

WanderPlan



By:

Abdullah Ahtsham

45679

Muhammad Nabeel Awais

43944

Muhammad Bilal Butt

44712

Supervised by:

Shehzad Ahmad Khan

Faculty of Computing

Riphaah International University, Islamabad

Fall 2025

A Dissertation Submitted To

Faculty of Computing,

Riphah International University, Islamabad

**As a Partial Fulfilment of the Requirement for the Award of
the Degree of**

Bachelor of Science in Software Engineering

Faculty of Computing

Riphah International University, Islamabad

Date: 05 January, 2026

Final Approval

This is to certify that we have read the report submitted by *Abdullah Ahtsham (45679)*, *Muhammad Nabeel Awais (43944)* and *Muhammad Bilal Butt (44712)* for the partial fulfillment of the requirements for the degree of the Bachelors of Science in Software Engineering (BSSE). It is our judgment that this report is of sufficient standard to warrant its acceptance by Riphah International University, Islamabad for the degree of Bachelors of Science in Software Engineering (BSSE).

Committee:

1

Shehzad Ahmad Khan

Supervisor

2

Dr. Musharraf Ahmad

Head of Department/chairman

Declaration

We hereby declare that this document “**WanderPlan**” neither as a whole nor as a part has been copied out from any source. It is further declared that we have done this project with the accompanied report entirely on the basis of our personal efforts, under the proficient guidance of our teachers especially our supervisor **Shehzad Ahmad Khan**. If any part of the system is proved to be copied out from any source or found to be reproduction of any project from anywhere else, we shall stand by the consequences.

Abdullah Ahtsham
45679

Muhammad Nabeel Awais
43944

Muhammad Bilal Butt
44712

Dedication

This work is dedicated first and foremost to our Creator,
the source of all knowledge, strength, and blessings—
the One who commands “Be,” and it is.
(Qur’an, 36:82).

We also want to express our sincere gratitude to our parents, whose sacrifices and
unwavering support have been the cornerstone of our success.
We sincerely dedicate this milestone to our supervisor, Shehzad Ahmad Khan, and
faculty members who supported, encouraged, and believed in us.

Acknowledgement

First of all we are obliged to Allah Almighty the Merciful, the Beneficent and the source of all Knowledge, for granting us the courage and knowledge to complete this Project.

We extend our deepest gratitude to our respected supervisor, Sir Shahzad Ahmad Khan, for his continuous guidance, valuable insights, and motivation throughout this journey. His mentorship played a vital role in shaping this project into its final form.

Abdullah Ahtsham

45679

Muhammad Nabeel Awais

43944

Muhammad Bilal Butt

44712

Abstract

WanderPlan is a mobile companion app that combines real-time navigation, local recommendations, and budget planning into one cohesive platform. The aim of this project is to help tourists manage their travel expenses efficiently while discovering authentic local food, attractions, and experiences — all within their defined budget.

WanderPlan's intelligent recommendation and budget management system provides an all-in-one solution, in contrast to current fragmented solutions that force users to rely on multiple applications for food discovery, lodging, map navigation as well as checking reviews. Using user-generated content (UGC) and location-based data, the system suggests the best and most genuine options while dynamically allocating a visitor's budget among lodging, travel, and dining. Additionally, the application features a community-driven review system that encourages participation and genuineness by allowing contributors to share their experiences and receive rewards. By enabling users to explore local restaurants, attractions, and bargains with clear cost and distance estimation, real-time mapping and navigation features improve usability.

WanderPlan's ultimate goal is to revolutionise traveler planning and experience by providing a comprehensive, effective, and user-focused travel management solution. The project uses technology for convenience, personalisation, and engagement while promoting accessible and culturally immersive travel.

