GOJO

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CHAPTER ONE : PROJECT INITIATION

1.1 Project Overview

GoJo is a web and mobile application designed to provide a seamless and immersive tourism experience in Jordan. It helps visitors explore historical sites, cultural attractions, and local businesses while enhancing their overall travel experience. The application offers personalized travel tips, easy trip planning, and real-time tourist support using advanced AI, multimedia, and smart tools.

1.2 Problem Definition

1.2.1 Issues

- Lack of personalized travel planning tailored to individual tourist preferences.

- Inefficient visibility and promotion of local businesses and cultural events.

- Reliance on scattered and unintegrated sources for maps, tips, and site information.

1.2.2 Objectives

- Implement an AI-powered itinerary generator that customizes travel plans based on user interests and trip duration.

- Integrate smart recommendations for nearby restaurants, accommodations, and events.

- Offer centralized offline access to maps, guides, and site details for enhanced usability.

1.2.3 Requirements

- provide user authentication for secure access.
- provide maps with the ability to save offline maps.

- provide access to information about local events.

- provide access to nearby restaurants and hotels.

- allow users to save favorite restaurants, hotels, locations, and personalized plans.

- allow users to write reviews and provide feedback on restaurants, hotels, and tourist attractions.

- provide an itinerary planner based on user preferences and input data.

1.2.4 Constraints

- The system shall be constrained by availability.

- The system shall be limited by the storage capacity required for offline maps .

- The system shall be constrained usage limits of third-party APIs.

- The system shall be limited by the allocated budget and time for development.

- The system shall be constrained by internet connectivity for features requiring real-time updates.

1.2.5 Vision Document

Problem statement:

Tourists in Jordan face a fragmented and disjointed travel experience, lacking digital integration and connected tourism services, which makes it difficult for them to explore easily and enjoy their trip.

System capabilities:

- **Interactive multimedia guides:** text, images for cultural and historical sites.

- **Personalized AI itineraries:** tailored to interests and trip length.

- **Smart local recommendations:** restaurants, hotels, events, and authentic experiences.

- **Offline access:** maps available for international travelers.

Business benefits:

- **Tourism Growth:** Attract more tourists to Jordan with smart, personalized travel plans.

- **Local Economy Boost:** Recommend local businesses to users, supporting the community.

- **Cultural Preservation:** Introduce and engage tourists with Jordan's heritage and traditions through multimedia content.

- **Partnerships :** Opportunities to collaborate with airlines, hotels, travel agencies, and local vendors.

- **Enhanced Tourist Satisfaction:** Make travel easier and enjoyable, leading to positive feedback and business success.

1.3 Solution Alternatives Feasibility Study

1.3.1 Technical feasibility

With the use of technologies like Firebase and AWS, **GOJO** for Jordan is technically feasible and can support features like tailored itineraries. Frameworks like Flutter provide development for mobile platforms, while offline map functionality can be connected via services like Mapbox or Google Maps. We can effectively develop and maintain the platform with scalable infrastructure and easily accessible development tools, proving the technological viability of the project.

1.3.2 Operational Feasibility

The assistance of regional stakeholders is crucial to the **GOJO's** success. This includes companies that will offer precise, current information about the nation's historical landmarks, tourist

destinations, dining options, and events, as well as content producers and tour guides. The success

of the platform will depend on solid alliances with nearby lodging facilities, dining establishments,

and travel organizations. A committed staff will also be required to manage customer service and

offer real-time assistance to travelers on their travels. For operations to run smoothly, proper staff

training and frequent system updates are also essential. These operational requirements are easily

met by Jordan's growing tourism industry and strong digital infrastructure, and there is a definite

chance to work with regional companies and associations.

1.3.3 Economic Feasibility

Development cost:

1. Hardware and Software

Table 1:Hardware and Software Required

Hardware & Software	Quantity	Basis of Cost(JD)	Cost(JD)	Comments
Workstations	5	500 per unit	2500	Standard mid-range developer laptops required for Flutter and Android/iOS emulation.
Testing Smartphones	2	500 per unit	1000	1 unit each for dedicated Android and iOS testing to ensure cross-platform compatibility.
Cloud Service Pre-payment	1	/	800	Allocates budget for initial usage fees covering Firebase, Google Maps API, and Dialogflow.

Total Hardware & Software Cost	4300

2. Personal cost

Table 2:The Personal Cost

Role	Members	Cost (JD)	Cost per Member (JD)
Developer	3	6000	2000
UI/UX Designer	1	1000	1000
Database Specialist	1	1500	1500
Travel Tech Consultant	1	2000	2000
Project Manager	1	2500	2500
Total Personal Cost	7	13000	

Total development cost:17300 JD

3. **Operating cost:**

Table 3: The Operating Cost

Expense	Yearly Cost (JD)	Comments
Maintenance	3600	System Updates & API Licensing estimated at 300 JD/month
Custom Support	10800	Customer Service Personnel at a rate of 900 JD/month
Hosting	500	Base Cloud Infrastructure

TotalOperating Cost	14,900 JD

Benefits:

1. Tangible Benefits

Table 4:The Tangible Benefits

Tangible Benefit	Annual Savings (JD)	Comments
Increase Tourism revenue	20000	Assumes that 4,000 tourists use the app and are influenced to spend an average of 5JD extra on recommended activities or lesser-known sites.
Local Business support	4000	Represents estimated annual revenue from 100 local businesses paying a modest annual listing or promotion fee of 40 JD.
Less money spent on Physical Guides	3000	Estimated saving from replacing 1500 physical maps and guides with the digital, multimedia guide, at an estimated printing/distribution cost of 2JD per guide.
Total Tangible Benefits	27000	

2. Intangible Benefits

Table 5:The Intangible Benefits

Intangible Benefit
Increase tourist satisfaction
Improved the image for Jordan
Introducing and supporting culture

	A	B	C	D	E	F	G	H	I	J
	Year	Cost JD	Bemefits	Accumulated Co	Accumulated Bene	Discount Fac	Discounted Co	Discounted Benefits JD		
	0	17300	0	17300	0	1	17300	0		
	1	14900	27000	32200	27000	0.892857143	13303.57143	24107.14286		
	2	14900	27000	47100	54000	0.797193878	11878.18878	21524.23469		
	3	14900	27000	62000	81000	0.711780248	10605.52569	19218.06669		
	4	14900	27000	76900	108000	0.635518078	9469.219368	17158.98812		
	5	14900	27000	91800	135000	0.567426856	8454.66015	15320.5251		
									Total Discounted Cost	71011
									Total Discounted Bene	97329
									NPV	26318
									ROI	47.059
									Payback Period	2

Figure 1:Cost and Benefits Analysis

1.3.4 Schedule Feasibility

Table 6:The Schedule Feasibility

Sprint	Task Number	Sprint Goal / Description	Duration (weeks)	Dependency
Sprint 1	S1	Project Foundation (setup, feasibility, backlog creation)	1	-
Sprint 2	S2	Core UX & Market Validation	1	Sprint 1
Sprint 3	S3	Authentication & User Profile	2	Sprint 2
Sprint 4	S4	Map Integration (navigation, pins, permissions)	2	Sprint 3
Sprint 5	S5	Destinations Discovery (listing and details)	2	Sprint 4
Sprint 6	S6	AI Trip Planning (AI logic, user input, itinerary output)	2	Sprint 5
Sprint 7	S7	Booking, Reviews & NFR Enhancements	2	Sprint 6
Sprint 8	S8	Full System QA (integration and acceptance testing)	2	Sprint 7
Sprint 9	S9	App Launch (release build, documentation, publishing)	2	Sprint 8

1.3.5 Legal Feasibility

To make sure **GOJO** is legal and safe to use, it must follow the rules and laws in Jordan and other countries. This includes protecting users' personal information, especially if they are from other countries like those in Europe. If the platform collects personal details, it must handle them carefully and follow privacy laws.

Also, if **GOJO** uses services like hotel booking or maps from other companies, or shows cultural or historical content, it might need special permission or licenses. The platform's rules and agreements for users should clearly explain everyone's rights and responsibilities.

1.4 Recommended Solution and Expected Project Deliverables

Recommended Solution:

To address the challenges faced by tourists in navigating and experiencing Jordan's rich cultural heritage, we propose the development of a Smart Tourism Experience & Cultural Guide. This platform will be accessible via mobile application, offering users a seamless and intelligent travel companion. It combines modern technology with cultural immersion to support tourists from arrival to departure.

The system will:

- Offer AI-powered itinerary planning tailored to tourist preferences and trip duration.

- Recommend local attractions, restaurants, accommodations, and events using smart filters.

- This solution not only streamlines travel but also supports local economies by promoting businesses and cultural landmarks.

Expected projected deliverables:

- Mobile Platform with responsive design and accessible UI.

- AI-Based Recommendation Engine for itinerary and activity suggestions.

- Smart Recommendation Module for local dining, lodging, events, and experiences.

- Offline Maps and Content for use without internet connectivity.

- Local businesses Dashboard for content and recommendation management.

- Documentation for system maintenance and deployment.

- User Manual for tourist onboarding and feature explanation

1.5 Local and Global Impact of the Proposed Solution

Local Impact:

- **Tourism Revenue:** The app encourages tourists to explore lesser known destinations and supports local vendors, helping to distribute economic benefits more fairly across Jordan.

- **Promotes Cultural Heritage:** It educates tourists on Jordan's history and traditions, thereby reinforcing cultural appreciation and preservation.

- **Empowers Small Businesses:** Provides vital visibility to local restaurants, shops, artisans, and tour services through targeted smart recommendations

- **Improves Tourist Experience:** It helps reduce confusion and stress for tourists by offering personalized itineraries.

Global Impact:

- **Enhances Jordan's Global Image:** The platform positions Jordan as a smart, tourist-friendly country that leverages technology for cultural promotion.

- **Promotes Intercultural Exchange:** It makes it easier for tourists from diverse backgrounds to understand and connect with Jordanian traditions and local etiquette.

- **Scalable Tourism Model:** This technology solution is designed to be highly adaptable, allowing it to inspire or be adapted for use in other countries seeking to digitally transform their tourism sectors.

- **Sustainable Tourism Practices:** The app contributes to sustainability by suggesting off-the-beaten-path alternatives, reducing overcrowding at popular sites, and aiding environmental and cultural conservation.

CHAPTER TWO: PROJECT MANAGEMENT PLAN

2.1 Project Organization (Describes the team structure)

The team is organized in a hierarchical structure with a **Project Manager** overseeing the entire development process. Below the manager, the team is divided into the following roles: **Developers, UI/UX Designers, System Analysts, and QA/Testers**.

Project Team Structure

QA/Tester
Eman Tegoan

Project Manager
Sara Alkhrissat

System Analyst
Leena Majed
Sara Alkhrissat
Eman Tegoan

Developer
Leena Majed
Sara Alkhrissat
Eman Tegoan

UI/UX Designer
Leena Majed
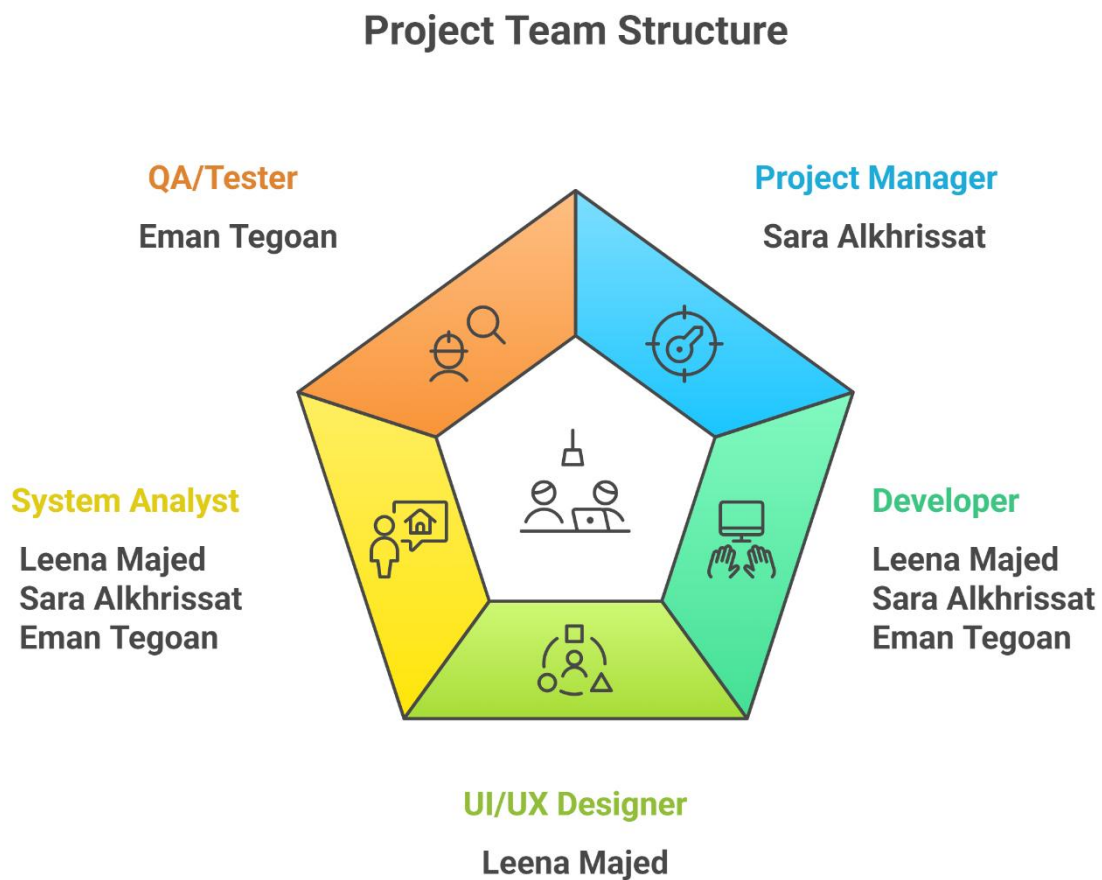
Figure 2:The Project Organization

2.2 Roles and Responsibilities (Details specific roles and responsibilities)
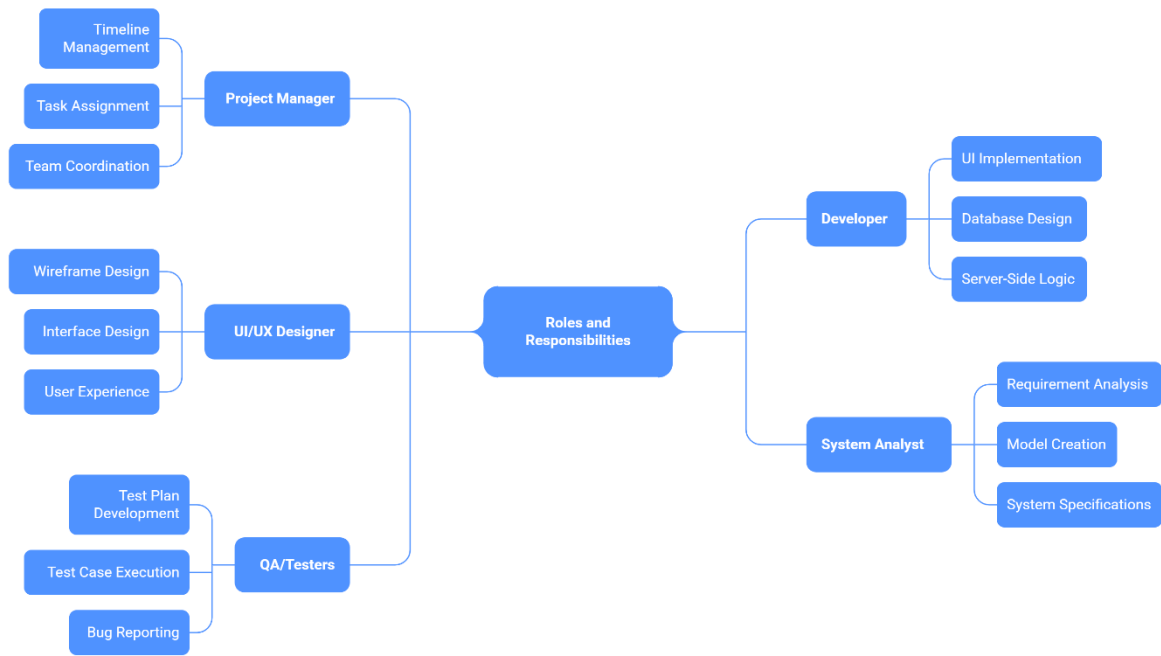
Figure 3:The Roles and Responsibilities

2.3 Software Process Model (Defines the process model to be used)

The team selected the Agile software process model for the development of GOJO. While the project's objectives were established early on, many components, particularly those involving AI functionality, user interaction, and map-based features, required adaptability and continuous refinement. Agile supports this need by enabling iterative development through short, structured sprints. This approach allows the team to test features early and make informed adjustments throughout the development cycle. By continuously evaluating progress at the end of each sprint,

the team ensures that the system evolves in line with user expectations and technological requirements.
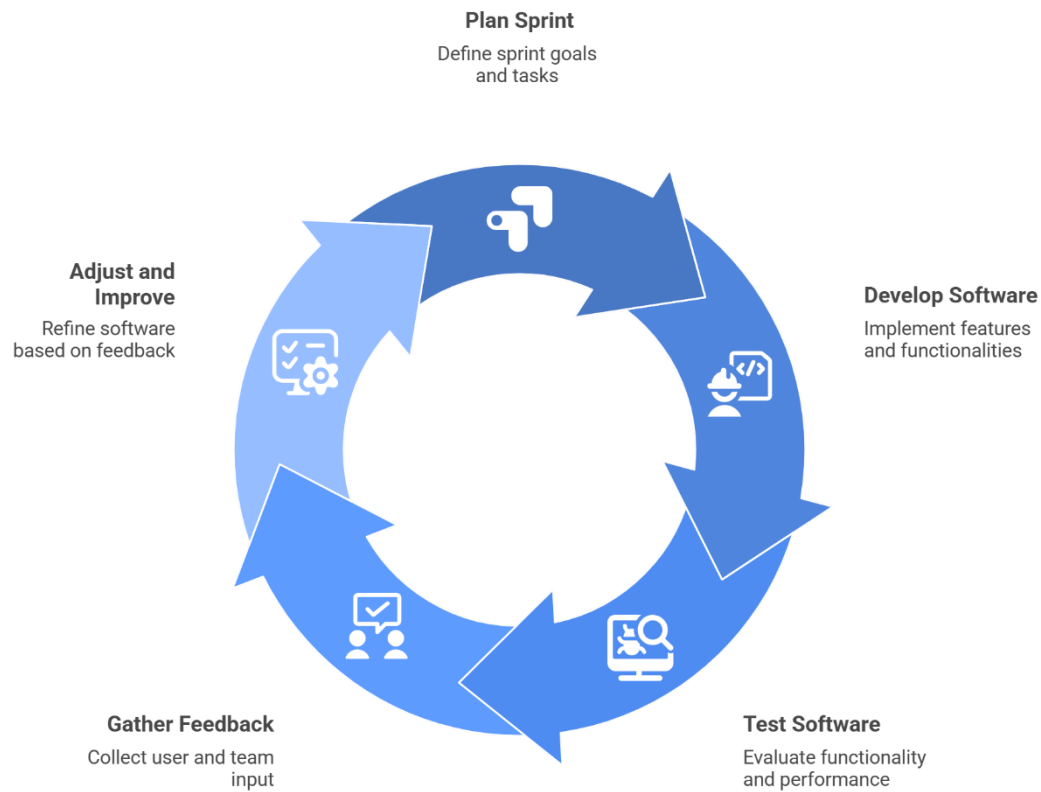
Figure 4:The Agile Software Process Model

2.4 Project Environment

Procedures:

- Weekly team meetings and mobile testing reviews.
- Task tracking via Trello.
- Git for version control.

