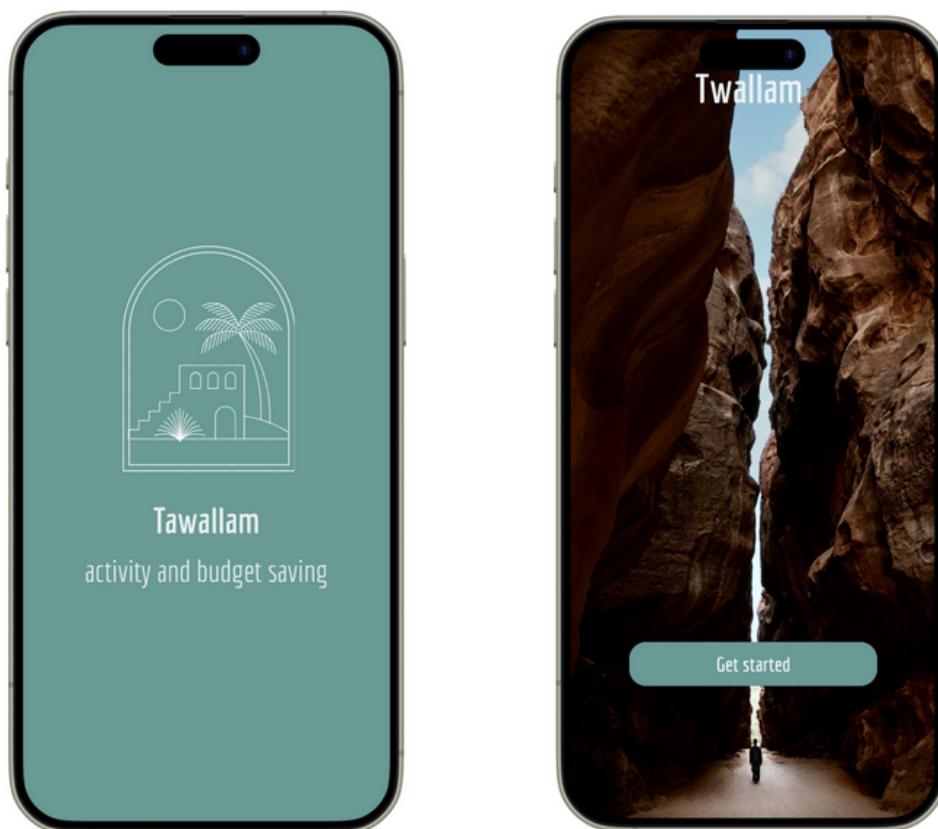
6. HUMAN INTERFACE DESIGN

6.1. OVERVIEW OF THE USER INTERFACE

User-friendly interface of “twallam” software made the searching and booking any activity easier. With just the preferred destination and budget limit entering, the software provides an extensive selection of activities, user can select the category of the activity is looking for and more filtering makes user decide faster. Checking availability by entering the date and number of guests if it's available, user can confirm booking of chosen activity by logging in (signing up for new users), pay for it using one of payment methods. Through the reservation page user can review their reservations and cancel it (if possible). The software offers the option to add to the wish list as well.

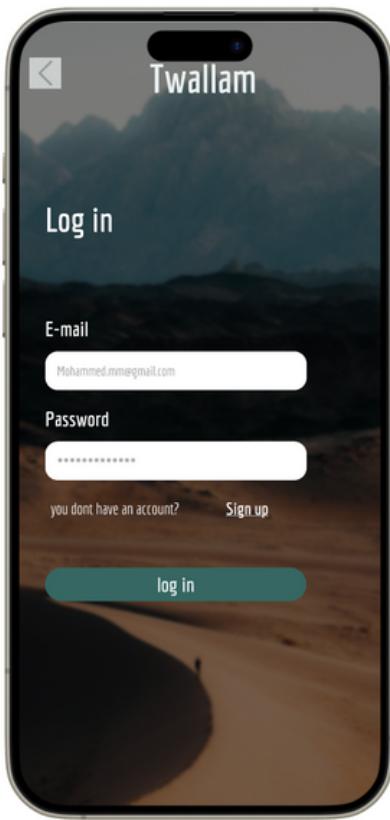
6.2. DETAIL DESIGN OF THE USER INTERFACE