Table Of Contents

| | |
|--|-------------------------------------|
| Chapter 1 | 10 |
| 1.1. OPPORTUNITY AND STAKEHOLDERS | 10 |
| 1.2. MOTIVATIONS AND CHALLENGES | 11 |
| 1.3. GOALS AND OBJECTIVES | 14 |
| 1.4. SOLUTION OVERVIEW | 16 |
| 1.5. REPORT OUTLINE | 17 |
| Chapter 2 | 21 |
| 2.1. INTRODUCTION | 21 |
| 2.2. LITERATURE REVIEW / TECHNOLOGIES OVERVIEW | 21 |
| 2.3. SUMMARY | 26 |
| Chapter 3 | 28 |
| 3.1. INTRODUCTION | 28 |
| 3.2. PROBLEM SCENARIOS | 28 |
| 3.3. FUNCTIONAL REQUIREMENT | 34 |
| 3.3.1. User (Tourists/Contributor) | 34 |
| 3.3.2. Business Owner | 36 |
| 3.4.1. Performance & Scalability | Error! Bookmark not defined. |
| 3.4.2. Availability & Reliability | Error! Bookmark not defined. |
| 3.4.3. Usability & Accessibility | Error! Bookmark not defined. |
| 3.4.5. Maintainability | Error! Bookmark not defined. |
| Chapter 4 | 42 |
| 4.1. INTRODUCTION | 42 |
| 4.2. ARCHITECTURAL DESIGN | 42 |
| 4.3. DETAILED DESIGN | 43 |
| 4.3.1. Use Case Diagrams | 43 |
| 4.3.1.1. Authentication Use Case Diagram | 43 |
| 4.3.1.2. Dashboard Use Case Diagram | 44 |
| 4.3.1.3. Recommendation & Discovery Use Case Diagram | 45 |
| 4.3.1.4. Reviews & UGC Use Case Diagram | 46 |
| 4.3.1.5. Trip & Budget Planning Use Case Diagram | 47 |
| 4.3.1.6. Profile Use Case Diagram | 48 |
| 4.3.2. Fully Dressed Use Cases | 50 |
| 4.3.3. Activity Diagrams | 70 |
| 4.5. SQA ACTIVITIES: DEFECT DETECTION | 74 |

Chapter: 1

INTRODUCTION

Chapter 1

INTRODUCTION

WanderPlan is an intelligent, user-centric travel assistance platform designed to make travel easier for tourists, particularly when visiting new places. The system assists users in making secure travel choices that fit their taste and budget by integrating a contributor-driven review ecosystem, location based recommendations, an interactive map interface as well as a dynamic budget engine. WanderPlan offers a dedicated web-based business dashboard in addition to its mobile application for the tourists and contributors. This dashboard allows local attractions, hotels, and restaurants to post deals, manage listings, create profiles, and track customer engagement. In order to synchronise menus, pricing, availability, and promotional data for more precise app recommendations, businesses with existing point-of-sale systems can choose to integrate them. WanderPlan makes travel easier, boosts local visibility, and fosters a more informed, pleasurable, and customised travel experience by bringing together travellers, local contributors, and businesses under a single digital ecosystem.

1.1. OPPORTUNITY AND STAKEHOLDERS

The global travel and tourism industry continues to grow rapidly, driven by advancements in digital technologies and increased accessibility of information. The modern traveler seeks convenience, personalization, and efficiency. Travellers anticipate smart, integrated tools that simplify their trip, whether it is - selecting the ideal location, controlling travel costs, or identifying the greatest dining establishments. Despite this need, the majority of applications in the travel ecosystem are still dispersed; some concentrate only on budgeting, while others concentrate on reviews and navigation. Users are forced to juggle multiple applications during a single trip due to this lack of integration, which results in inefficiencies.

By providing a unified mobile platform that combines trip budgeting, food and lodging suggestions, maps, reviews, and gamified user interaction, our project,

WanderPlan, fills this gap. By introducing a data-driven and AI-powered approach to trip management, it lessens users' cognitive load and makes smarter travel planning possible.

1.1.1. Stakeholders

A wide range of stakeholders are involved in WanderPlan:

- User.
- Business Owners.
- Admin.

1.2. MOTIVATIONS AND CHALLENGES

1.2.1. Motivation

The growing demand for more intelligent, individualised, and easily accessible travel planning tools led to the creation of WanderPlan. Travellers still have to deal with disorganised information, shaky reviews, inconsistent prices, and an overwhelming range of options in a world where tourism is growing and digital platforms are changing how people discover new places. Our goal is to make travel planning easier by developing a centralised platform that uses real business data and community contributions to intelligently create trip plans, manage budgets, and offer reliable recommendations.

1.2.1.1. Problem Relevance

Based on our interviews with Mr. Ahmad and several other people who travel primarily on their own, tourism is currently in the spotlight. Due to unexpected expenditures and a lack of local knowledge, we discovered that managing a budget is the most challenging aspect of travelling. This is a waste of money and results in a poor tour experience.