Tools:

- Design: Figma (for mobile app UI)
- Development: Flutter (cross-platform mobile)
- Backend and DB: Firebase (Auth, Firestore, Storage)
- Maps and Navigation: Google Maps API

- Testing: Android Emulator, Firebase Test Lab

Hardware resources:

- Smartphones (Android and iOS) for testing (2 units)

- Developer laptops (5 units)

Software resources:

- Flutter SDK

- Android Studio

- Firebase Console

- Google Play Console (for deployment)

2.5 Project tasks

Table 7:The Project tasks

Sprint	User Story ID	User Story /Feature	Tasks	deliverables	Duration	Skills and resources	dependencies
Sprint 1 Project Setup and Feasibility	US1	Verify feasibility and plan development	**TS1.1:** Initial research **TS1.2:** Agile charter & backlog	Feasibility Summary, Initial Backlog, Review Notes	1 week	Research, analytical skills	None
Sprint 2 Market and Requirement Validation	US2	Validate users, competitors, and requirements	**TS2.1:** Market analysis **TS2.2:** Final feasibility, confirm tech	Updated Backlog, Market Report, Tech Stack	1 week	Communication, Analysis, documentation	Sprint 1
Sprint 3 Authentication Feature	US3	User login & profile	**TS3.1:** Login/sign up **TS3.2:** Profile **TS3.3:**	Authentication Module (Increment 1)	2 weeks	Flutter, Firebase	Sprint 2

			Firebase setup.				
Sprint 4 Map Foundation	US4	Map exploration	**TS4.1:** Map API **TS4.2:** Pins **TS4.3:** Permissions	Functional Map	2 weeks	Flutter, Maps API	Sprint 3
Sprint 5 Destinations Discovery	US5	Browse destinations	**TS5.1:** List UI **TS5.2:** Details page **TS5.3:** Firebase content	Discovery Feature	2 weeks	Flutter, Firebase	Sprint 4
Sprint 6 AI Itinerary Planner	US6	AI-generated itineraries	**TS6.1:** AI logic **TS6.2:** Input **TS6.3:** Itinerary output	AI Planner	2 weeks	Flutter, Firebase, Dialogflow	Sprint 5

Sprint 7 Reviews & NFRs	US7	Reviews	**TS7.1:** Reviews **TS7.2:** NFR optimization	Reviews and NFR Compliance	2 weeks	Flutter, Firebase, QA	Sprint 6
Sprint 8 Testing & QA	US8	System verification	**TS8.1:** Integration tests **TS8.2:** UAT & performance tests	Test Reports, Fixed Bugs	1 week	Testing, QA	Sprint 7
Sprint 9 Deployment & Release	US9	Final delivery	**TS9.1:** Release build **TS9.2:** Documentation **TS9.3:** Publish	Published GOJO App, Documentation	1 week	Development operations, documentation	Sprint 8

2.6 Project Schedule

2.6.1 Gantt chart
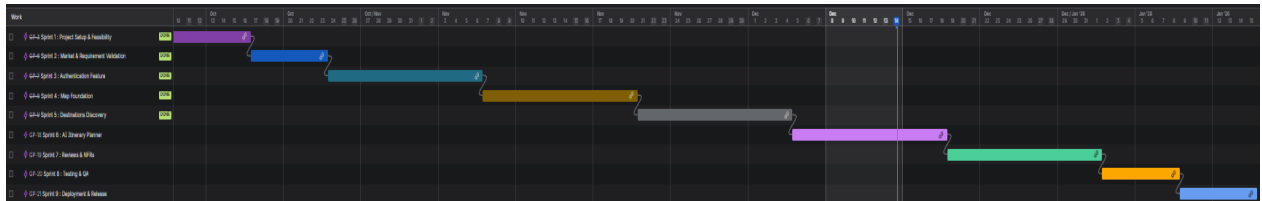
Figure 5:Gantt Chart

2.6.2 Pert Diagram

The GOJO project consists of multiple interdependent tasks with varying durations. Using a PERT diagram, the project timeline and critical path were analyzed. The critical path is identified as:

Sprint 1 → Sprint 2 → Sprint 3 → Sprint 4→ Sprint 5→ Sprint 6→ Sprint 7→ Sprint 8→ Sprint 9 with a total duration of 98 days. Any delay in the tasks along the critical path will delay the overall project completion.

Key insights:

• Tasks outside the critical path have some flexibility (slack time).

 • Monitoring the critical path tasks is essential for ensuring on-time project delivery.

Figure 6:Pert Diagram

2.7 Assigning Team Members to Tasks

Table 8: The Tasks Assigned to Team Members

Sprint ID	Sprint name	Duration (weeks)	Assigned to
S1	Project Foundation (setup, feasibility, backlog creation)	1	All team members
S2	Core UX & Market Validation	1	All team members
S3	Authentication & User Profile	2	All team members
S4	Map Integration (navigation, pins, permissions)	2	All team members
S5	Destinations Discovery (listing and details)	2	All team members
S6	AI Trip Planning (AI logic, user input, itinerary output)	2	All team members
S7	Booking, Reviews & NFR Enhancements	2	All team members
S8	Full System QA (integration and acceptance testing)	2	All team members
S9	App Launch (release build, documentation, publishing)	2	All team members

2.8 Monitoring and Controlling Mechanisms

Table 9:EVM Analysis

At the end of	Week 2	Week 4	Week 6	Week 8
Stage	Stage 1 – Initiation & Research	Stage 2 – Requirements & Design	Stage 3 – Development	Stage 4 – Testing & Deployment
Estimated cost	1380 JD	4830 JD	8280 JD	2810 JD
Cumulative estimate	1380 JD	6210 JD	14490 JD	17300 JD
Estimated duration	2 weeks	2 weeks	2 weeks	2 weeks
Stage completed	100%	90%	0%	0%
Actual cost of stage to date	1380 JD	4100 JD	Not yet begun	Not yet begun
Cumulative cost of project to date	1380 JD	5480 JD	Not yet begun	Not yet begun

Table 10:Calculations for the EVM

Performance (P)	**47.5%**
Actual Cost (AC)	5480 JD
Planned Value (PV)	6210 JD
Earned Value (EV) $=PV \times P$	5727 JD
Cost Variance (CV) $=EV - AC$	247 JD
Schedule Variance (SV) $=EV - PV$	−483 JD
Cost Performance Index (CPI) $=EV \div AC$	1.045
Schedule Performance Index (SPI) $=EV \div PV$	0.922
Estimate to Complete (ETC) $=(BAC - EV) \div CPI$	11080 JD
Estimate at Completion (EAC) $=AC + ETC$	16560 JD

2.9 Risk Analysis

Analyzing Potential Project Delays in GOJO Project

Technical		Processes	
Software Issues		Inefficient Workflows	
		Poor Communication	Project Delays
Staff Shortage		Regulatory Issues	
Lack of Training		Market Changes	
Human Resources		External Factors	

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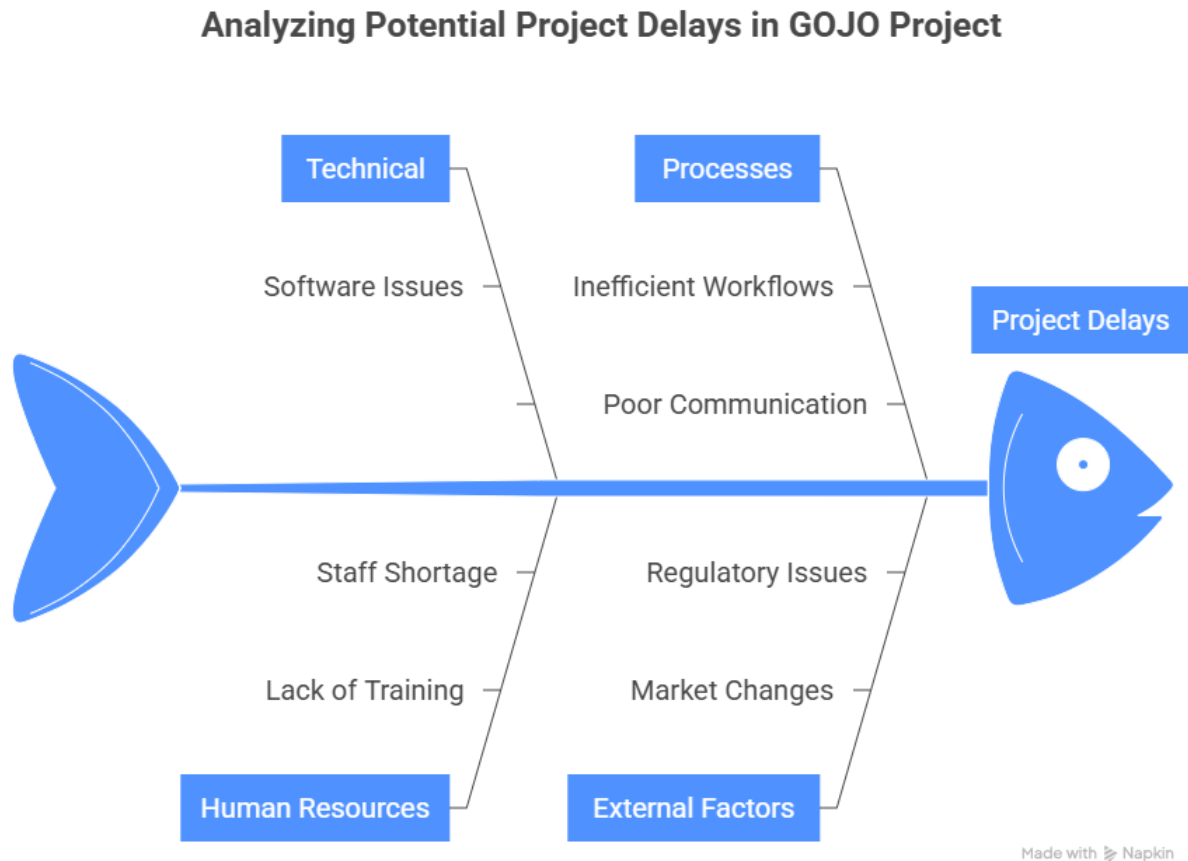
Figure 7:Fishbone diagram - Risk Analysis

2.10 Communication Plan

Weekly Meetings: The team meets on Zoom for 1 hour each week to review progress, coordinate tasks, and address any blockers. All core members attend.

Daily Check-ins: Team members provide brief updates on WhatsApp by 7 PM, noting completed tasks, upcoming work, and issues.

Collaborative Tools: Documents, requirements, and deliverables are shared and updated on Google Drive and Docs for transparency and version control.

Issue Escalation: Urgent issues can be raised on WhatsApp for quick resolution outside scheduled meetings.

CHAPTER THREE: RELATED EXISTING SYSTEMS

3.1 Existing Systems versus Proposed System

1. **Google Maps (Map/Navigation App)**

This app specializes in global mapping, routing, and location data. It is excellent for basic directions and map reliability but suffers from a **lack of integration** with tourism-specific cultural content and no capability for personalized itinerary planning.

2. **Tripadvisor**

This platform serves as a large database of global points of interest, hotels, and user reviews. While they offer rich content and community feedback, they rely **on scattered and unintegrated sources.**

3. **Tashat(Local tour guide)**

As a local Jordanian app, Tashat would excel at providing localized content and supporting specific local businesses. However, similar to other guides, it typically focuses on static listings and often fails to provide the dynamic, **AI-driven trip planning** required to solve the fragmented travel experience problem.

4. **Urduna Jannah (وزارة السياحة ـ أردننا جنة)**

A national initiative by the Ministry of Tourism that focuses on making domestic travel affordable through subsidized transport and tour packages. While it is unbeatable in price, it lacks flexibility, as users must choose from **pre-set schedules rather than creating their own customized trips.**

Table 11:Existing Systems versus Proposed System

Features	Google Maps	Tripadvisor	Tashat	Urdna Janna	GOJO
AI-Powered Personalized Itinerary	None, requires manual search.	Generic suggestions, not AI-personalized.	Static recommen dations based on area.	Preset packages, no individual customiza tion.	Full AI-powered custom planning.
Local Business Support/Pro motion	Often misses small local vendors.	Heavy on high-review commercial spots.	Focuses on local hidden gems.	Supports registered partners only.	Direct support for small local vendors.
Subsidized Trips/Bookin g	None	Third party booking only	Independe nt booking	Over 50% subsidy on specific tours.	None (Focus on planning and info).
Offline Map Access	Robust area downloads.	Requires internet for updates.	Integrated map features.	Limited digital	Centralized offline maps

				offline support.	
Multimedia Content	Basic photos/videos.	User-uploaded media.	Brief site info and photos.	Static official descriptions.	None (Focus on planning and info).
User Reviews/Feedback	Global user base.	Massive review database.	Limited community feedback.	Official complaints/feedback only.	Community reviews & feedback.

GOJO's architecture is specifically designed to solve the "fragmented and disjointed travel experience" currently faced by tourists in Jordan. Although GOJO has skipped multimedia content and chatbots, this is a strategic choice to focus entirely on its most significant competitive differentiator: the AI-Powered Itinerary Generator. By prioritizing data accuracy and smart logic over heavy media files, the application remains lightweight, meeting the storage capacity constraints associated with offline map usage. Tourists will choose GOJO because it bridges the gap between the rigid, pre-planned packages of Urduna Jannah and the unintegrated data of Google Maps. It offers the only platform where a visitor can enter specific interests and receive a fully personalized travel companion that supports small local vendors and operates seamlessly without internet connectivity.

CHAPTER FOUR: SOFTWAVE REQUIREMENT SPECIFICATION

4.1 System Stakeholders and Requirements Sources

4.1.1 System Stakeholders:

The GOJO system involves multiple stakeholders who have direct or indirect interest in the system's success. Their needs and expectations shape the system requirements.

- Tourists (Local and International Users)

  End users of the application who rely on GOJO for trip planning, personalized recommendations, and offline access to tourism information.

- Local Businesses and Tourism Points of Interest (POIs)

  All locations and experiences that tourists may visit during their trip, including cultural and natural sites, restaurants, coffee shops, accommodations, local vendors, and individual service providers. These POIs gain visibility through GOJO's recommendation system and user interaction.

- Ministry of Tourism and Antiquities (Jordan)

  Supports the promotion of tourism, cultural heritage, and sustainable travel practices across the country.

- Project Development Team

  Includes developers, designers, analysts, and testers responsible for implementing, maintaining, and improving the system.

- Project Manager

  Oversees planning, execution, scheduling, and delivery of the system to ensure it meets objectives.

- Third-Party Service Providers

   External AI services that support system functionality by enabling smart

   recommendations and itinerary generation.

- Future Partners

   Airlines, travel agencies, and tour operators that may integrate with GOJO in later phases

   to enhance tourism services and user experience.

4.1.2 Requirements Sources

The system requirements were gathered from the following sources:

- Interview with tour guide.

- Market analysis of existing tourism applications (Google Maps, Tripadvisor, Tashat,

   Urduna Jannah).

- Project feasibility and vision documents.

- Stakeholder discussions and brainstorming sessions.

   Analysis of current tourism trends and evaluation of digital travel platforms to identify

opportunities, best practices, and gaps in the market.

4.2 Information Gathering Techniques

4.2.1 Interviews

Interviewer: Thank you for joining us today. Could you please introduce yourself and briefly

describe your experience as a tourist guide in Jordan?

Tourist Guide: My name is Abdallah Baker, and I have been working as a tourist guide in Jordan

for more than 15 years. I have guided tourists across major destinations such as Petra, Wadi Rum,

Jerash, and the Dead Sea. Over the years, I've worked with visitors from many countries and with

very different travel interests.

Interviewer: One of GOJO's core functional requirements is AI-based personalized itinerary planning. From your experience, how important is personalization for tourists visiting Jordan?

Abdallah Baker: Personalization is extremely important. Tourists are not the same , some are interested mainly in history, others in culture, food, religion, or nature. A fixed itinerary often fails to satisfy everyone. I've had groups where one traveler wanted archaeological sites while another preferred local cultural experiences. A system that generates itineraries based on user interests, budget, and trip duration would solve many of these issues.

Interviewer: Another important requirement is offline map access . How critical is this feature for tourists?

Abdallah Baker: This feature is essential. Many areas in Jordan, such as Wadi Rum or Dana, have weak or no internet coverage. Offline maps help tourists navigate safely without relying on mobile data.

Interviewer: GOJO also allows users to save locations, write reviews, and share itineraries. How do these features impact the tourism experience?

Abdallah Baker: Saving locations helps tourists organize their trips better, especially when visiting multiple cities. Reviews help other tourists make informed decisions, and they also encourage local businesses to improve service quality. Sharing itineraries is useful for group travel and planning ahead with family or friends.

Interviewer: Finally, how do you feel about integrating digital platforms like GOJO with traditional tourism services?

Abdallah Baker: I believe technology should support, not replace, human interaction. A platform like GOJO can enhance the tourist experience by providing guidance, safety, and planning tools,

while still allowing tourists to enjoy real cultural interactions. It can also help promote small local businesses and improve tourism sustainability in Jordan.

Interviewer: Thank you, Mr. Abdallah Baker. Your insights are extremely valuable and directly support the functional goals of GOJO.

Abdallah Baker: Thank you. I look forward to seeing GOJO contribute positively to tourism in Jordan.

4.2.2 Questionnaires

The purpose of this survey is to understand how tourists plan and experience trips in Jordan. It aims to identify their current methods for trip planning, the challenges they face with digital tools, their preferences for itineraries, and the features they value most in a tourism app. The insights will help guide the design of GoJo, ensuring it provides personalized itineraries, offline access, local recommendations, and practical travel support.

Table 12:The Questionnaire

Questions
How do you usually plan your trips in Jordan
How many different apps or websites do you typically use during your trip
How important is having a personalized itinerary based on your interests and trip duration
Do existing travel applications provide itineraries that match your personal preferences
Would you use an AI-based system that generates a customized itinerary for your trip
Have you experienced internet connectivity problems while traveling in Jordan

How useful would offline maps be during your trip
Do you prefer discovering local and family owned businesses over tourist focused places
Would you trust AI-generated recommendations if they include real user reviews
Would you use a feature that allows you to save favorite locations and itineraries
How useful is sharing your trip plan with friends or family
Rank the following features based on importance to you when using a tourism app 1. Personalized itinerary planning 2. Offline maps 3. Local restaurant and hotel recommendations 4. User reviews and ratings 5. Cultural tips and emergency information
How important is having cultural tips and etiquette information while traveling

Conclusion

The questionnaire shows that most tourists in Jordan use several apps and websites to plan their trips, which makes planning time consuming and confusing. Many users feel that current travel apps do not fully match their personal preferences, creating a need for better solutions.