Landing Page



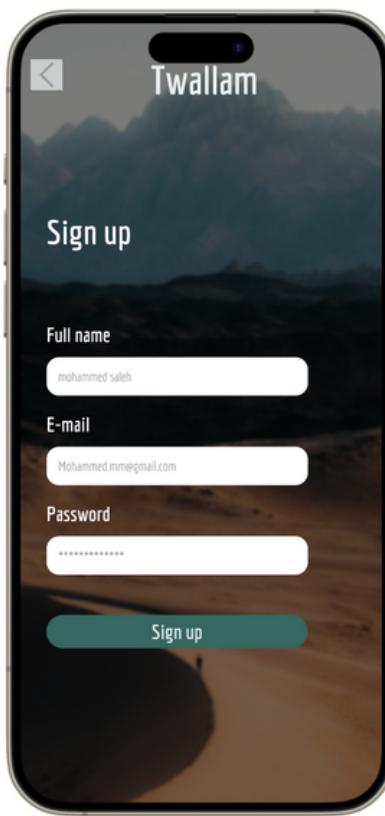
6. HUMAN INTERFACE DESIGN

Log in



On the sign-in page, fill in your email and password. If you don't have an account, simply navigate to the sign-up page.

Sign up



On the sign-up page, provide your full name, email, and create a password to create your account.

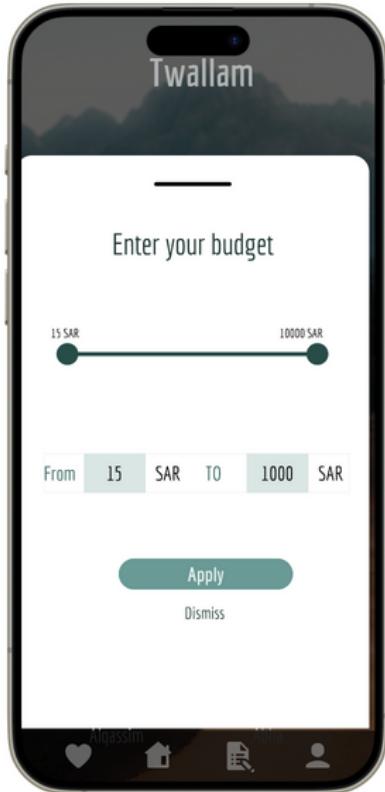
City page



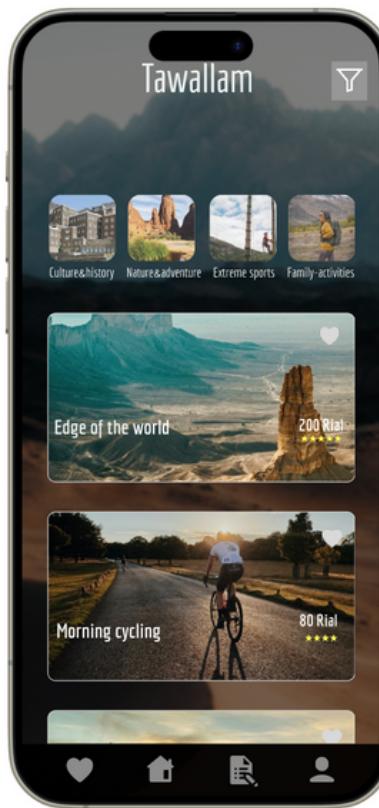
On the city page, you can find your desired location in three easy ways: either by typing and searching for the city, accessing your current location, or simply choosing from the list of cities provided on the page.