1.2.1.2. Team Motivation

As software engineering students, we were motivated by the challenge of building a real-world system that merges multiple technical layers - budget algorithms,

recommendation engines, dynamic mapping, user-generated content, and a business-facing dashboard.

We can put the principles of system design, mobile development, API integrations, security, and user experience design into practice with this project. We chose this domain because it is both technically diverse and socially impactful, offering significant learning in problem-solving and innovation.

1.2.1.3. Community Impact

WanderPlan could have a beneficial impact on numerous aspects of society. Better planning, cost transparency, and real peer-driven insights are all beneficial to tourists.

Local contributors gain a platform to share their experiences and earn rewards, fostering a sense of community ownership. Owners of businesses, particularly independent and small ones, benefit from increased visibility, improved outreach, and analytics that help them comprehend consumer behaviour.

Long-term, such a platform can help local tourism economies, advertise lesser-known destinations, and facilitate data-driven enhancements to travel and hospitality offerings.

1.2.2. Challenges

We had to overcome a number of operational, technical, and team-building obstacles in order to develop WanderPlan. These challenges put our ability to solve problems to the test and influenced how we approached the project.

1.2.2.1. Technical Complexity

WanderPlan combines a number of complex components, including business dashboards, backend APIs, mapping services, recommendation logic, mobile development, and user-generated content workflows. During early development, it was difficult to handle real-time data, ensure seamless communication between these layers, and preserve performance on low-end devices.

1.2.2.2. Resource Limitations

There was limited access to reliable internet, high-performance systems, and paid APIs (like map services or Google Distance Matrix). This slowed down integration cycles and limited how often build pipelines could be tested. Maintaining usage limits while working with free tiers also required careful optimisation.

1.2.2.3. Time Management

One of the biggest challenges was juggling project deadlines, semester projects, coursework and job. Consistent planning and prioritisation were necessary to prevent delays in coordinating development timelines, particularly between frontend, backend, and documentation processes.

1.2.2.4. Learning and Skill Gaps

A number of new technologies were introduced by the project, including data scraping, mapping services, backend API integration, mobile UI/UX design, and business dashboard design. A steep learning curve was introduced by comprehending these technologies as well as best practices for database structuring, clean architecture, and authentication.

1.2.2.5. Lessons Learned

We came to understand that successful completion of a large-scale project requires clear module ownership, early planning, and effective communication. In software development, technical difficulties are inevitable, but progress is fuelled by constant coordination and a readiness to modify the plan.

1.2.2.6. Future Recommendations

Future teams should plan frequent check-ins, adhere to stringent version control, and complete the core architecture as soon as possible. Setting reasonable goals and conducting early prototype testing can greatly lower stress levels and avoid rework in later phases.

1.2.3. Conclusion

WanderPlan was created in response to the increasing demand for a single, dependable, and easy-to-use platform that assists tourists in organising their travels, controlling their spending, and finding genuine experiences. However, the logistical, technical, and teamwork challenges we encountered changed our strategy and improved our problem-solving skills. These insights clarified things, enhanced our

performance, and equipped us to create a system that is useful, scalable, and beneficial to all users.

1.3. GOALS AND OBJECTIVES

Our objective is to offer a solution that will significantly help those who are worried about the financial difficulties that arise when travelling throughout Pakistan.

1.3.1. Introduction

WanderPlan aims to address the common difficulties faced by modern travelers who struggle to manage budgets, discover trustworthy recommendations, and plan trips efficiently. Without incorporating real-time prices, user-generated insights, or local recommendations, the majority of current platforms either concentrate on high-level travel inspiration or offer limited budget management. Similar to this, local businesses and contributors do not have a single online presence where they can advertise services, share updates, and interact meaningfully with visitors.

1.3.2. Overall Goal

WanderPlan's main objective is to develop an intelligent, cost-effective travel companion that, through a single mobile application, assists travellers in creating the best possible travel plans, finding suggested destinations, navigating quickly, and accessing real, community-driven insights.

Furthermore, the system offers:

- A single user platform that brings together the functionalities for travelers to plan their trips, control their expenses, find new places, and post genuine reviews or contributions in exchange for rewards and profile levels.
- A cloud-based business dashboard for restaurants, hotels, and sightseeing spot that helps them in managing verified profiles, announcing deals, replying to reviews.
- An admin control panel that checks business registrations, tracks platform activity, moderates content, and guarantees data quality, security, and smooth system operations.