Internet connectivity problems are common, which makes offline maps and saved content very important. Respondents also value features such as personalized itineraries, trusted reviews, saving favorite places, and sharing trip plans.

Overall, the results support the idea of GoJo as a single platform that simplifies trip planning by combining personalized itineraries, offline access, and reliable recommendations, improving the travel experience in Jordan.

See Appendix for more information.

4.2.3 Document Analysis

The purpose of document analysis for GOJO is to identify functional and non-functional requirements, gaps in existing tourism systems, legal constraints, and best practices by reviewing relevant tourism and technology documents related to Jordan and similar platforms.

Documents Reviewed

- **Jordan Ministry of Tourism Publications**

     Cultural heritage and site descriptions

     Tourist safety and emergency information

- **Existing Tourism Platforms Documentation**

     Google Maps (navigation and offline maps)

     Tripadvisor (reviews and ratings systems)

     Local tourism apps (Tashat)

- **Legal and Policy Documents**

     Data privacy and user data protection guidelines

     Third-party API usage policies (Google Maps, Firebase)

Key Findings

Table 13:The Problems Found in Document Analysis

The problem	Description
Fragmentation Problem	Existing systems provide maps, reviews, or bookings separately, forcing tourists to switch between multiple platforms.
Lack of Personalization	Most reviewed platforms do not generate itineraries based on individual interests, budget, and trip duration.
Offline Accessibility Is Critical	Official tourism documents emphasize poor connectivity in remote areas (like Wadi Rum), validating the need for offline maps.
Cultural Guidance Is Often Missing	Many guides focus on locations but ignore cultural etiquette, which can lead to uncomfortable tourist experiences.
Support for Local Businesses Is Limited	Small and family run businesses often lack visibility in global platforms.

Requirements Derived

Based on the analyzed documents, the following requirements were identified and incorporated into GOJO:

- ❖ AI-powered personalized itinerary generation

- ❖ Offline map and content availability

- ❖ Cultural guide and etiquette information

- ❖ Emergency contact access

- ❖ Local business registration and visibility

- ❖ Community reviews and feedback system

By observing tourists during their visits to different destinations in Jordan, it was found that most tourists rely on several separate applications, websites, and maps to plan their trips. This makes travel planning time consuming and sometimes confusing, especially for first time visitors. Tourists were also observed facing internet connectivity issues in remote and outdoor locations, which limits their ability to access maps, directions, and updated information.

In addition, tourists showed a strong interest in receiving personalized travel recommendations based on their interests and trip duration. However, existing platforms usually offer general suggestions rather than customized plans. It was also noticed that many local businesses and lesser known attractions lack proper digital visibility. These observations highlighted the importance of developing GOJO as a centralized system that provides offline access, AI-based itinerary planning, and stronger support for local businesses.
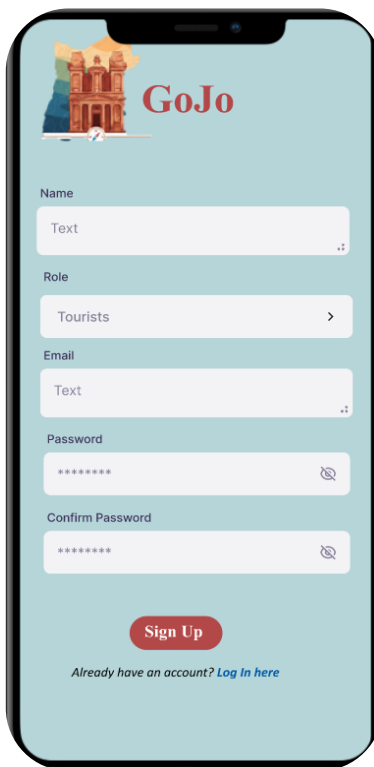
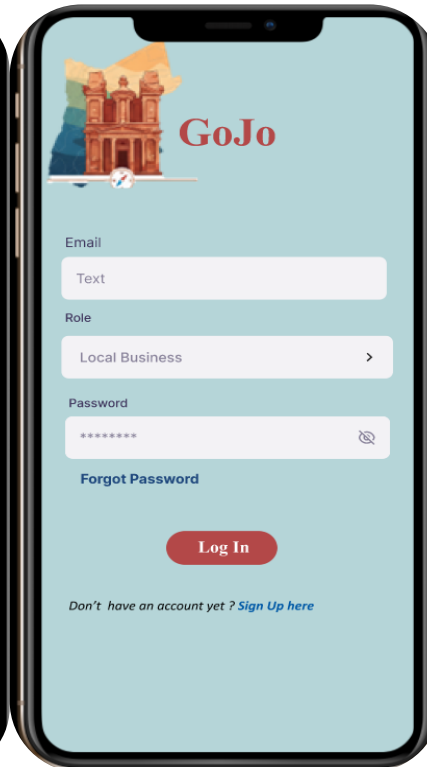*Figure 8:Sigh Up Prototype*

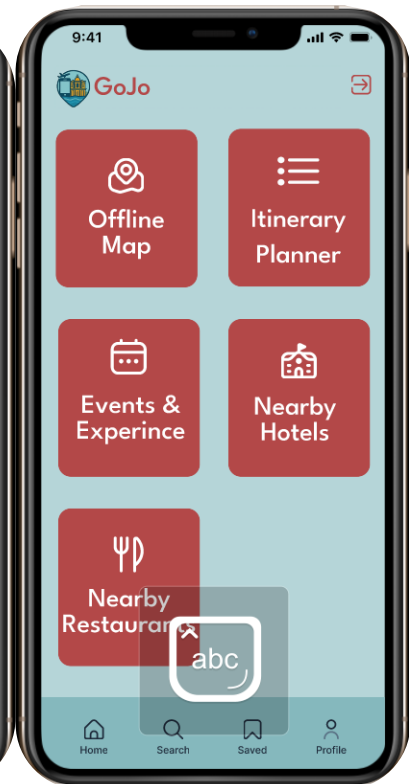*Figure 9:Sign In Prototype*

Figure 10:Home Prototype

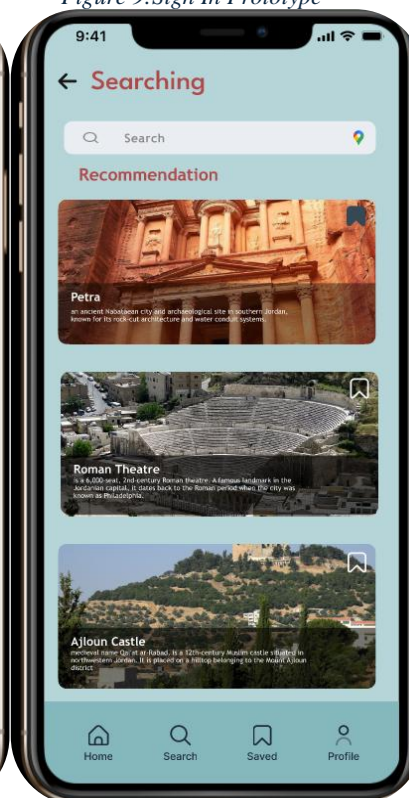

Figure 11:Offline Map Prototype

Figure 12:Search Prototype

4.3 User Requirements Definition

The user requirements definition describes the system requirements from the user's perspective, focusing on what the system must do to satisfy user needs.

4.3.1 Functional User Requirements

The GOJO system allows users to:

1. Register and log in securely.

2. Create and manage personal user profiles.

3. Receive AI-generated personalized itineraries based on user interests, trip duration, and preferred activities.

4. View details of destinations including description, location and reviews.

5. Save favorite points of interest and itineraries for future reference.

6. Write reviews and provide ratings for points of interest.

7. Access information about local events and cultural activities.

8. Regenerate itineraries based on updated preferences.

9. Use the application with limited or no internet connection for core features.

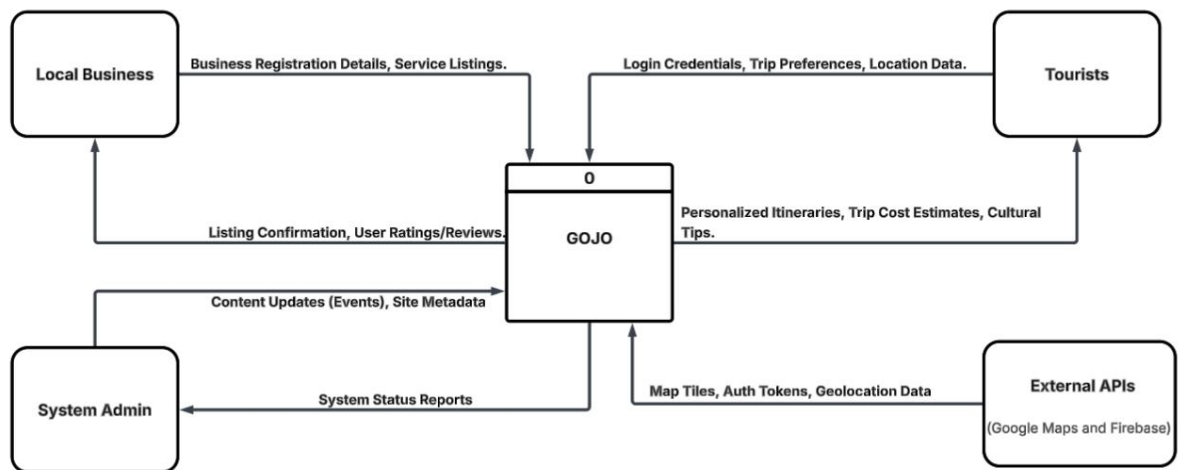## 4.4 Context and Use Case Diagrams
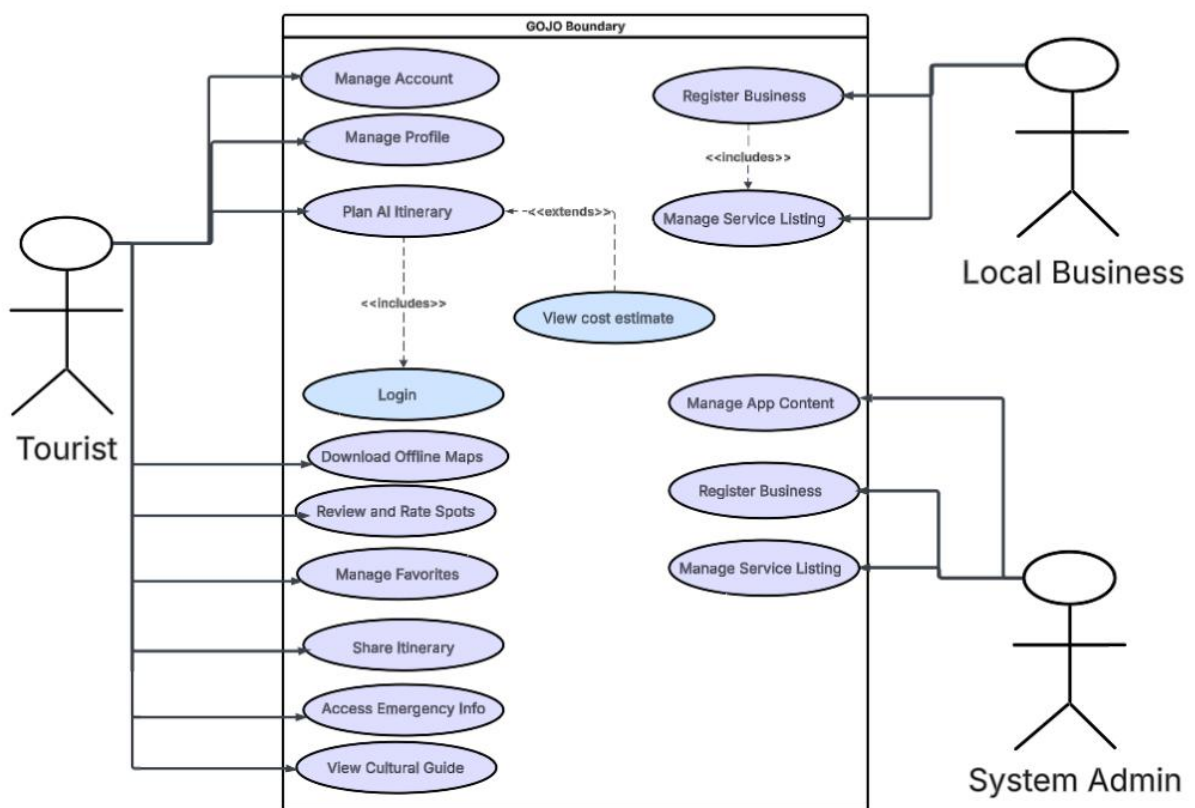

Figure 13: Context Diagram

Figure 14:Use Case Diagram

4.5 System Functional Requirement Specifications

Table 14:System Functional Requirement Specifications

SFR ID	Functional Requirement	Description
SFR 1	User Login	The system shall authenticate users using valid credentials and grant access to personalized features.
SFR 2	User Registration	The system shall allow tourists to create a new account using email and password .
SFR 3	User Logout	The system shall allow users to securely log out of the application.
SFR 4	Password Recovery	The system shall allow users to reset their password by sending a recovery link to their registered email.
SFR 5	User Profile Management	The system shall allow users to view and update their personal information and travel preferences.
SFR 6	Preference Based Personalization	The system shall store user preferences and use them to personalize itineraries.
SFR 7	AI Itinerary Generation	The system shall generate a customized travel itinerary based on user inputs such as interests, budget, and trip duration.
SFR 8	Itinerary Cost Estimation	The system shall calculate and display an estimated cost for the generated itinerary.
SFR 9	Map Navigation	The system shall allow users to browse tourist destinations with details such as location and description.

S0FR 10	Offline Map Download	The system shall allow users to download maps and destination data for offline access.
SFR 11	Saved Favorites	The system shall allow users to save favorite destinations, restaurants, and itineraries.
SFR 12	Reviews and Ratings	The system shall allow users to submit ratings and written reviews for destinations and services.
SFR 13	Review Display	The system shall display user reviews and ratings to other users.
SFR 14	Local Business Registration	The system shall allow local business owners to register and create a business profile.
SFR 15	Business Listing Management	The system shall allow business owners to update their services, location, and operating hours.
SFR 16	Emergency Information Access	The system shall provide users with quick access to emergency contacts and nearby help centers.
SFR 17	Cultural Guide Access	The system shall display cultural tips and etiquette guidelines related to Jordan.
SFR 18	Content Administration	The system shall allow administrators to add, update, or remove destinations, events, and guides.
SFR 19	Trip Sharing	The system shall allow users to share itineraries via external applications.
SFR 20	Data Synchronization	The system shall synchronize updated data across all users.
SFR 21	Secure Data Storage	The system shall securely store user and business data via Firestore.

4.6 Use case scenarios

Table 15:Manage Account Use Case Scenario

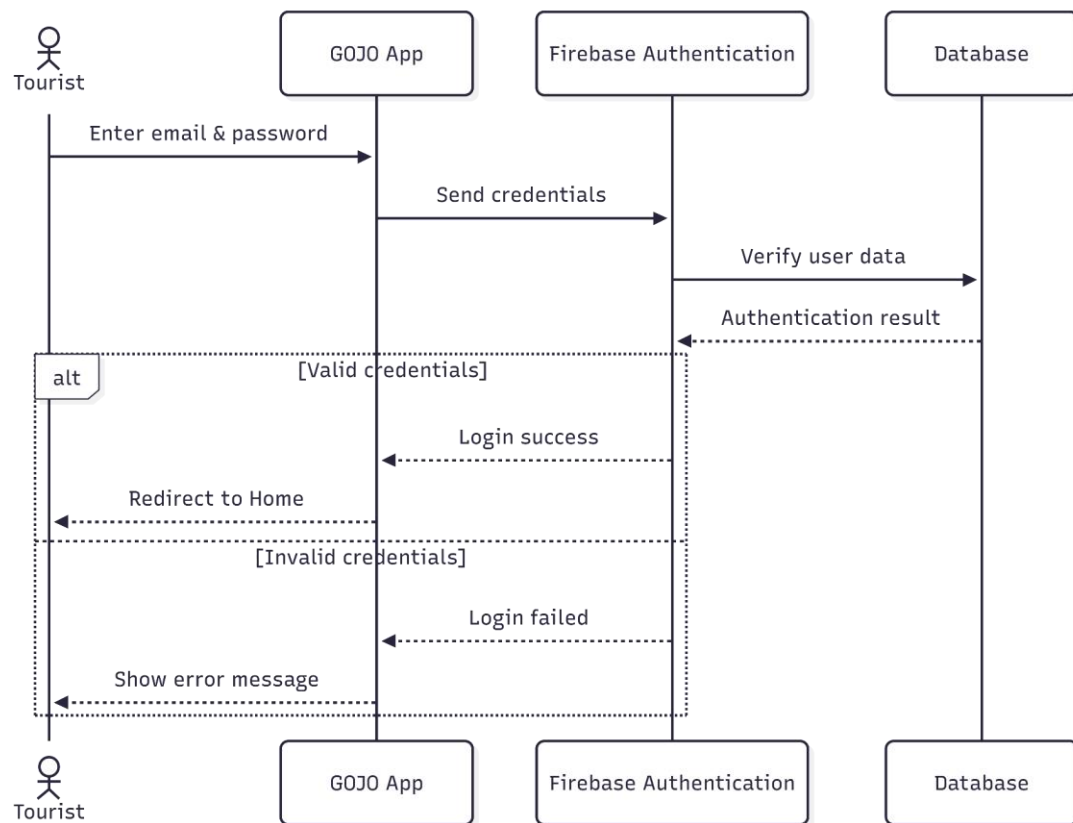| Use Case	UC01: Manage Account
Actor	Tourist
Description	Allows the user to create, access, secure, and logout from their personal account.
Data	Email, password, social media credentials.
Stimulus	User selects Register, Login, or Forgot Password options.
Response	System authenticates credentials or sends a recovery link via email.
Scenarios	1. User registers a new account. 2. User logs in via social media. 3. User resets a forgotten password.
Comments	Utilize Firebase Authentication for secure token and credential management.

Figure 15:Manage Account Sequence Diagram

Table 16:Manage Personal Profile Use Case Scenario

Use Case	UC02: Manage Personal Profile
Actor	Tourist
Description	The user updates their identity and travel interests to improve system suggestions.
Data	Name, travel preferences (historical, adventure, etc.), profile picture.
Stimulus	User enters the profile settings menu and modifies data.
Response	System saves and applies the updated preference data to the database.
Scenarios	1. User changes their interest from "Adventure" to "History".
Comments	Profile preferences directly feed into the AI Itinerary logic for personalization.