6. HUMAN INTERFACE DESIGN

Input the Budget

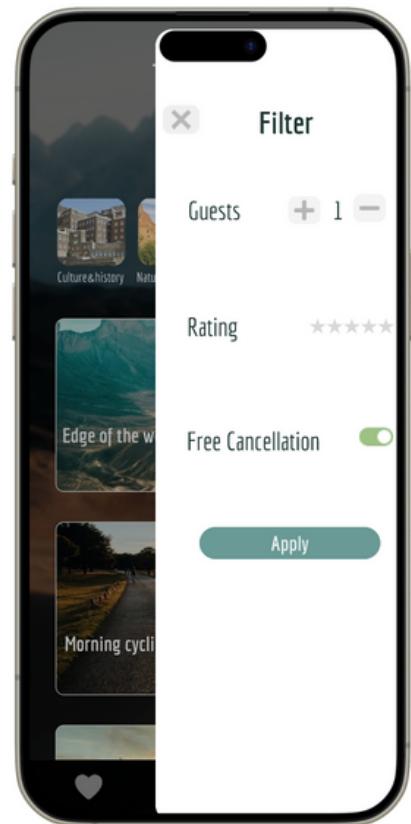


activities Page



Once you've chosen your city, you have the option to either input your budget or dismiss it to view default activities.

Filter



Filter options are available based on the number of guests ,the cancellation flexibility and rating of activities.

On the activity page, activities are displayed according to your budget. You can further refine your options by selecting the type of activity or using the filter to narrow down the choices.

6. HUMAN INTERFACE DESIGN

Selected activity

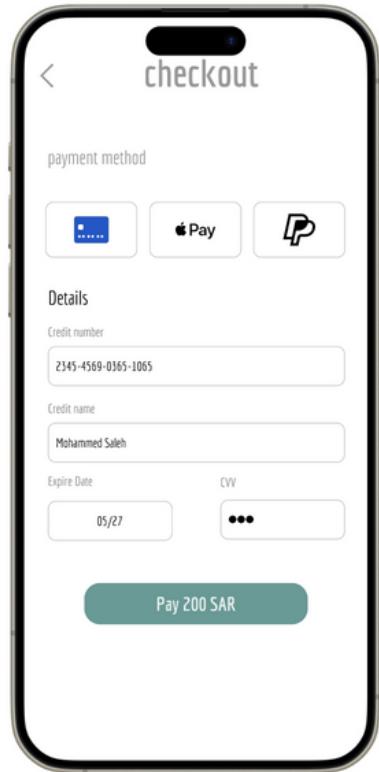


activities Page



Clicking "Book Now" will take you to the checkout page, where you can review your selected activity, confirm details, and proceed with the booking process.

Checkout



select your preferred payment method and provide the necessary information to complete the booking process.

6. HUMAN INTERFACE DESIGN

Wishlist Page

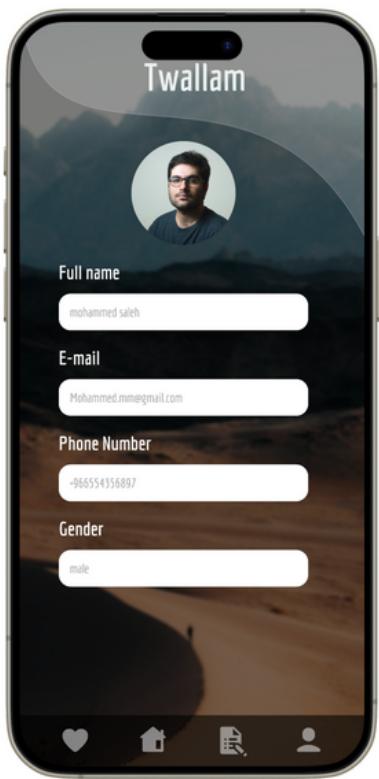


Reservation Page



The Reservation Page displays all your booked activities for easy reference. You can view the details of each reservation and, if needed, there's an option to cancel a booking directly from this page.

User Page



Your full name, email, profile picture, phone number, and gender details are available on the User Page.

Contributions

Introduction

Dana AL-Duayji
Emtenan AL-Fozan

System Overview

Hagar AL-Amirini
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System Architecture and Components

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Dana AL-Nahel (3.3 3.4)

Data Design

Jumanah AL-Matrood (4.1 4.2)
Huda AL-Mutairi (4.3)

Design Details

Kadi AL-Ali (5.1 5.2)
Shrooq AL-Qaied (5.3 5.4)

Human Interface Design

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Documentation

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