1.3.3. Rationale

WanderPlan's justification is based on multiple factors:

- Unpredictable local prices, erroneous internet advice, and dispersed information frequently cause tourists to overspend or experience inconvenience.
- Despite having the most genuine knowledge of locations, cuisine, activities, and hidden treasures, local contributors are not as well-known.
- Without investing in extensive marketing channels, businesses find it difficult to engage tourists, advertise deals, and maintain an online presence.

WanderPlan fills these gaps by creating a system that distributes budgets intelligently, gathers reliable local data, and enables companies to communicate with users directly. This guarantees a travel experience that is more knowledgeable, open, and community-driven.

1.3.4. Timeline

In the Part I of our FYP, we are determined to complete the documentation of the first 4 chapters of our report and make a functional mobile application that has the base functionality implemented necessary for the further development of our application.

All the frontend of the application as well as the Business Portal would be completed and the basic backend would also be included in Part I.

By the grace of Allah (S.W.T.), we hope to finish the remaining documentation and incorporate all of the key features that make up the entire WanderPlan experience in the second phase. This comprises the dynamic budget engine, the recommendation system, the reviews and user-generated content module, the maps and navigation features, the profile and rewards system. To guarantee system dependability and seamless operation, we will also conduct thorough testing, including unit, integration, and end-to-end. Our goals for this phase are to successfully launch the mobile application's beta version and backend services, complete all documentation, and get the system ready for the last demonstration and assessment.

1.3.5. Success Criteria

Stakeholders will establish the success criteria if the entire solution is developed weeks prior to our part two presentation. Otherwise, by concentrating on the issues that have been identified and evaluating the effectiveness of the implemented solution, we can assess our own success criteria.

1.3.6. Conclusion

As a result, WanderPlan's main goal is to make travel planning and experience easier, better, and more modern by offering a centralised mobile platform backed by community-driven insights and intelligent automation.

1.4. SOLUTION OVERVIEW

When considering the difficulties travellers encounter in finding genuine experiences, controlling spending, and locating reliable local information, there are a number of crucial areas where enhancements can greatly improve their travel experience. WanderPlan uses the following focused solutions to close these gaps:

1.4.1. Personalized Trip Budgeting

Travel budgeting frequently becomes too much to handle, particularly when costs differ for lodging, food, and transportation. By providing a dynamic budgeting system that allocates spending intelligently and transparently, WanderPlan streamlines this process and enables travellers to plan within their constraints without sacrificing their experience.

1.4.2. Intelligent Recommendations and Local Discovery

Tourists frequently rely on scattered sources for food, attractions, and activities. WanderPlan brings these elements together by providing tailored recommendations based on real-time trends, user budgets, and authentic local insights. This helps travelers explore both popular spots and hidden gems with confidence and ease.

1.4.3. Integrated Maps and Real-Time Cost Estimation

Without precise cost and route information, navigating a new city can be challenging. With WanderPlan, travellers can quickly make well-informed decisions by combining map navigation with travel-cost and distance estimation. This reduces unforeseen costs and guarantees more seamless movement on the ground.

1.4.4. Community-Driven Reviews

Because of inaccurate or out-of-date information, it can be challenging to find trustworthy reviews. In order to address this, WanderPlan developed an ecosystem driven by contributors in which residents and visitors exchange current reviews, images, and experiences. The interactive feed guarantees that users receive authentic, context-rich insights and increases transparency.

1.4.5. Business Engagement and Deals Visibility

Travellers may lose out on promotions, discounts, or relevant products just because companies aren't properly visible online. Restaurants, cafés, hotels, and other local vendors can display menus, promotions, and real-time updates on WanderPlan's web-based business dashboard. Travellers can instantly obtain reliable information through targeted deals and business profiles.

1.4.6. Gamification and Contributor Rewards

Although it is frequently overlooked, encouraging users to share reviews and insights is crucial for a healthy ecosystem. Through gamification—reward points, contributor badges, and discount coupons—WanderPlan increases user engagement and encourages active participation and ongoing platform enhancement.

1.4.7. Enhanced Experience Through Unified Ecosystem

Instead of juggling multiple apps for budgeting, food, travel, and reviews, WanderPlan brings every essential feature under one intelligent, easy-to-navigate platform. This unified experience ensures seamless planning, informed choices, authentic interactions, and better resource utilization throughout the trip.