Table 17:Plan AI Itinerary Use Case Scenario

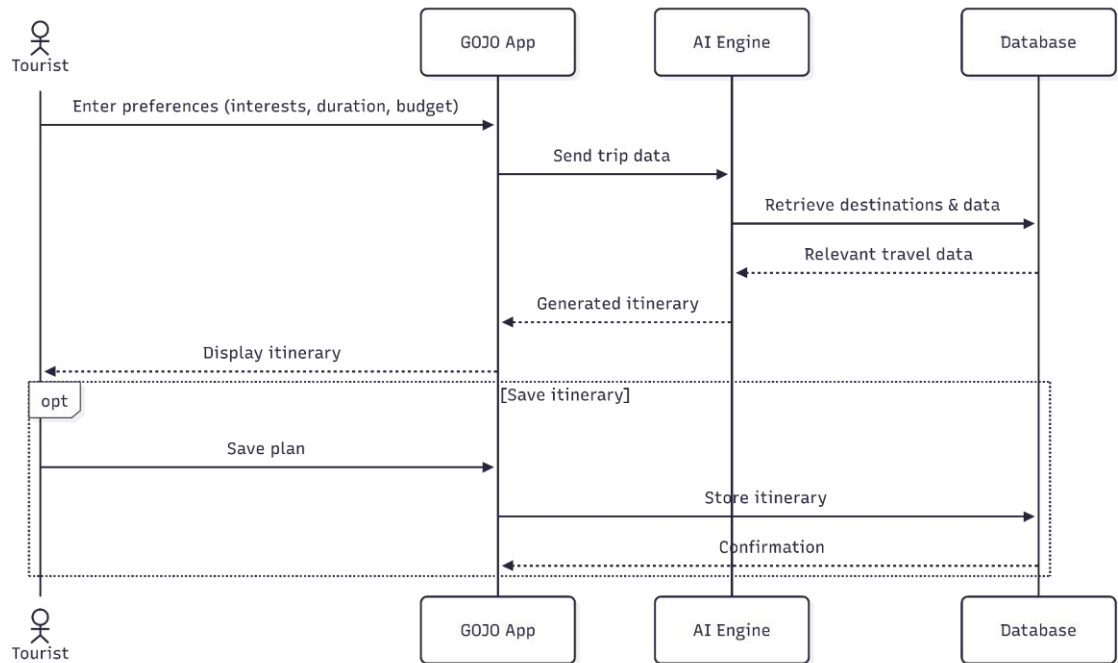| Use Case	UC03: Plan AI Itinerary
Actor	Tourist
Description	Generates a customized travel schedule and cost estimation based on user input.
Data	Trip duration, budget, interests, and selected hotel tiers.
Stimulus	User provides trip constraints and clicks "Generate Itinerary".
Response	System displays a daily plan and a total trip cost estimate.
Scenarios	1. User generates a 3-day history-focused plan for Petra and Jerash.
Comments	This represents the core competitive differentiator for the GOJO application.

Figure 16: Plan AI Itinerary Sequence Diagram

Table 18:Download Offline Maps Use Case Scenario

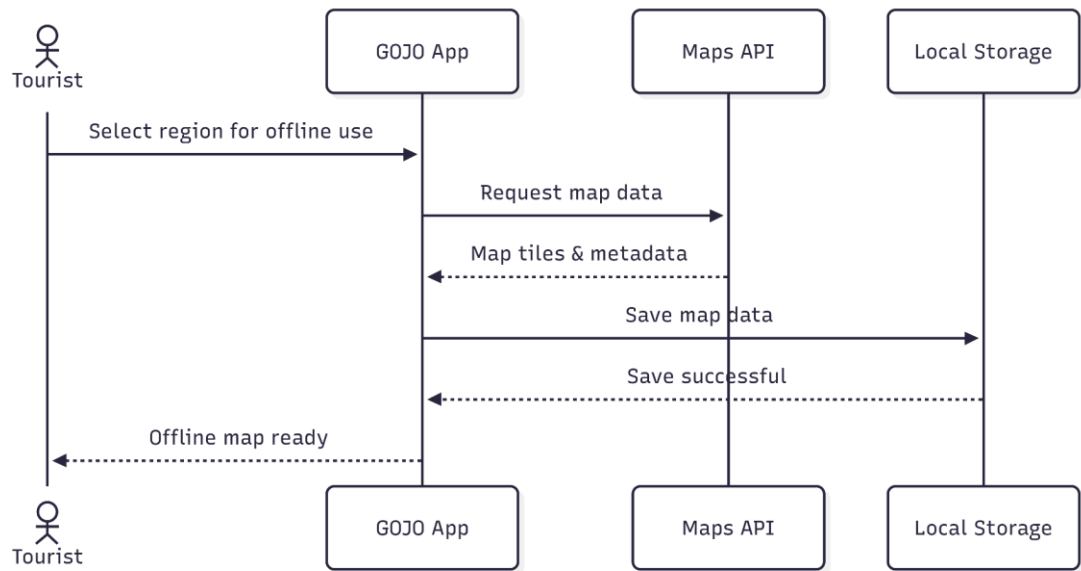| Use Case	UC04: Download Offline Maps
Actor	Tourist
Description	Saves map data and site information to the device for use without internet.
Data	Region selection, map tiles, and site metadata.
Stimulus	User selects the "Download for Offline Use" option on a specific area.
Response	System stores data locally and confirms download completion.
Scenarios	1. User downloads a map of Wadi Rum before losing cellular signal.
Comments	Crucial for international travelers facing roaming or connectivity constraints.

Figure 17:Download Offline Maps Sequence Diagram

Table 19:Review & Rate Spots Use Case Scenario

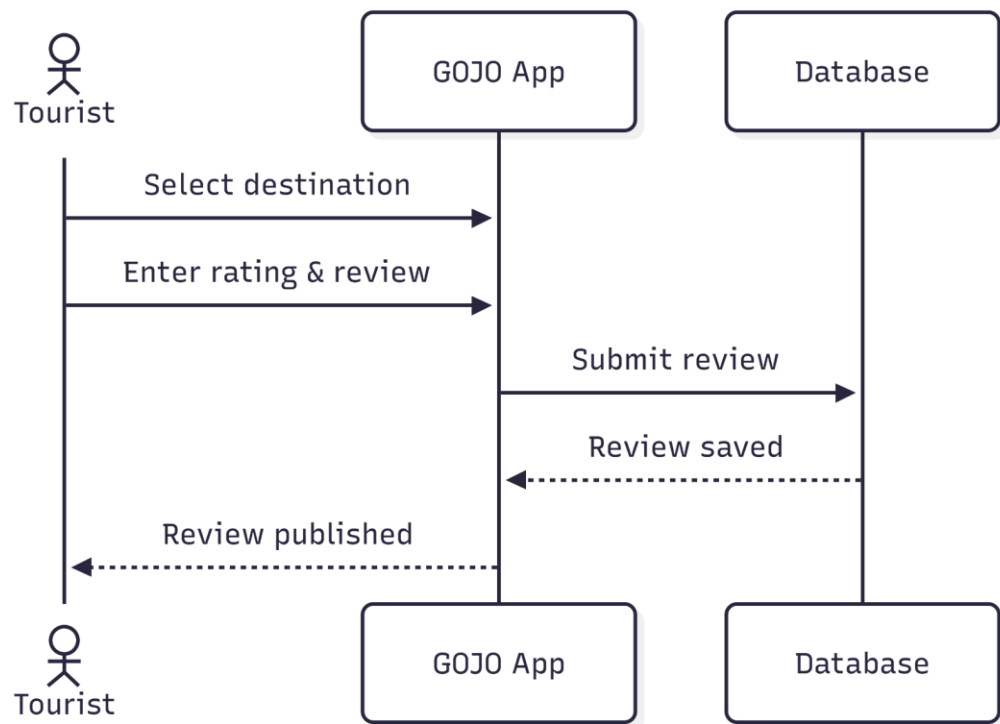| Use Case	UC05: Review & Rate Spots
Actor	Tourist
Description	User provides feedback and star ratings on visited locations and attractions.
Data	Star rating (1-5), written feedback comment, and location ID.
Stimulus	User selects a destination and clicks "Write a Review".
Response	Feedback is published and made visible to the GOJO community.
Scenarios	1. User rates a local restaurant 5 stars for authentic food quality.
Comments	This module builds community trust and supports local business quality.

Figure 18:Review & Rate Spots Sequence Diagram

Table 20:Manage Saved Items Use Case Scenario

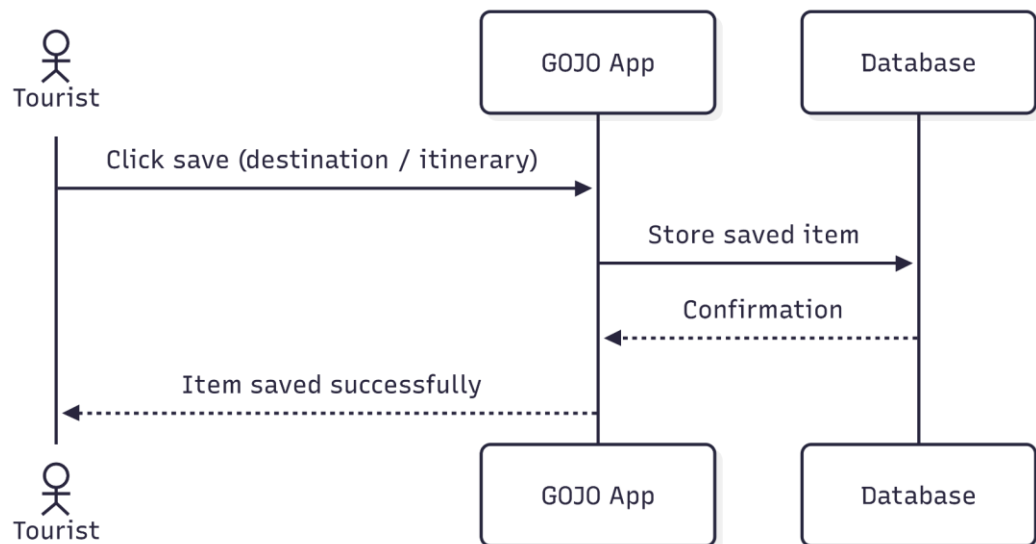| Use Case	UC06: Manage Saved Items
Actor	Tourist
Description	Users save specific spots or journal entries for later reference.
Data	Location IDs, personal notes, and timestamps.
Stimulus	User taps the "Save" icon on a destination card.
Response	Item is added to the Favorites List or personal Trip Journal.
Scenarios	1. User saves a specific souvenir shop to visit at the end of their trip.
Comments	Enables quick retrieval of curated content for better trip organization.

Figure 19: Manage Saved Items Sequence Diagram

Table 21: Share Trip Plan Use Case Diagram Scenario

Use Case	UC07: Share Trip Plan
Actor	Tourist
Description	Allows sharing of finalized itineraries with friends or family via external apps.
Data	Itinerary link, plain text summary of the trip.
Stimulus	User clicks the "Share" button on their saved itinerary.
Response	System generates a shareable link or message content.
Scenarios	1. User sends their 5-day Jordan plan to a travel partner via WhatsApp.
Comments	This feature increases app visibility and facilitates group travel planning.

Table 22: Access Emergency Info Use Case Scenario

Use Case	UC08: Access Emergency Info
Actor	Tourist
Description	Provides one-tap access to vital local emergency contacts and help centers.
Data	Emergency phone numbers, embassy locations, and GPS location.
Stimulus	User opens the "Emergency Contact" module.
Response	System displays dial-able buttons for police, medical, and help services.
Scenarios	1. User needs to contact the tourist police immediately.
Comments	Designed to enhance tourist safety and satisfaction during the trip.

Table 23: View Cultural Guide Use Case Scenario

Use Case	UC09: View Cultural Guide
Actor	Tourist
Description	Provides cultural "dos and don'ts" and etiquette tips for Jordan.
Data	Text guides on Jordanian social norms and etiquette.
Stimulus	User selects the "Cultural Tips" from the main menu.
Response	System displays categories such as dress codes or social greetings.
Scenarios	1. User checks appropriate attire before visiting a religious site.
Comments	Essential for promoting cultural preservation and respectful tourism.

Table 24: Register Local Business Use Case Scenario

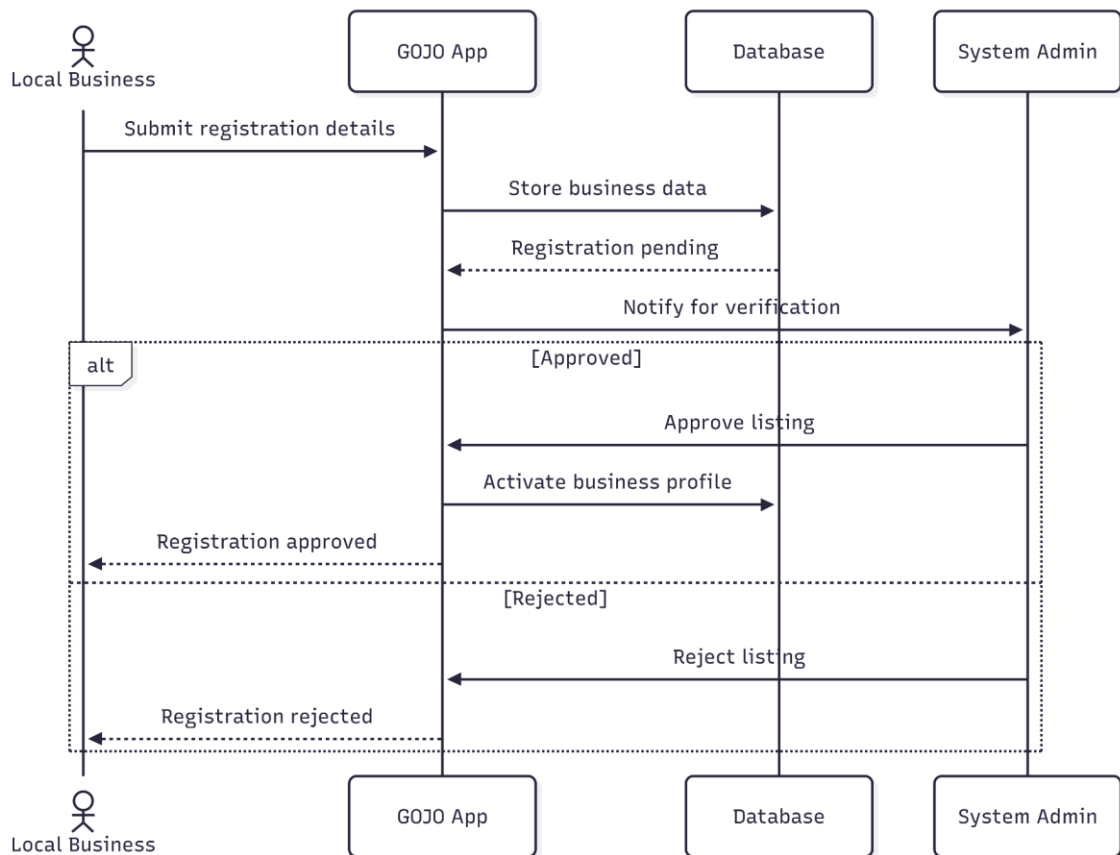| Use Case	UC10: Register Local Business
Actor	Local Business
Description	A business owner creates a specialized account to list their services.
Data	Business name, tax registration info, service type.
Stimulus	User selects "Register as Local Business" on the platform.
Response	System creates a business profile for verification by administrators.
Scenarios	1. A local artisan shop registers to be discovered by global tourists.
Comments	This feature is designed to empower small businesses and boost the local economy.

Figure 20:Register Local Business Sequence Diagram

Table 25: Manage Service Listing Use Case Scenario

Use Case	UC11: Manage Service Listing
Actor	Local Business, System Admin
Description	Business owners update their location, descriptions, and current offers.
Data	Address, photos, service descriptions, and operating hours.
Stimulus	User edits their listing details via the Local Business Dashboard.
Response	System updates the public listing on the map and search results.
Scenarios	1. A café updates its menu and opening hours for the holiday season.
Comments	Provides vital digital visibility to services that often lack an online presence.

Table 26: Manage App Content Use Case Scenario

Use Case	UC12: Manage App Content
Actor	System Admin
Description	Admin updates the core database, including events and cultural guides.
Data	Destination metadata, event calendar dates, and guide text.
Stimulus	Admin logs into the backend Dashboard to modify content.
Response	System saves changes and synchronizes content for all users.
Scenarios	1. Admin adds a newly announced cultural festival to the calendar.
Comments	Regular system updates are essential for operational success and accuracy.

4.7 Non-Functional Requirements

Non-functional requirements define the quality attributes and constraints of the GOJO system.

Table 27:Non-Functional Requirements

Performance	The system shall provide fast performance by loading core application screens within 3 seconds, generating AI-based itineraries within 5 seconds on average, and allowing offline content to be accessed without noticeable delay.
Usability	The system shall provide an intuitive user interface suitable for users with minimal technical knowledge and support the English language.
Reliability	The system shall ensure reliable operation by maintaining 99% uptime excluding scheduled maintenance, preserving offline functionality during internet outages, and protecting user data from loss during system crashes or restarts.
Security	The system shall ensure security by implementing secure user authentication, protecting stored user data from unauthorized access, complying with data privacy regulations, and using HTTPS for all API communications.
Scalability	The system shall be scalable by supporting an increasing number of users without performance degradation and allowing backend services to expand to accommodate future growth and partnerships.
Compatibility	The application shall be compatible with Android and iOS platforms and support multiple screen sizes and resolutions.

4.8 Data Requirements

The data requirement describes the data required for system operation and decision-making.

- User Data: Includes user ID, name, email, preferences, saved itineraries, favorite point of interests, and reviews/ratings.

- Location and Destination Data: Includes point of interest's ID, name, category, coordinates, description, contact info, and operating hours.

- Itinerary Data: Includes itinerary ID, user ID, trip duration, selected point of interest, generated schedule, and AI metadata.

- Review and Feedback Data: Includes review ID, user ID, point of interest ID, rating, review text, and timestamp.

- System and Log Data: Includes authentication logs, API usage, error reports, and performance metrics.

- Offline Data Storage: Includes cached maps, saved points of interest, stored itineraries, and essential offline content that are pre-downloaded during internet connectivity and stored locally for offline access.

CHAPTER FIVE: SYSTEM ANALYSIS AND DESIGN
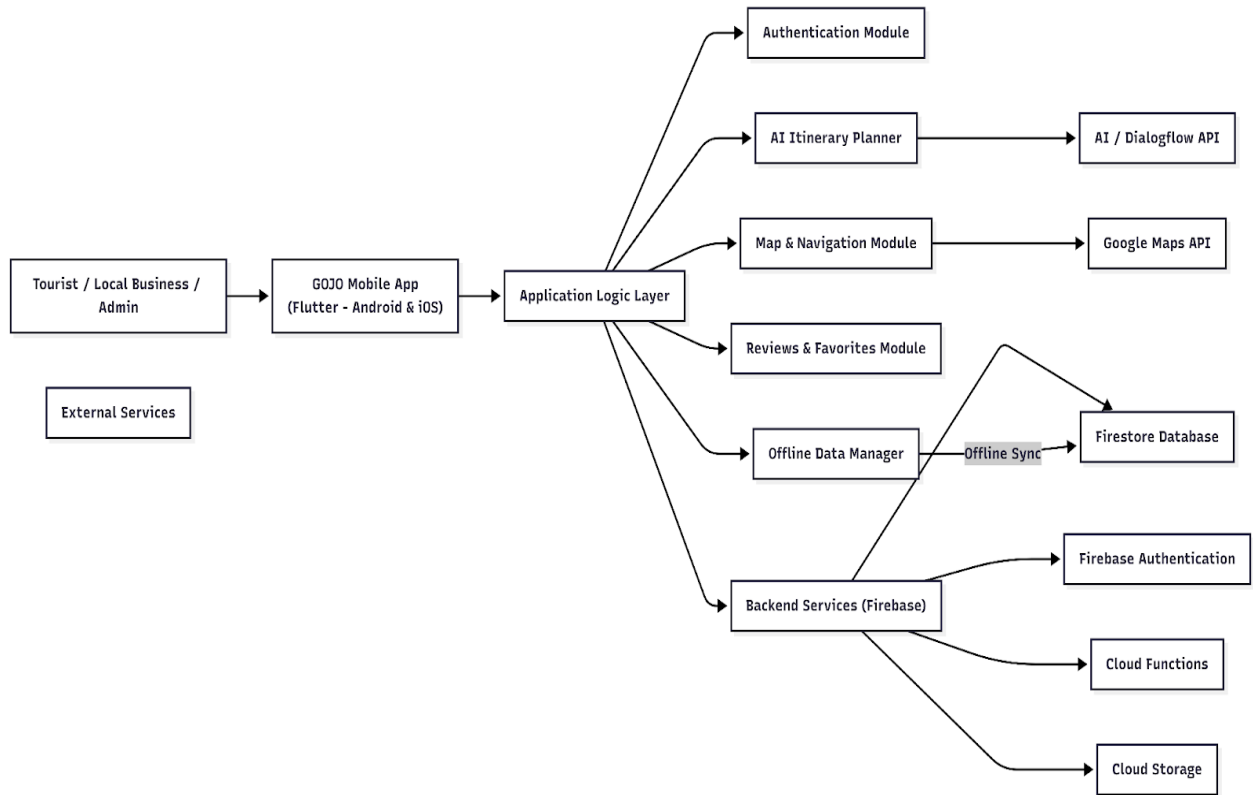
5.1 Architecture Design

Figure 21: Architecture Design Diagram

5.2 Object Oriented Analysis and Design

5.2.1 Activity Diagrams

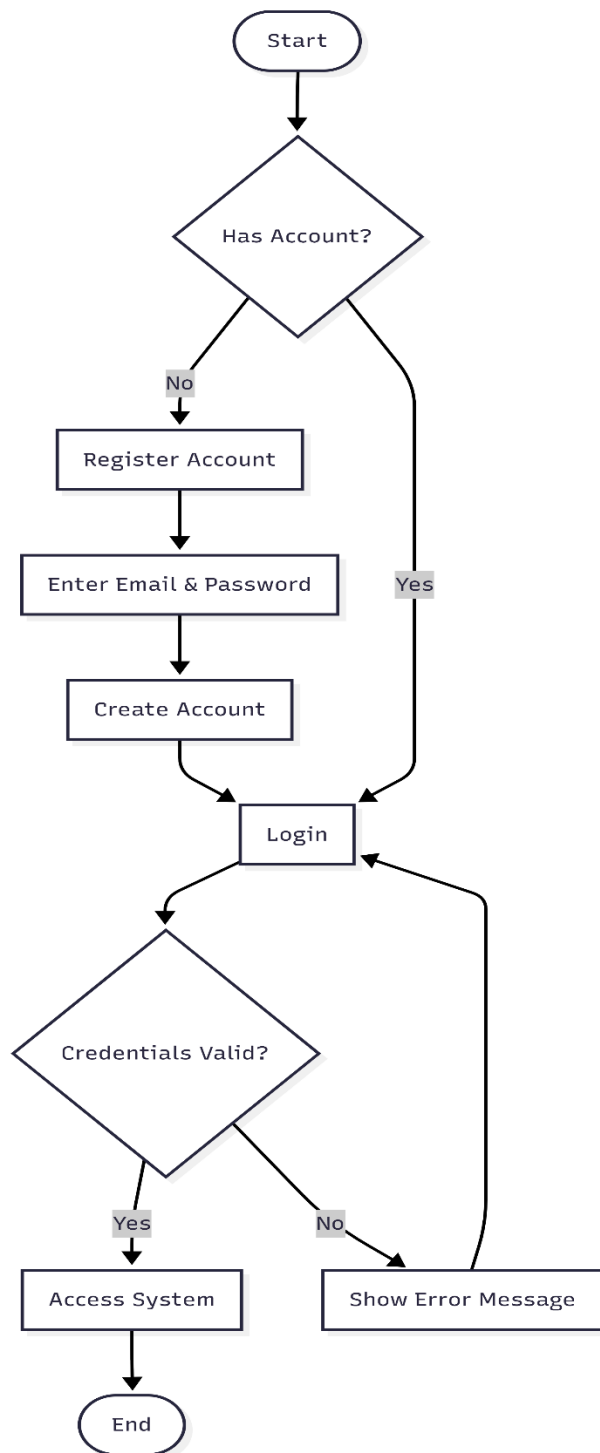### 5.2.1.1 Activity diagram - Manage Account

Figure 22: 1 Activity diagram - Manage Account Diagram
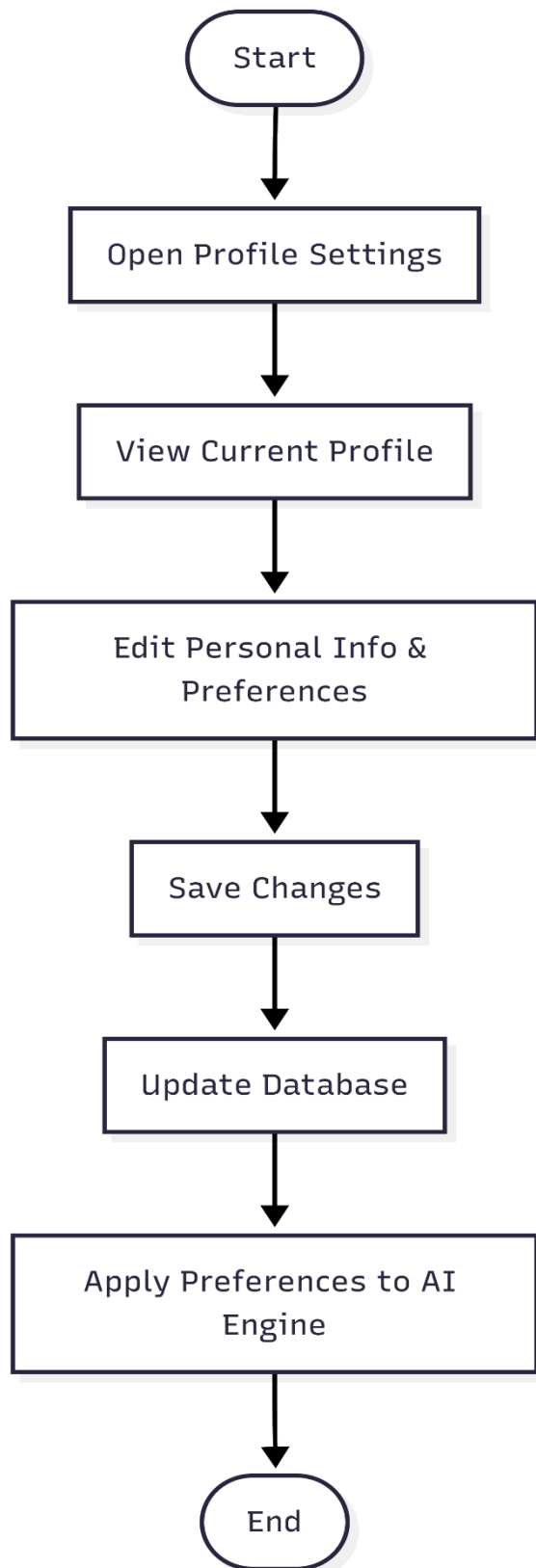
5.2.1.2 Activity diagram - Manage Personal Profile

Figure 23: Activity diagram - Manage Personal Profile Diagram
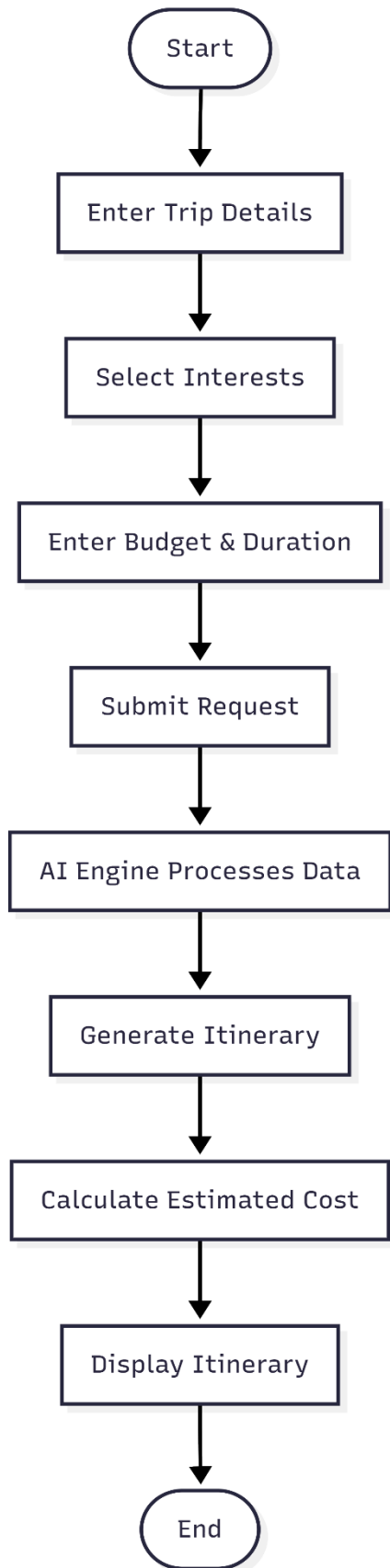
5.2.1.3 Activity Diagram - Plan AI Itinerary

```
          ┌─────────┐
          │  Start  │
          └─────────┘
               │
               ▼
     ┌─────────────────────┐
     │  Enter Trip Details │
     └─────────────────────┘
               │
               ▼
     ┌─────────────────────┐
     │  Select Interests   │
     └─────────────────────┘
               │
               ▼
     ┌─────────────────────┐
     │ Enter Budget &      │
     │ Duration            │
     └─────────────────────┘
               │
               ▼
     ┌─────────────────────┐
     │  Submit Request     │
     └─────────────────────┘
               │
               ▼
     ┌─────────────────────┐
     │ AI Engine Processes │
     │ Data                │
     └─────────────────────┘
               │
               ▼
     ┌─────────────────────┐
     │ Generate Itinerary  │
     └─────────────────────┘
               │
               ▼
     ┌─────────────────────┐
     │ Calculate Estimated │
     │ Cost                │
     └─────────────────────┘
               │
               ▼
     ┌─────────────────────┐
     │ Display Itinerary   │
     └─────────────────────┘
               │
               ▼
          ┌─────────┐
          │   End   │
          └─────────┘
```

5.2.1.4 Activity Diagram - Download Offline Maps

```
                    ┌─────────┐
                    │  Start  │
                    └─────────┘
                         │
                         ▼
              ┌─────────────────────────┐
              │ Select Destination Area │
              └─────────────────────────┘
                         │
                         ▼
              ┌─────────────────────────┐
              │ Choose Offline Download  │
              └─────────────────────────┘
                         │
                         ▼
              ┌─────────────────────────┐
              │ Check Storage Availability│
              └─────────────────────────┘
                         │
                         ▼
                    ◇ Enough Space? ◇
                    /            \
                  No              Yes
                  │                │
                  ▼                ▼
          ┌──────────────┐  ┌──────────────────┐
          │ Show Warning │  │ Download Map Data │
          └──────────────┘  └──────────────────┘
                                   │
                                   ▼
                            ┌──────────────┐
                            │ Store Locally │
                            └──────────────┘
                                   │
                                   ▼
                          ┌──────────────────┐
                          │ Confirm Download  │
                          └──────────────────┘
                                   │
                                   ▼
                              ┌─────────┐
                              │   End   │
                              └─────────┘
```
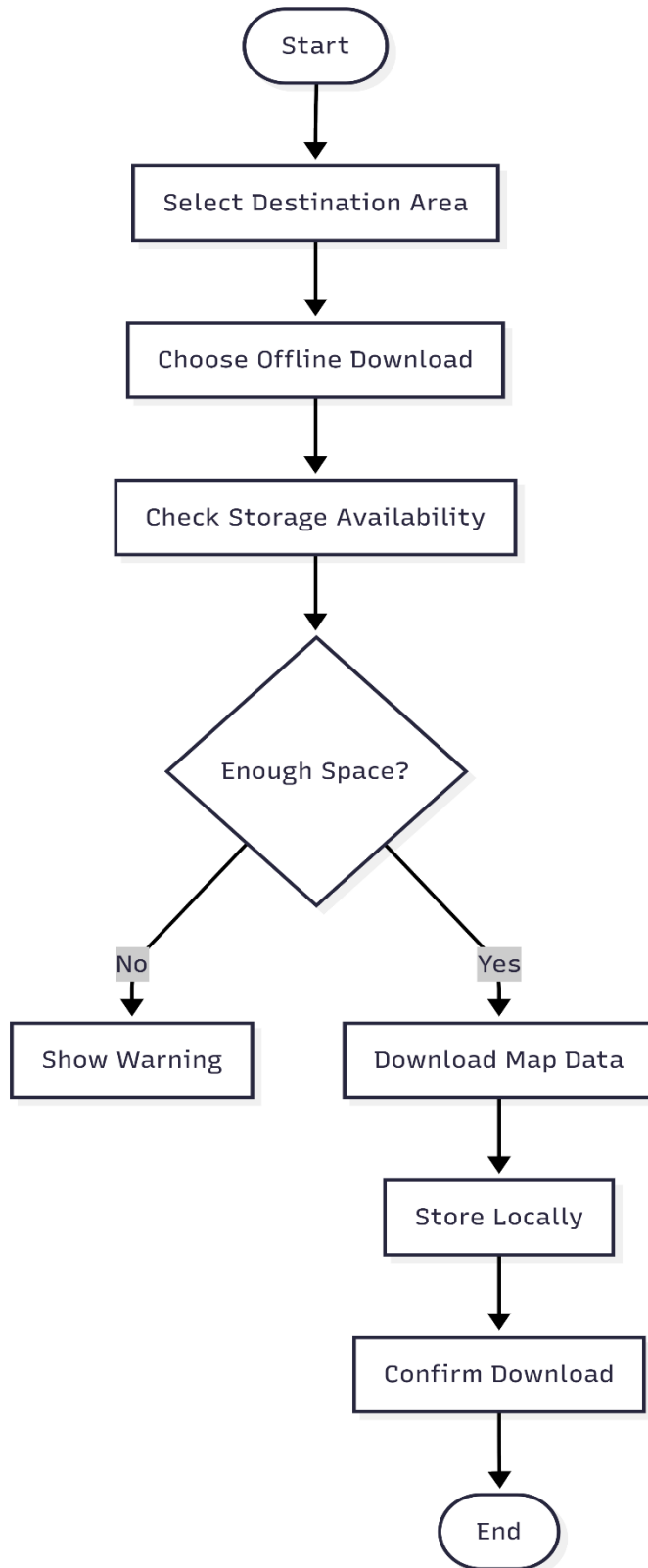
Figure 25: Activity Diagram - Download Offline Maps Diagram

5.2.1.5 Activity Diagram - Review & Rate Spots
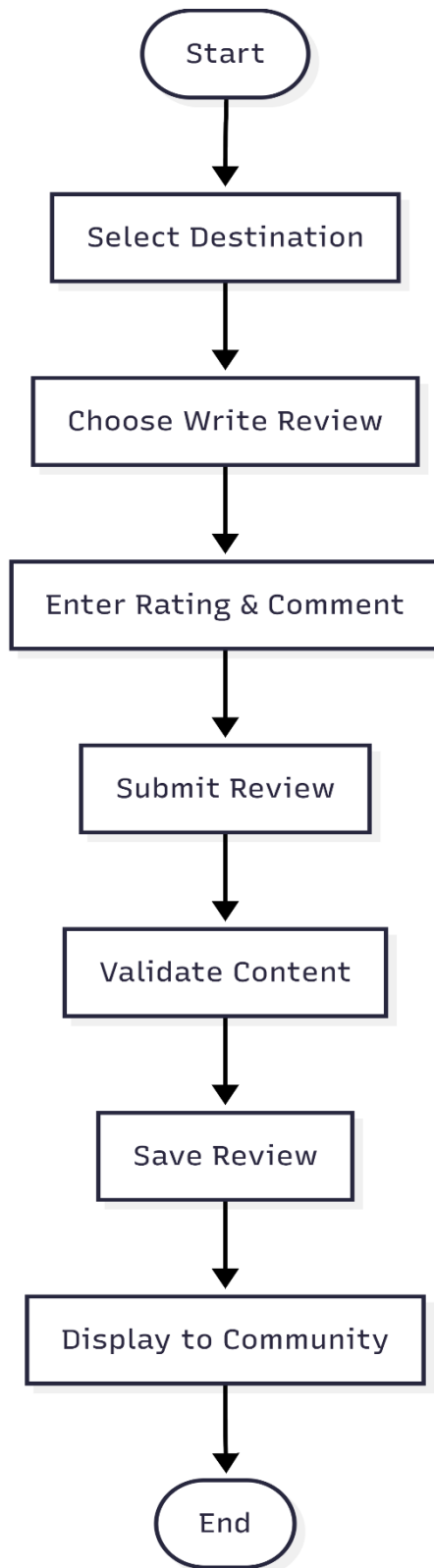
Figure 26: Activity Diagram - Review & Rate Spots Diagram