1.5. REPORT OUTLINE

1.5.1. Chapter 1: Introduction

The WanderPlan project's foundation is presented in this chapter, along with opportunities that have been identified, key stakeholders, the idea's motivations, and the main obstacles encountered during development. Along with outlining the project's goals and objectives, it provides a high-level summary of the suggested solution, emphasising the key components of the business dashboard and mobile application.

1.5.2. Chapter 2: Literature / Market Survey

This chapter examines existing travel applications and digital tourism solutions, analyzing the functionalities they offer and identifying the core gaps in budget planning, real-time information accuracy, personalized recommendations, and business digitalization. It also explains the tools, technologies, and research methodologies that guide the development of WanderPlan.

1.5.3. Chapter 3: Requirement Engineering

Chapter 3 details the functional and non-functional requirements of the WanderPlan system. It describes the requirement elicitation techniques used—such as interviews, market study, and competitor analysis—and includes identified system constraints. Test case-based defect detection is also incorporated to validate requirement completeness and correctness.

1.5.4. Chapter 4: System Design

This chapter presents the architectural framework of WanderPlan, covering system architecture diagrams, detailed use cases, activity diagrams, sequence diagrams, ERD, and the database schema. It also includes component diagrams and discusses how the design supports scalability, modularity, and integration between the mobile application and business dashboard.

1.5.5. Chapter 5: Implementation

This chapter explains the implementation phase, including work breakdown structure (WBS), roles and responsibilities of team members, development tools and technologies, and code structuring standards. It also includes backend API development, frontend implementation details (mobile + dashboard), and deployment

environment setup. White-box testing and defect detection practices are documented as well.

1.5.6. Chapter 6: Testing & Evaluation

The system's validation is the main topic of Chapter 6. It contains thorough test cases covering both functional and non-functional requirements for every feature of the WanderPlan business dashboard and mobile application. To illustrate dependability and performance, the findings, assessments, and defect fixes are also covered.

1.5.7. Chapter 7: Conclusion & Outlook

This chapter highlights WanderPlan's accomplishments while considering how the project resolves the issues that have been identified. Along with highlighting its weaknesses, it offers suggestions for the future, such as the incorporation of halal/haram food filtering, AI-driven dynamic schedules, expanded Plugin features, and additional improvements to boost platform utility and user experience.

Chapter: 2

LITERATURE / MARKET

SURVEY

Chapter 2

MARKET SURVEY

2.1. INTRODUCTION

These days, there are numerous apps for travel planning, including ones for budgeting, dining, locations, and navigation. Because of this, tourists find the process confusing, time-consuming, and challenging to handle. Current budget, food, and travel apps function well on their own, but they don't provide a cohesive and customised experience.

In order to fill this gap, WanderPlan provides travellers with an all-in-one platform that allows them to plan trips, manage budgets, look through recommendations, navigate locations, read real reviews, and interact with local businesses and contributors. In order to comprehend current solutions and pinpoint the issues that WanderPlan seeks to address, this chapter examines apps that are currently available in these categories.

2.2. LITERATURE REVIEW / TECHNOLOGIES OVERVIEW

2.2.1. Historical Context

Over the past ten years, digital travel solutions have changed dramatically. Travel agencies, manual research, and guidebooks were the first resources used by tourists. These manual processes were eventually supplanted by programs like Google Maps, TripAdvisor, and budgeting tools. However, rather than developing as an unified system, budgeting, suggestions, and discovery tools continued to develop independently.

SplitWise and TrabeePocket are budgeting apps that only track expenses. While food delivery services like FoodPanda made dining more accessible, they lacked travel-related insights. Yelp and TripAdvisor are examples of review sites that prioritise community feedback over a traveler's budget or specific trip requirements. Although

navigation apps offered precise routes, they did not offer recommendations for contextual travel.

The fragmentation of the digital travel industry creates a significant need for a single system, which WanderPlan seeks to fill.

2.2.2. Key Concepts & Theories

Travel planning in the modern era is largely dependent on digital support, where ideas like location-based services, user-generated content, personalised recommendations, and budget optimisation are crucial. The goal of budget optimisation is to assist travellers in effectively allocating their spending according to constraints and preferences. Recommendation systems make recommendations for restaurants, attractions, and lodging based on user behaviour and data patterns. By offering actual traveler experiences, opinions, and insights, user-generated content enhances authenticity. Furthermore, real-time navigation and context-aware recommendations are made possible by location-based services, which are backed by mapping technologies and distance estimation algorithms. Together, these ideas inform WanderPlan's design, guaranteeing a smooth and wise travel experience.

2.2.3. Related Work

We looked at applications in a variety of categories to assess WanderPlan's applicability and necessity:

1. Budget Apps:

- SplitWise does not help with planning or destination discovery, but it does manage group-based expense splitting.
- TrabeePocket is good at keeping track of travel expenses, but it doesn't have review or recommendation systems.
- Wallet prioritises tracking finances over budgeting for individual trips.

2. Food Apps:

- FoodPanda is great for placing food orders, but it's not made for organising or exploring travel.
- Yelp and Restaurant Finder provide ratings and reviews, but they don't take budget preferences or travel routes into account.

3. Travel & Trip Apps:

- TripAdvisor is good at reviews but poor at personalised planning and budgeting.
- Google Travel is useful for general planning, but it doesn't offer personalised regional recommendations or social interaction.
- Airbnb Experiences does not plan the entire trip; it only concentrates on activities.

They Lack:

- i. No single app for both trip planning and budgeting
- ii. No intelligent suggestions powered by AI
- iii. Restricted customised navigation-based exploration
- iv. Absence of a reward-based, integrated contributor ecosystem
- v. No business dashboard
- vi. Absence of regional, local insights specific to Pakistan's tourism culture

WanderPlan addresses these missing components.

2.2.4. Technologies Overview

WanderPlan uses a variety of contemporary technologies to enable real-time travel assistance. Cross-platform frameworks for mobile development, like React Native, make it possible for visitors and contributors to have a seamless and responsive user interface. Node.js and Express power the backend, handling REST APIs for business dashboards, recommendations, budget processing, and authentication. Database like MongoDB are used to manage and store structured and media-rich data.

2.3. EXISTING SYSTEMS

2.3.1. SplitWise

- A well-known app for splitting expenses.
- Excellent for travelling in groups.
- lacks navigation, suggestions, and trip planning.

2.3.2. Trabee Pocket

- Designed with travel budgeting in mind.
- Excellent user interface for cost breakdowns.
- Does not create plans or link users to dining establishments or events.

2.3.3. Wallet

- An app for tracking finances.
- Not related to travel.
- Absence of map integrations or discovery.

2.3.4. FoodPanda

- Strong food exploration in large cities.
- No suggestions based on travel.
- Unrelated to travel arrangements.

2.3.5. Restaurant Finder / Yelp

- Platforms that rely on reviews.
- Wide-ranging but not specifically tailored to Pakistan.
- Absence of integrated trip flows or budget estimation.

2.3.6. Trip Advisor

- Excellent for reviews.

- Inadequate for creating a budget.
- Pakistan's limited local insights.

2.3.7. Airbnb Experiences

- Offers carefully chosen experiences.
- Not related to navigation or budget planning.
- Not accessible everywhere in Pakistan.

2.3.8. Google Travel

- Excellent automated recommendations.
- Does not provide engagement with local contributors.
- No vendor business dashboard.

2.3.9. Survey Table

A simplified comparison of the studied systems is shown in **Table 2.1.** :

| Application | Budgeting | Recommendations | Navigation | Reviews | Business Dashboard |
|--------------------------------|---------------------|------------------------|-------------------|----------------|---------------------------|
| Split Wise | Partially Available | Not Available | Not Available | Not Available | Not Available |
| Trabee Pocket | Available | Not Available | Not Available | Not Available | Not Available |
| Wallet | Available | Not Available | Not Available | Not Available | Not Available |
| FoodPanda | Not Available | Available | Not Available | Available | Not Available |
| Restaurant Finder/ Yelp | Not Available | Available | Not Available | Available | Not Available |

| | | | | | |
|----------------------|---------------|-----------|---------------|-----------|---------------|
| TripAdvisor | Not Available | Available | Not Available | Available | Not Available |
| Google Travel | Not Available | Available | Available | Available | Not Available |
| Airbnb Exp. | Not Available | Available | Not Available | Available | Not Available |

Table 2.1. Market Survey Table

2.4. SUMMARY

This chapter examined the state of travel planning solutions today and emphasised the shortcomings in local business integration, recommendations, reviews, budgeting, and navigation. Although a number of apps cover different facets of the travel experience, none offer a single, cost-effective solution. These results lay the groundwork for the discussion of the system's specific functional and non-functional requirements in the following chapter.