5.2.1.6 Activity Diagram - Manage Saved Items
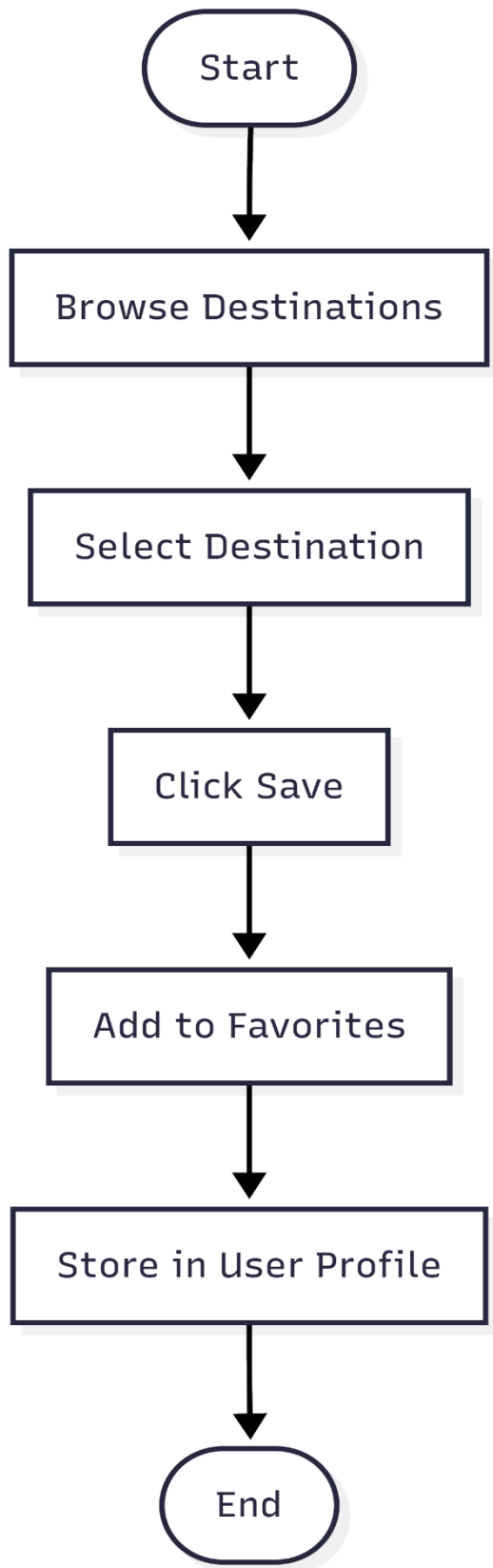
Figure 27:Activity Diagram - Manage Saved Items Diagram

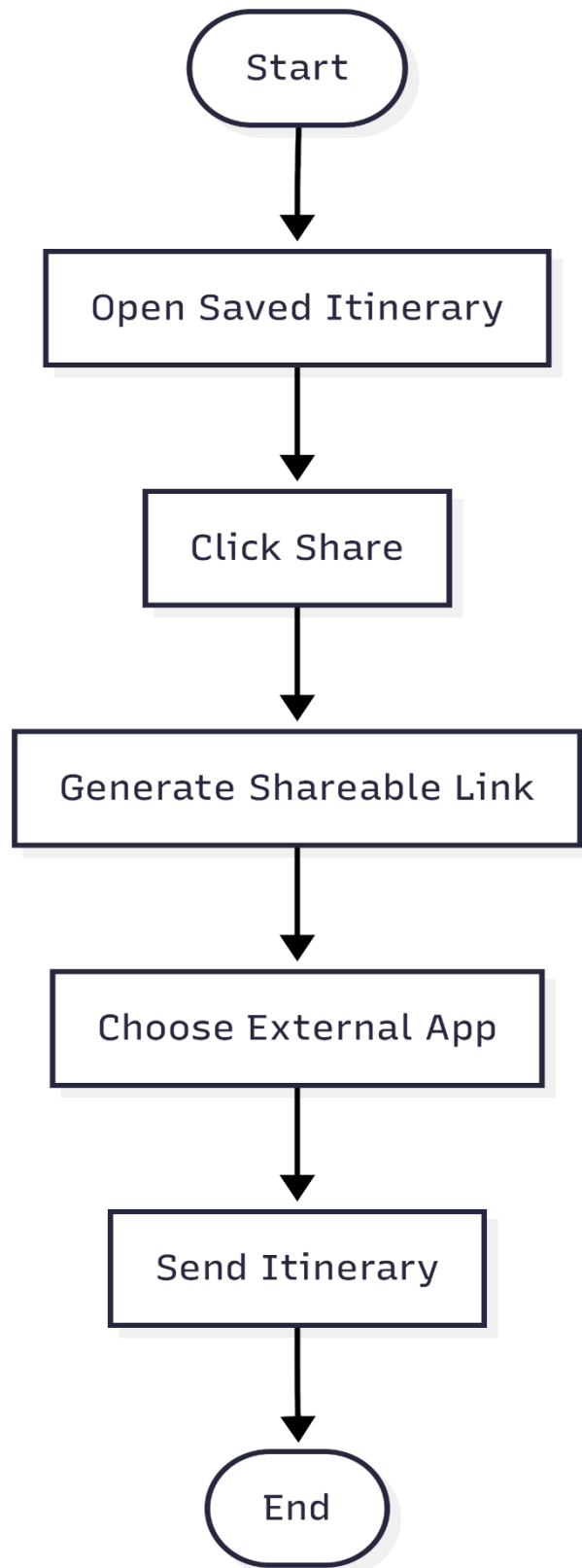## 5.2.1.7 Activity Diagram - Share Trip Plan

Figure 28: Activity Diagram -Share Trip Plan Diagram

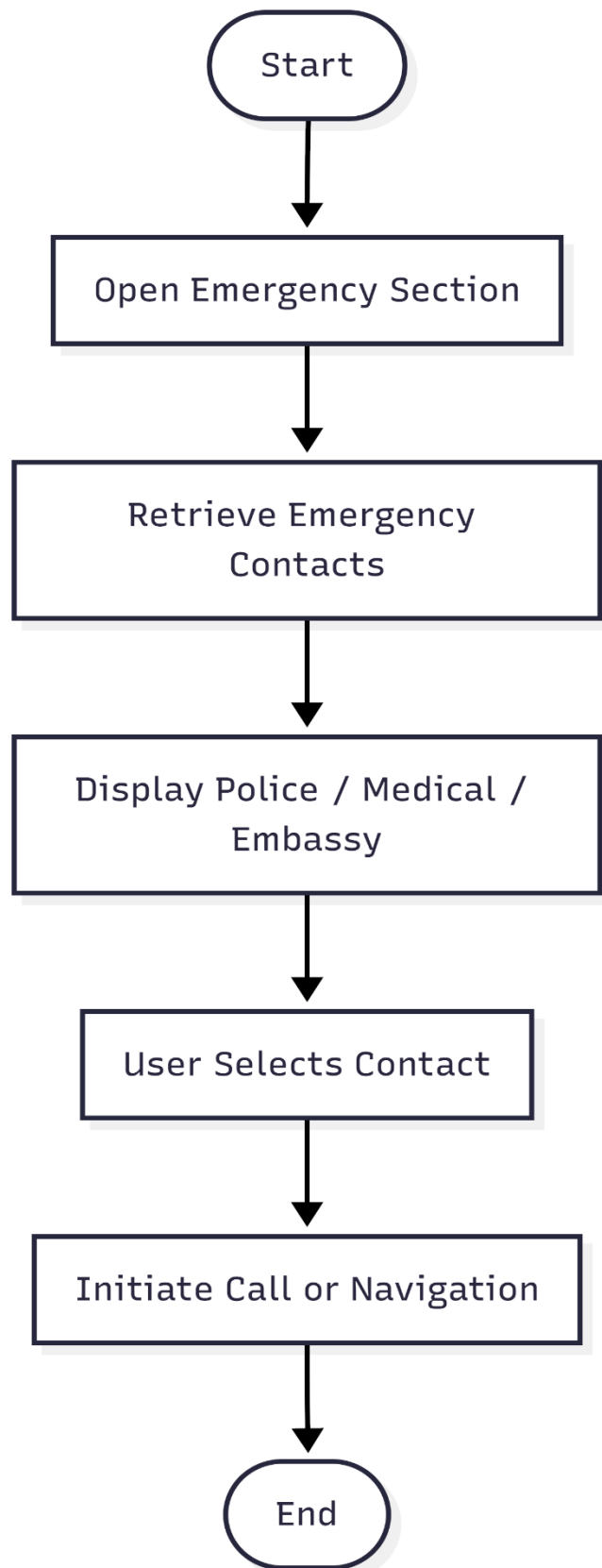## 5.2.1.8 Activity Diagram - Access Emergency Info

Figure 29: Activity Diagram - Access Emergency Info Diagram

Start

Open Cultural Guide

Select Category

View Cultural Tips

Read Etiquette Guidelines

End

Figure 30: Activity Diagram- View Cultural Guide Diagram

5.2.1.10 Activity Diagram - Register Local Business
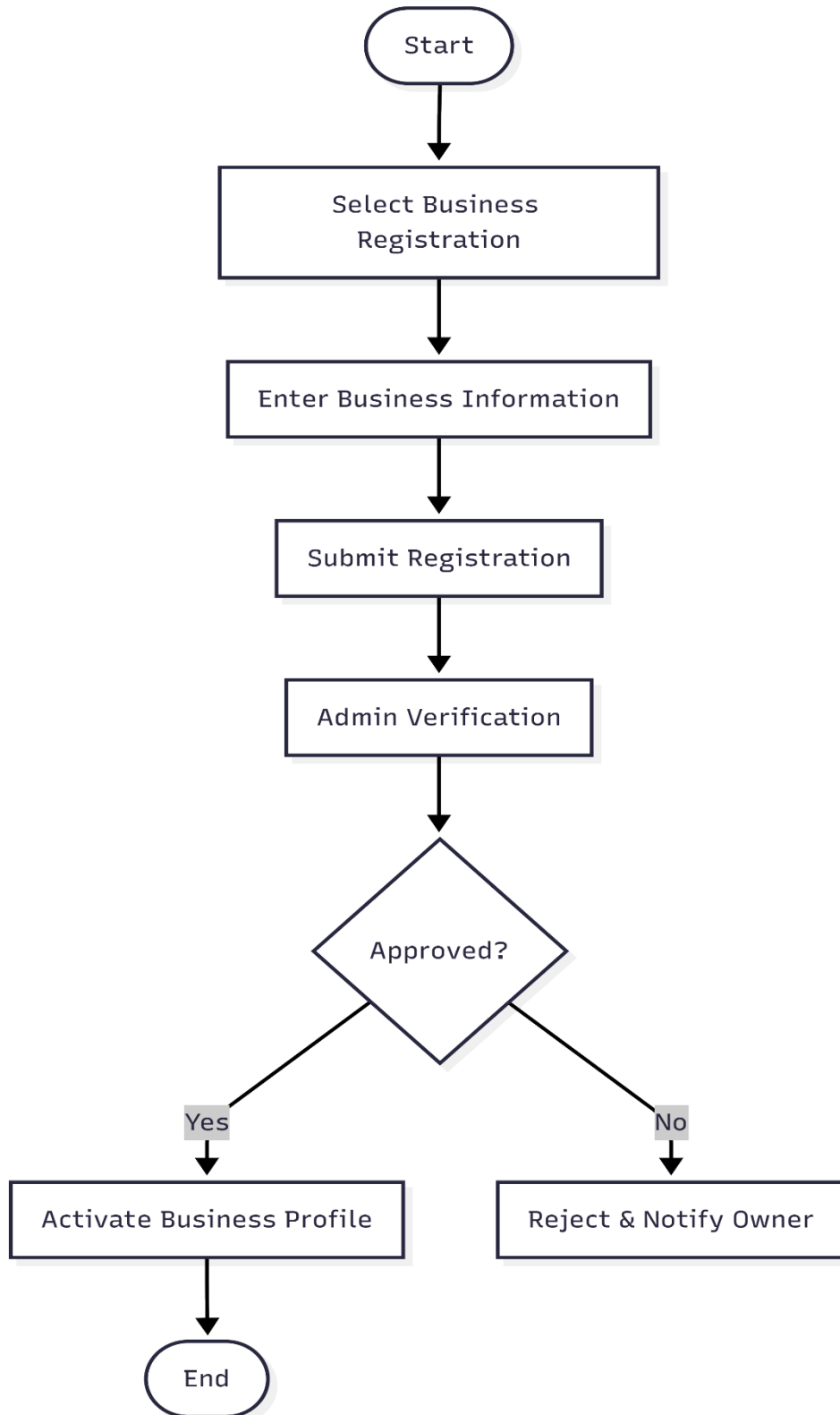
Figure 31:Activity Diagram- Register Local Business Diagram

```
        ┌─────────────┐
        │    Start    │
        └─────────────┘
               │
               ▼
   ┌───────────────────────────┐
   │  Login as Business Owner  │
   └───────────────────────────┘
               │
               ▼
   ┌───────────────────────────┐
   │  Open Business Dashboard  │
   └───────────────────────────┘
               │
               ▼
   ┌───────────────────────────┐
   │   Edit Services & Details │
   └───────────────────────────┘
               │
               ▼
      ┌─────────────────────┐
      │    Save Updates     │
      └─────────────────────┘
               │
               ▼
   ┌───────────────────────────┐
   │   Update Public Listing   │
   └───────────────────────────┘
               │
               ▼
        ┌─────────────┐
        │     End     │
        └─────────────┘
```

Figure 32: Activity Diagram- Manage Service Listing Diagram

5.2.1.12 Activity Diagram -Manage App Content


```
        ( Start )
            │
            ▼
     ┌──────────────┐
     │  Admin Login │
     └──────────────┘
            │
            ▼
 ┌────────────────────────┐
 │  Open Admin Dashboard  │
 └────────────────────────┘
            │
            ▼
 ┌────────────────────────┐
 │   Add / Update Content │
 └────────────────────────┘
            │
            ▼
     ┌──────────────┐
     │ Validate Data│
     └──────────────┘
            │
            ▼
     ┌──────────────┐
     │Publish Updates│
     └──────────────┘
            │
            ▼
 ┌────────────────────────┐
 │  Sync Data to Users    │
 └────────────────────────┘
            │
            ▼
         ( End )
```
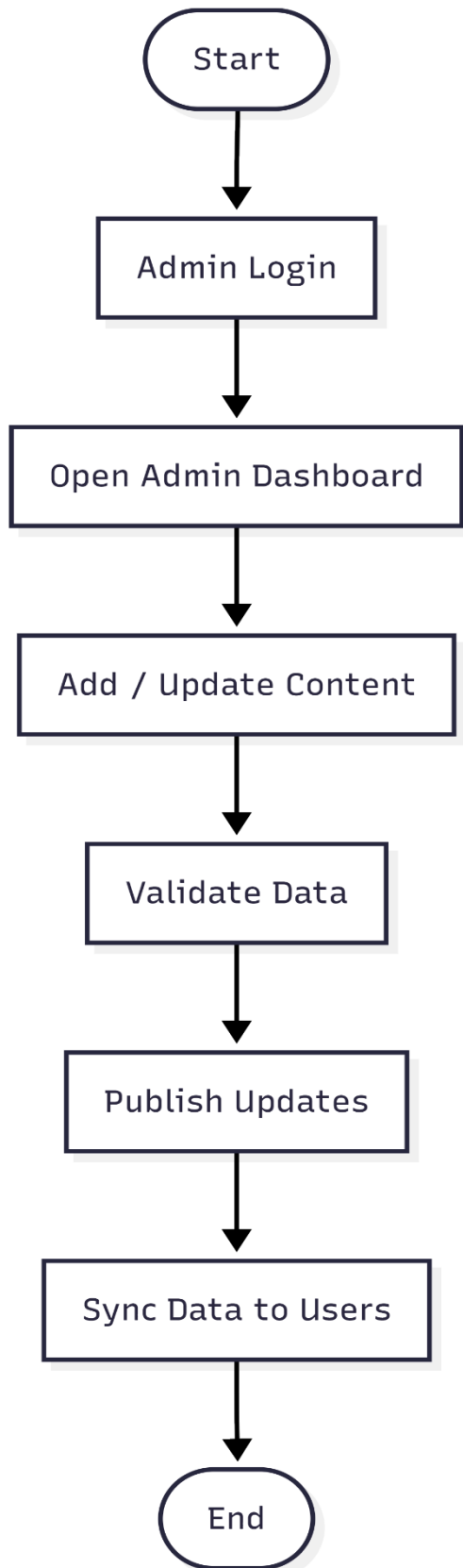
Figure 33: Activity Diagram - Manage App Content Diagram

5.2.2 Class Diagram
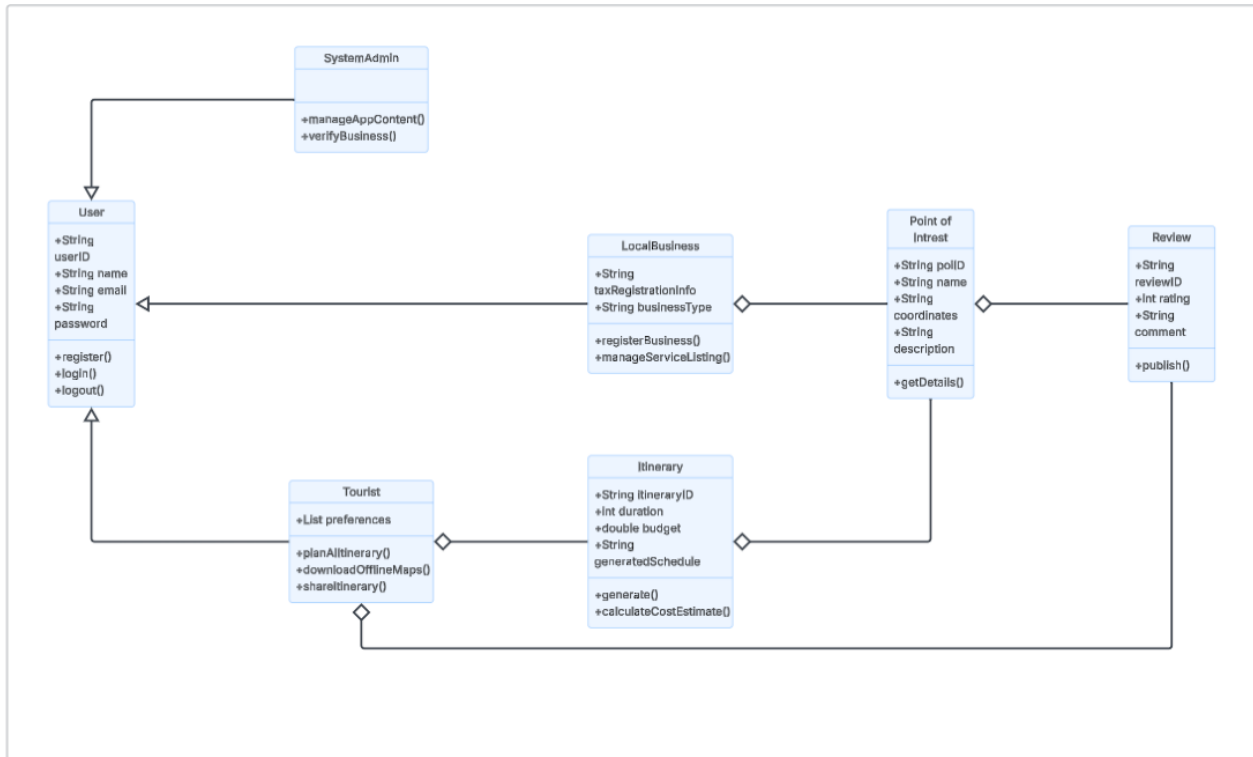
Figure 34: Class Diagram

5.2.3.1 State Diagrams -Itinerary
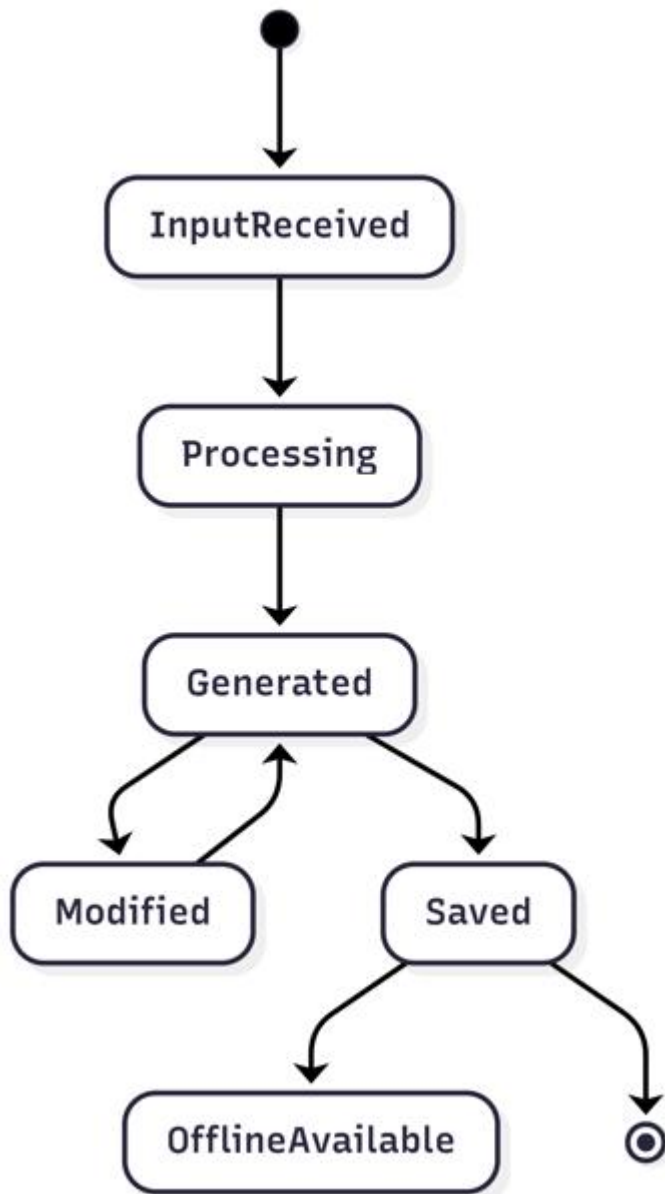
Figure 35:Itinerary State Diagram

5.2.3.2 State Diagrams -User Session
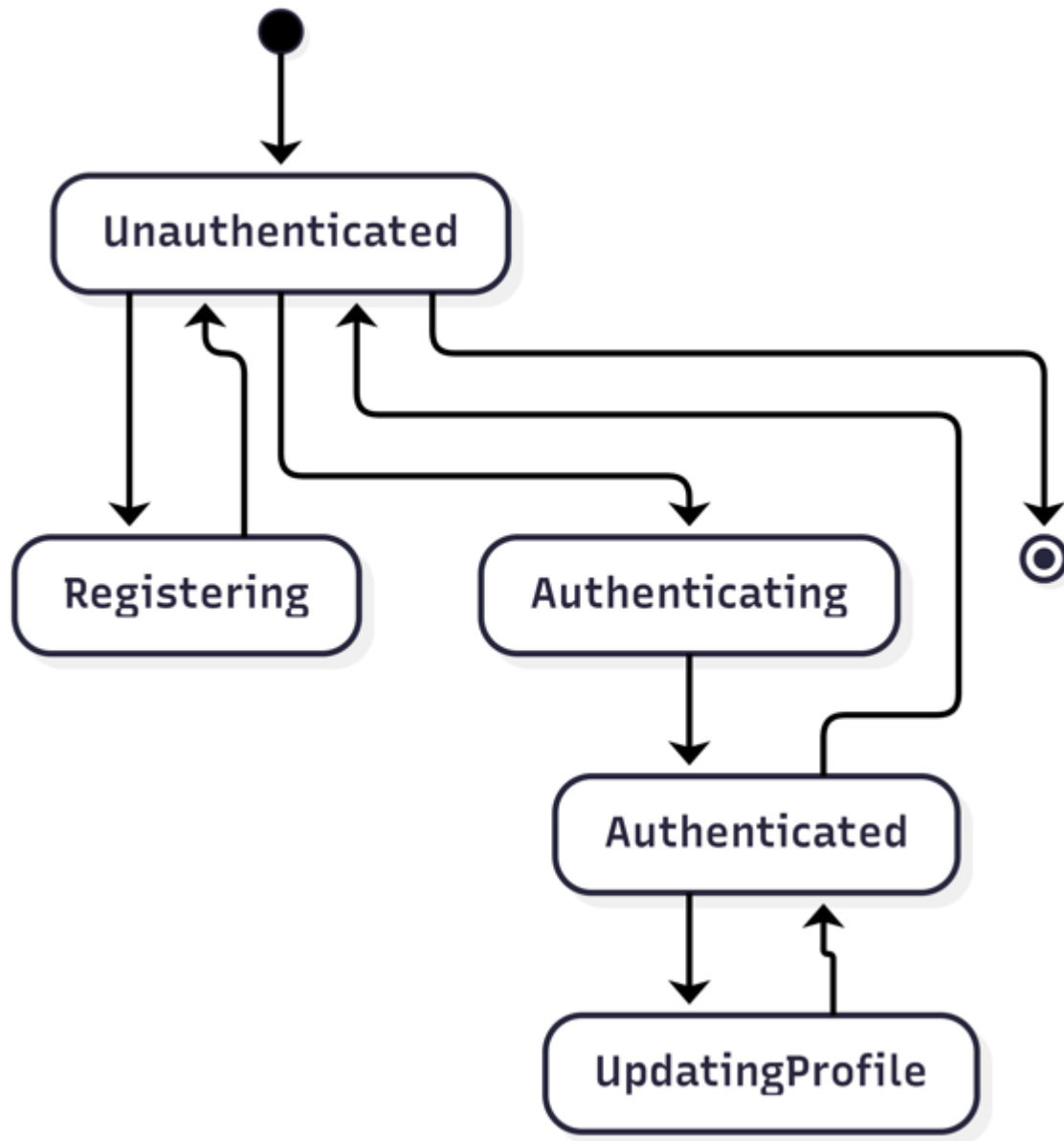
Figure 36:User Session State Diagram

5.2.3.3 State Diagrams -Business Listing
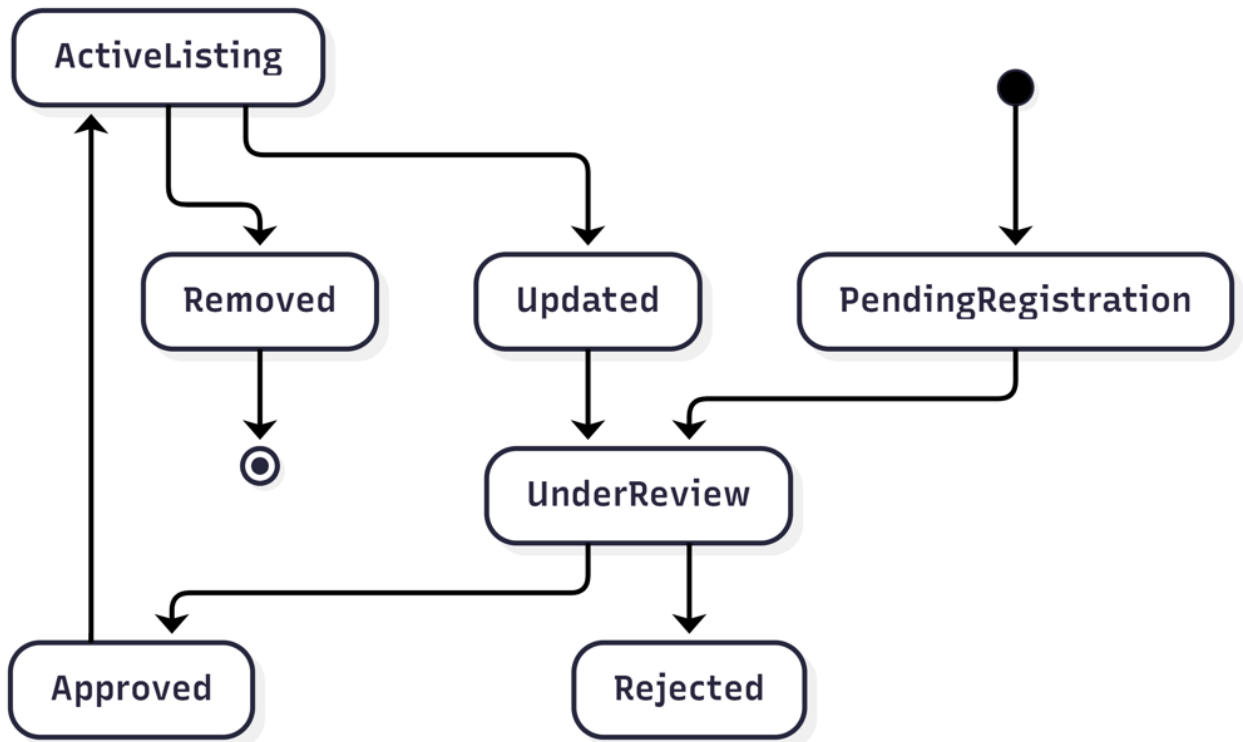
Figure 37:Business Listing State Diagram

5.3 ERD analysis and Database Design
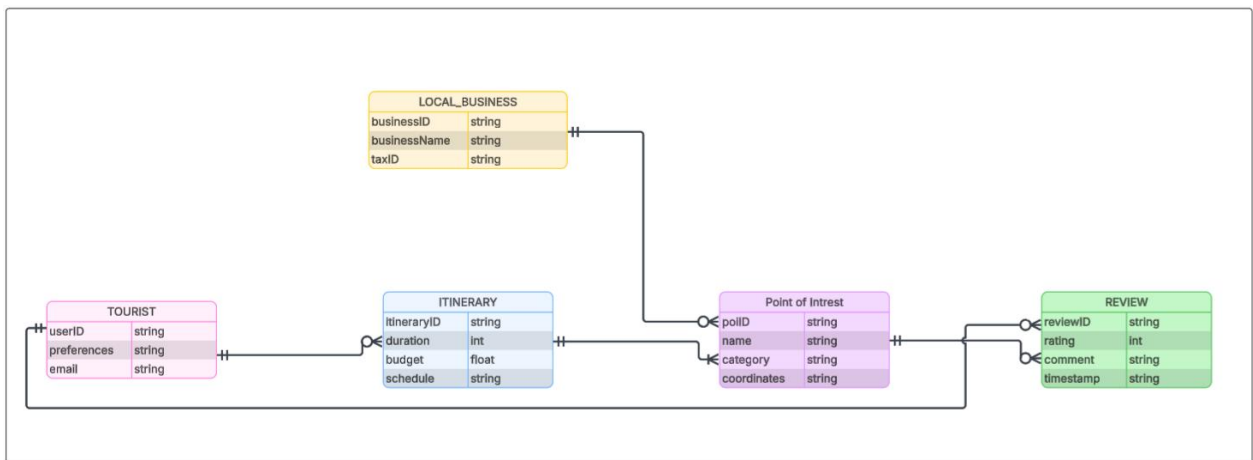
Figure 38:ERD analysis and Database Design

5.4 Graphical User Interface Design
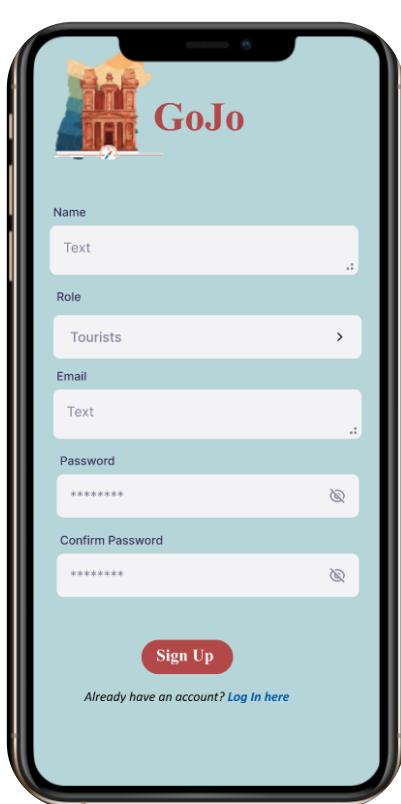
Figure 39: The Sign Up Page Prototype
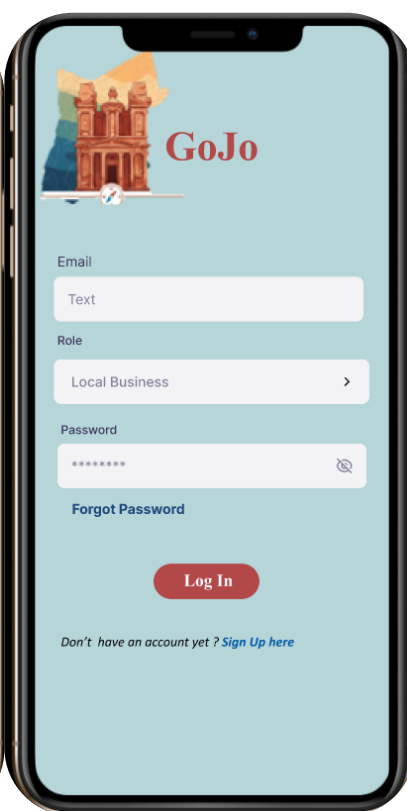
Figure 40:The Sign In Page Prototype
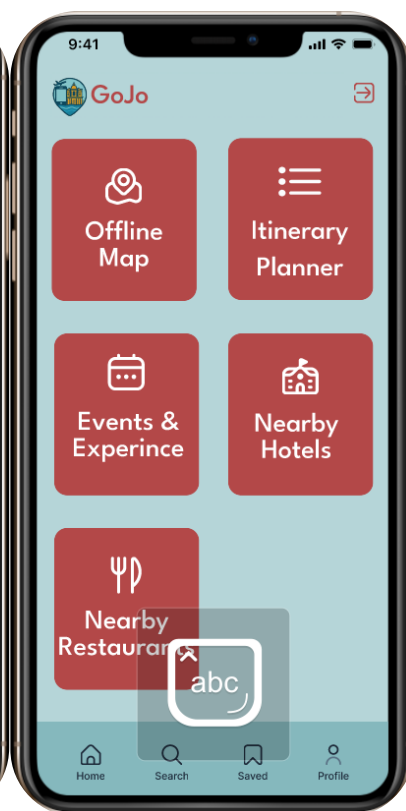
Figure 41:The Home Page Prototype

Figure 42: The Offline Map Page Prototype
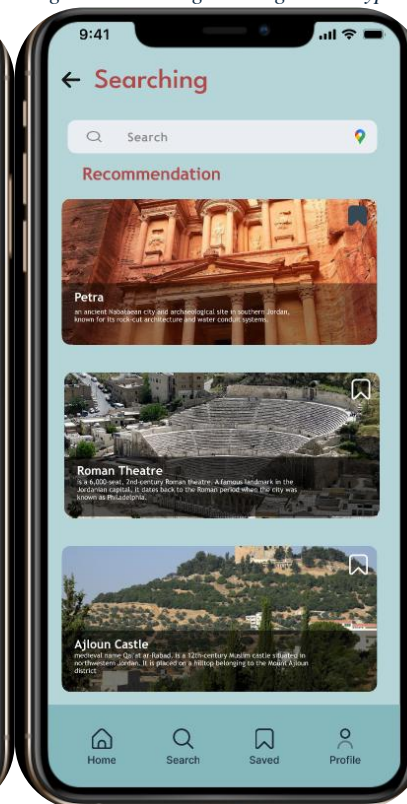
Figure 43: The Search Page Prototype