Chapter: 3

REQUIREMENT ENGINEERING

Chapter 3

REQUIREMENT ENGINEERING

3.1. INTRODUCTION

This chapter will discuss the stakeholders' current issues, how we collected the requirements, and what those requirements were (both functional and nonfunctional).

3.2. PROBLEM SCENARIOS

The main problem statements found for WanderPlan are detailed in the following tables (Table 3.1 to Table 3.5). Stakeholder interviews, surveys, competitor analysis, and gap identification in tourism, navigation, budgeting, and local food discovery applications were used to create these problem scenarios.

| 3.2.1. Problem Statement 1: Budget Planning Difficulty | |
|---|--|
| The Problem | Travellers are unable to properly plan and manage their trip budgets. |
| Affects | Tourists |
| The Result of which | <ul style="list-style-type: none">• The challenge of creating practical routes.• Time lost flipping between several apps for activity costs, accomodation fares and food prices.• Inaccurate budget expectations led to a bad trip.• Unintentionally, tourists overspend or underspend. |

| | |
|--------------------|--|
| Benefits of | <ul style="list-style-type: none"> • Automatically created spending plan for lodging, travel, and meals. • Realistic travel schedules derived from local and real-time data. • A clear breakdown of costs to prevent unforeseen costs. • Enhanced confidence in planning and financial management. |
|--------------------|--|

| | |
|---|---|
| 3.2.2. Problem Statement 2: Unreliable Recommendations | |
| The Problem | The majority of apps display generic or sponsored listings, making it challenging for travellers to obtain reliable, local, and reasonably priced recommendations. |
| Affects | Tourists, Contributors |
| The Result of which | <ul style="list-style-type: none"> • Tourists end up at overprices or overrated places. • Finding undiscovered local treasures is challenging. • There is no platform that allows contributors to highlight their local expertise. • Travellers rely on inaccurate or out-of-date internet information. |
| Benefits of | <ul style="list-style-type: none"> • Travellers receive trustworthy, neighborhood-based recommendations. • Local contributors are recognised for their genuine recommendations. • Genuine quality businesses gain from genuine reviews rather than sponsored placements. • A more budget-friendly discovery experience. |

| 3.2.3. Problem Statement 3: Navigation And Travel Cost | |
|---|--|
| The Problem | Tourists cannot accurately estimate transportation costs, distances, or directions, especially in unfamiliar cities where prices vary widely. |
| Affects | Tourists |
| The Result of which | <ul style="list-style-type: none"> • Transport services overcharge tourists. • Unknown distances lead to poor trip planning. • Navigating between locations wastes time. • Fear and confusion in strange places. |
| Benefits of | <ul style="list-style-type: none"> • Precise fare and distance estimates prior to travel. • Clearly defined routes and options. • A visual map of nearby recommendations. • Tourists will feel more confident and have safer mobility. |

| 3.2.4. Problem Statement 4: Untrustworthy Reviews | |
|--|--|
| The Problem | Existing review platforms often contain outdated, fake, or paid reviews, making it difficult to trust community feedback. |
| Affects | Tourists, Contributors, Business Owners |
| The Result of which | <ul style="list-style-type: none"> • Inaccurate reviews cause tourists to make bad choices. • Authentic knowledge is not acknowledged or compensated for by local contributors. • It is difficult for businesses to gain the trust of real customers. • There are few options for reporting, filtering, and engaging with reviews. |

| | |
|--------------------|--|
| Benefits of | <ul style="list-style-type: none"> • An open and interactive review feed. • Local donors who make significant contributions are rewarded. • Gamification promotes involvement. • Companies can improve trust by responding to reviews. |
|--------------------|--|

| | |
|---|---|
| 3.2.5. Problem Statement 5: Lack of Exposure & Tools to Reach Tourists | |
| The Problem | Many restaurants, hotels, and nearby attractions don't have the digital presence or resources necessary to advertise sales, reply to reviews, or track consumer interaction. |
| Affects | Business Owners |
| The Result of which | <ul style="list-style-type: none"> • Businesses rely solely on walk-in clients. • There are no tools to advertise sales to specific audiences. • No analytics to identify patterns or visitor behaviour. • Insufficient customer communication. |
| Benefits of | <ul style="list-style-type: none"> • A specific business dashboard for managing profiles. • The capacity to post sponsored listings, deals, and advertisements. • Perceptive data derived from user visits and review patterns. • Increased visibility and interaction with visitors. |