Figure 44: The Events Page Prototype
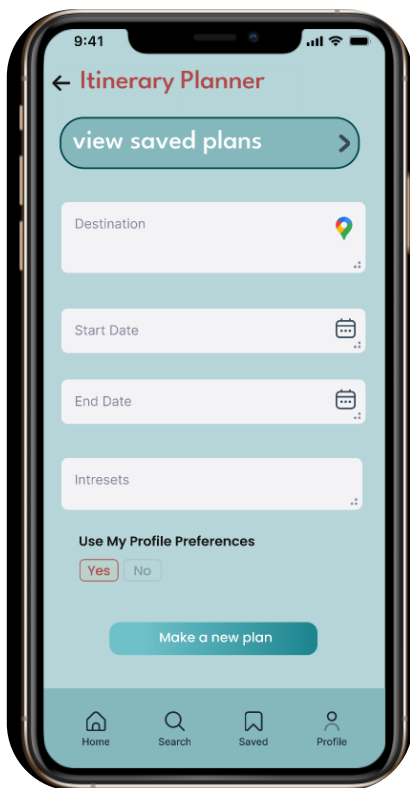
Figure 45: The Itinerary Planning Page Prototype
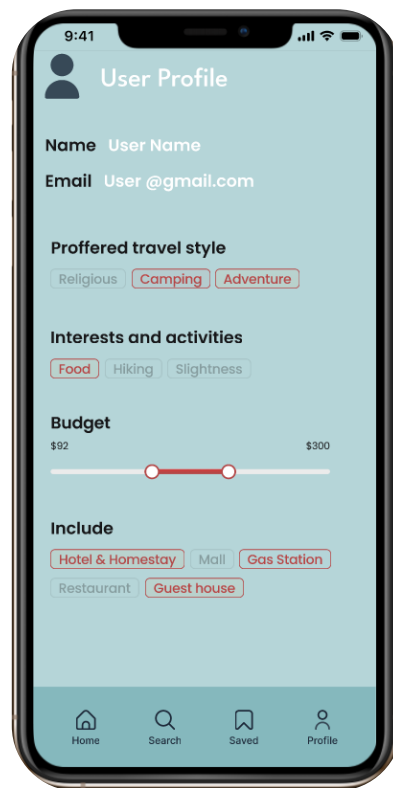
Figure 46: The User Profile Page Prototype
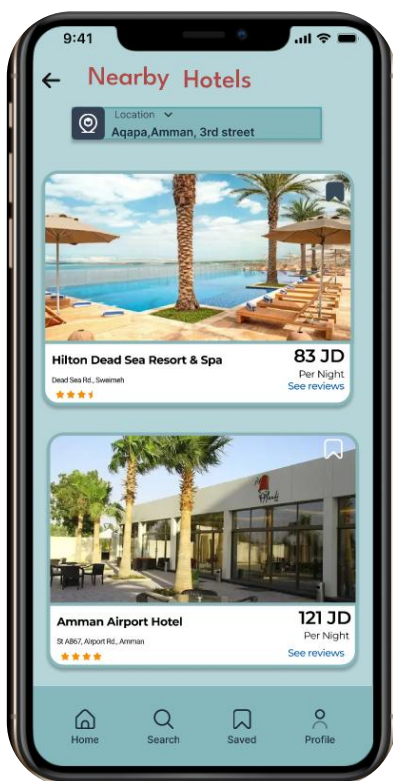
Figure 47: The Nerby Hotels Page Prototype
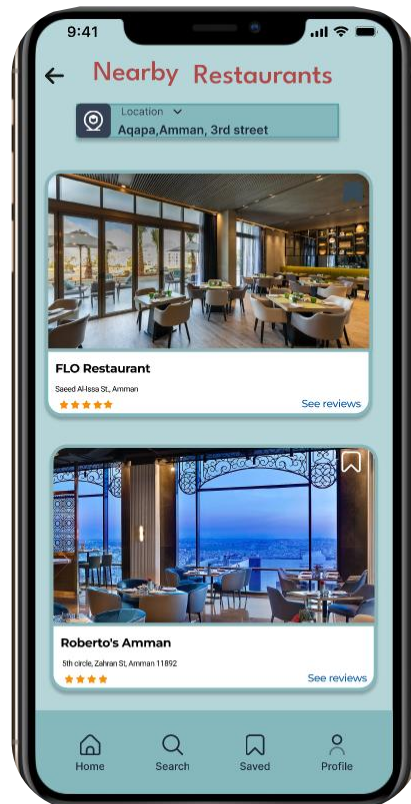
Figure 48: The Nerby Restaurant Page Prototype
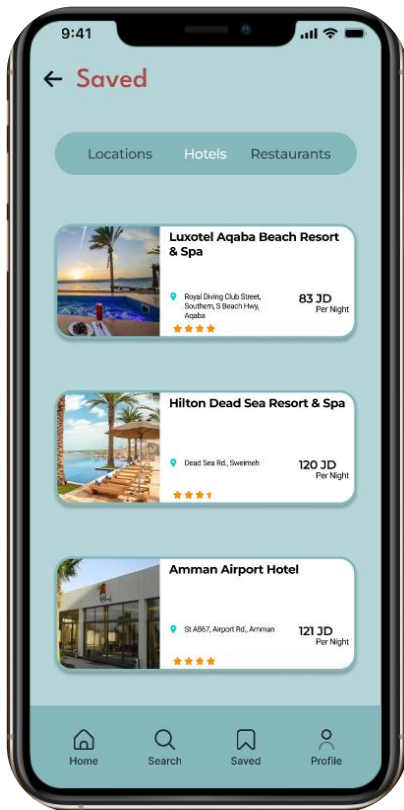
Figure 49: The Saved Data Page Prototype
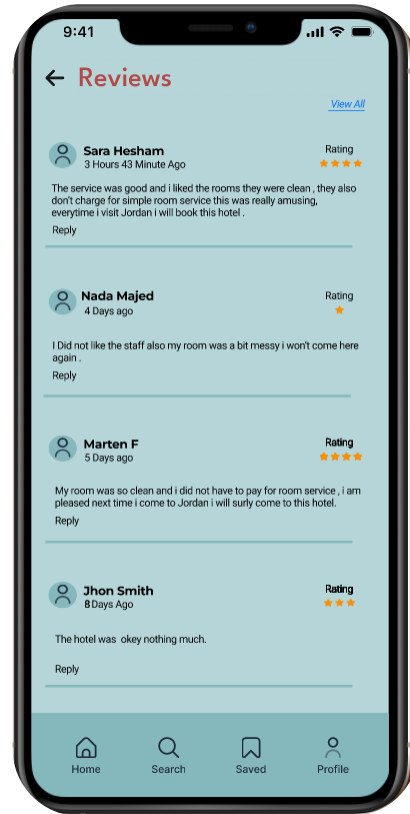
Figure 50: The Reviews Page Prototype
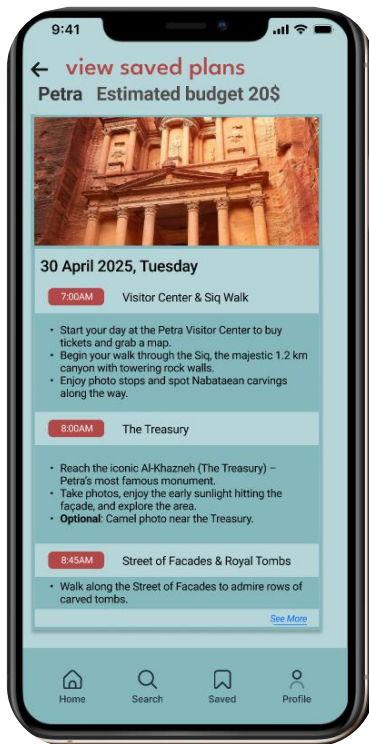
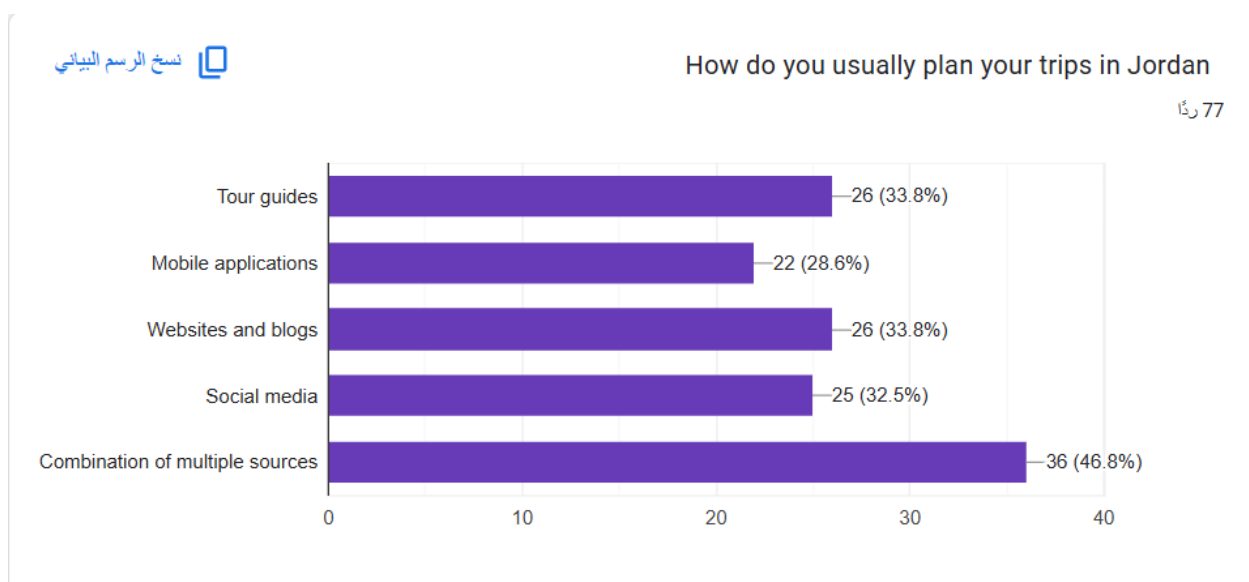*Figure 51: The Saved Itinerary Page Prototype*

Appendix

How do you usually plan your trips in Jordan

77 ردًا

Tour guides — 26 (33.8%)
Mobile applications — 22 (28.6%)
Websites and blogs — 26 (33.8%)
Social media — 25 (32.5%)
Combination of multiple sources — 36 (46.8%)

Figure 52: Questionnaire Question 1

نسخ الرسم البياني

How many different apps or websites do you typically use during your trip

77 ردًا

- 1–2
- 3–4
- More than 4

23.4%
50.6%
26%
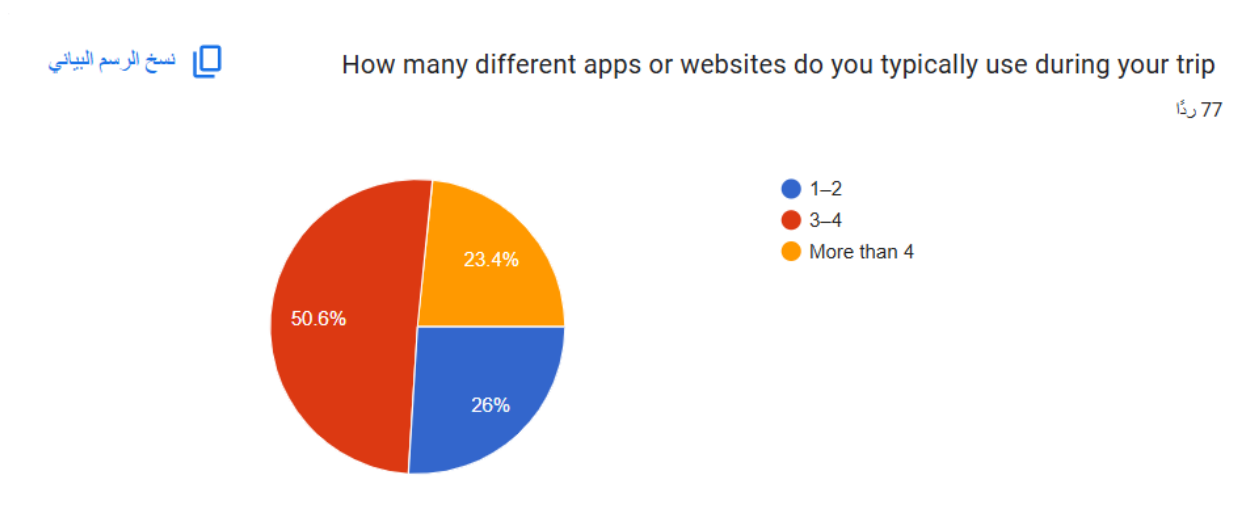
Figure 53: Questionnaire Question 2

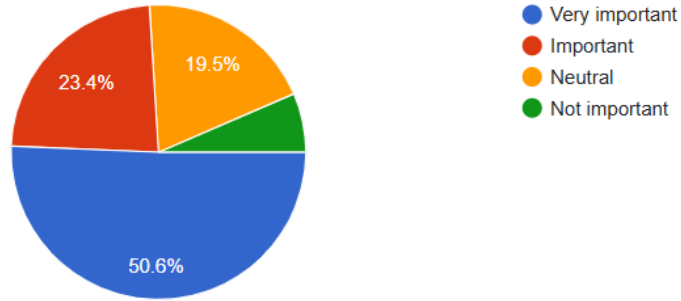How important is having a personalized itinerary based on your interests and trip duration

77 ردًا

- Very important
- Important
- Neutral
- Not important

19.5%
23.4%
50.6%

Figure 54:Questionnaire Question 3

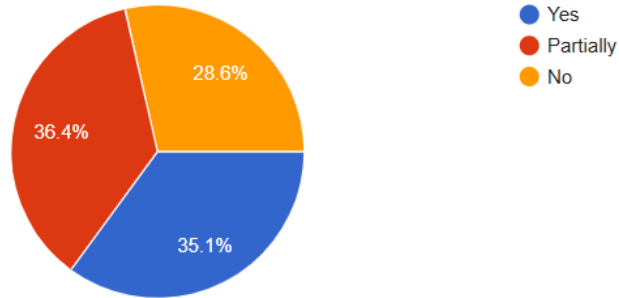Do existing travel applications provide itineraries that match your personal preferences

77 ردًا

- Yes
- Partially
- No

28.6%
36.4%
35.1%

Figure 55:Questionnaire Question 4

Would you use an AI-based system that generates a customized itinerary for your trip

77 ردًا

- Yes
- Partially
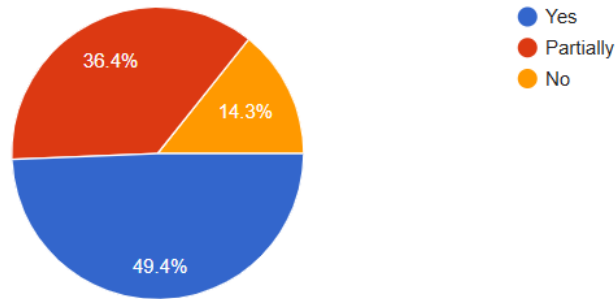- No

36.4%

14.3%

49.4%

Figure 56: Questionnaire Question 5

Have you experienced internet connectivity problems while traveling in Jordan

77 ردًا

- Often
- Sometimes
- Rarely
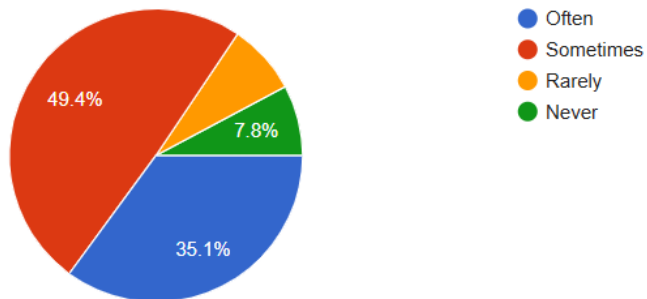- Never

49.4%

7.8%

35.1%

Figure 57: Questionnaire Question 6

How useful would offline maps be during your trip
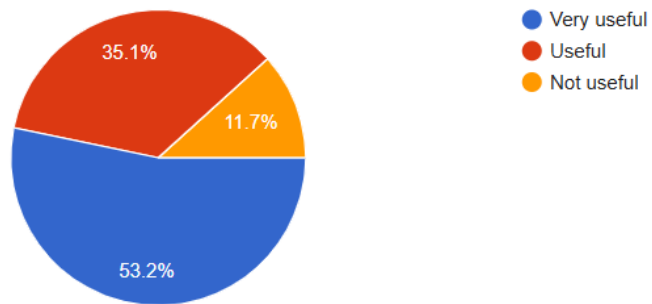
77 ردًا

- Very useful
- Useful
- Not useful

35.1%

11.7%

53.2%

Figure 58:Questionnaire Question 7

Do you prefer discovering local and family owned businesses over tourist focused places

77 ردًا

- Yes
- No
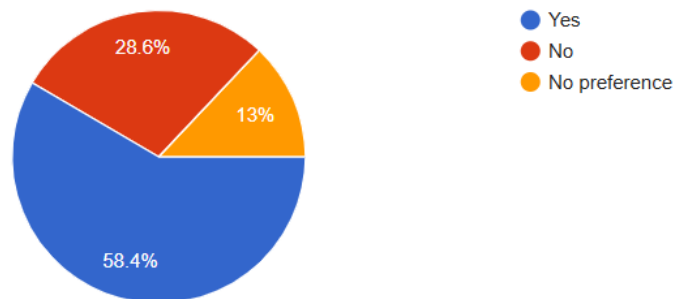- No preference

28.6%

13%

58.4%

Figure 59: Questionnaire Question 8

Would you trust AI-generated recommendations if they include real user reviews
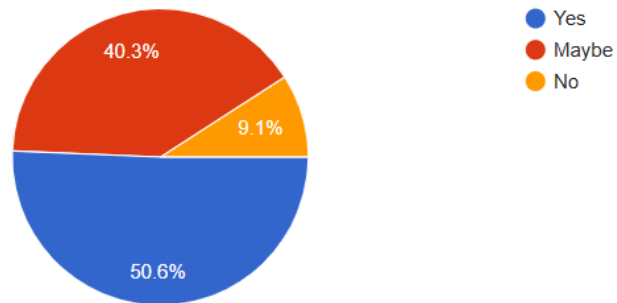
77 ردًا

- Yes
- Maybe
- No

40.3%

9.1%

50.6%

Figure 60: Questionnaire Question 9

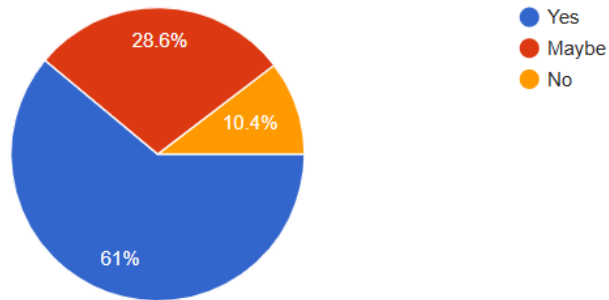Would you use a feature that allows you to save favorite locations and itineraries
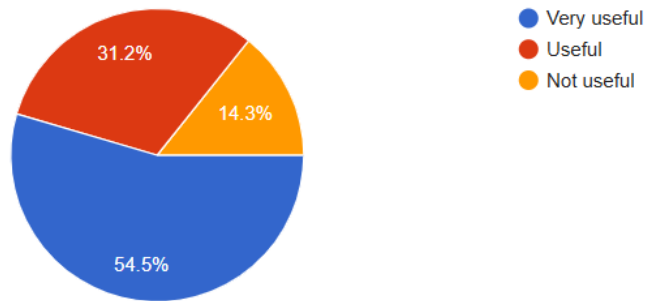
77 ردًا

- Yes
- Maybe
- No

28.6%

10.4%

61%

Figure 61: Questionnaire Question 10

How useful is sharing your trip plan with friends or family

77 ردًا

- Very useful
- Useful
- Not useful

31.2%

14.3%

54.5%

Figure 62: Questionnaire Question 11

Rank the following features based on importance to you when using a tourism app
(most important= 5 , least important = 1)

■ 1 ■ 2 ■ 3 ■ 4 ■ 5

Cultural tips and mergency information | Offline maps | Local restaurant and hotel recommendations | User reviews and ratings | Personalized itinerary planning
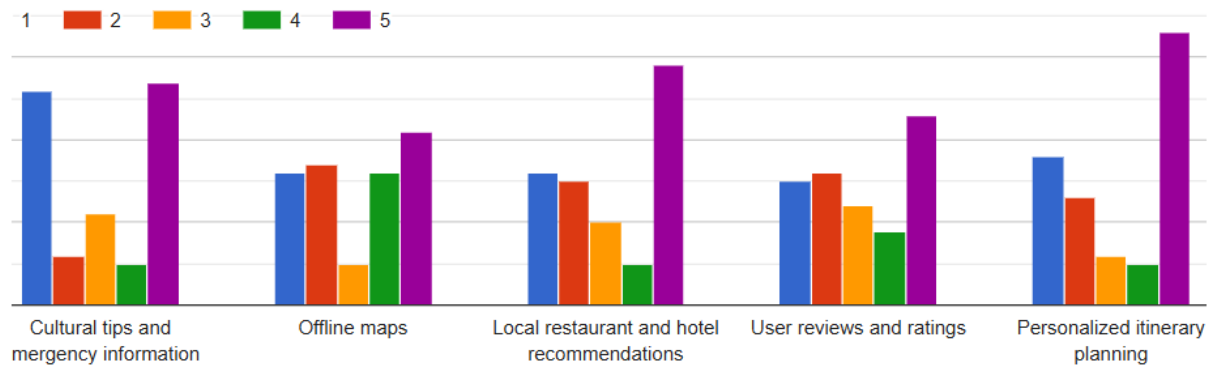
Figure 63: Questionnaire Question 12

How important is having cultural tips and etiquette information while traveling

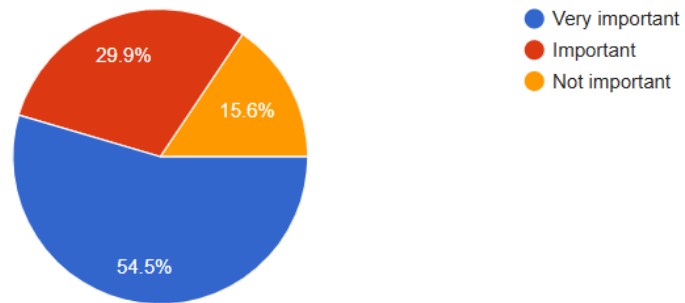77 ردًا

Legend:
- Very important
- Important
- Not important

29.9%
15.6%
54.5%

Figure 64: Questionnaire Question 13