3.3. ELICITATION TECHNIQUES

To comprehend the necessities, anticipations, and difficulties of the participants in the WanderPlan project, elicitation techniques were used. These techniques helped in verifying the system's practicability, revealing actual user's issues, and establishing the requirements of the system through genuine feedback rather than guesswork. The undermentioned means were utilized in the course of the requirement elicitation period:

3.3.1. Interview

Structured interviews were organized with various stakeholders, comprising of regular travelers, local entrepreneurs, and tourist lovers in the city. The main issues pointed out by the interviews can be acknowledged through the below given Table.

| MEETING RECORDS | | | | | | | |
|-----------------|------------|--------------|---------------------------|------------------------|--|--|------------------|
| Sr # | Date | Name | Role | Location | Purpose | Outcomes | Aligns with Goal |
| 01 | 25-09-2025 | Bilal Ahmed | Local Food Business Owner | Saddar, Rawalpindi | Understand business onboarding needs | Wants visibility to nearby travelers, Can manage a simple dashboard. | Yes |
| 02 | 09-10-2025 | Ruman Bashir | Student Traveler | I-14 Markaz, Islamabad | Identify pain-points in planning trips & budgeting | Uses multiple apps for food, maps, booking, and reviews. | Yes |

| | | | | | | | |
|----|------------|--------------|---------------------|----------------------------|---|--|--|
| 03 | 11-10-2025 | Mr. Imran | Travel Agency Owner | Kohinoor Mills, Rawalpindi | Identification of pain points, requirement gathering from travel agency perspective | Suggested that WanderPlan should work as a complete ticketing and tour-booking platform. | No, Because WanderPlan concerns itself with aspects such as trip planning, budgeting, recommendations, and user-generated content and is non-operational in this case. |
| 04 | 15-10-2025 | Abdul rehman | Travel Blogger | Chour Chowk, Rawalpindi | Gather some insights on the review and content contributions | Wants reward-based contribution, profile levels, and protected moderation against fake reviews. | Yes |
| 05 | 19-10-2025 | Mehroz Bilal | Frequent Traveler | Kohinoor Mills, Rawalpindi | Validate AI-based budget module usefulness | Likes the idea of AI-generated budget plans, but insists estimates should be transparent & editable. | Yes |

3.3.2. Observation

The observation of travelers in an informal way and their interaction with modern travel platforms revealed numerous problems related to usability and trust. Moreover, we saw how local businesses marketed themselves and handled their customers. These observations revealed shortcomings like biased or promotional rankings, a lack of genuine reviews, and the difficulty in obtaining localized recommendations.

3.3.3. Brainstorming

The team held several brainstorming sessions to merge the feedback from stakeholders and turn it into organized system requirements. Besides, such discussions pointed us to the ways out, helped us to check features against actual needs, and led us to the decision on the top functionalities like AI-based trip budgeting, trustworthy recommendations, and user rewards based on contributions.

3.3.4. Justification for Elicitation Technique

Interviews combined with observations and brainstorming led to the user-centered, validated, practical, and technically feasible requirements. The techniques adopted made it possible for us to gain a clear insight into stakeholder expectations and thereby convert them into the measurable and relevant system requirements for WanderPlan.

3.4. FUNCTIONAL REQUIREMENT

Definition: Functional requirements outline the precise tasks that the WanderPlan system must complete, including inputs, behaviours, and outputs. These specifications outline the key components, including computations, data processing, user interactions, and system reactions.

Note: The list does not include implied constraints like input validation. The requirements listed below are ranked by stakeholder value and priority; the use case ID is indicated by the numbers in square brackets.

3.4.1. User (Tourists/Contributor)

A single unified user role. The same account can be used both for traveling and for contributing reviews.

3.3.1.1 Dashboard & Home

- The user shall be displayed with the unified home page after login. UC-01
- The dashboard shall show personalized recommendations. UC-02
- The user shall be able to navigate to Trips, Reviews, Maps, Profile.
- The user shall be able to view notifications. UC-03

3.3.1.2. Trip & Budget Management

- The user shall be able to create a trip budget.
- The user shall be able to input budget preferences (travel mode, group size, destination, stay duration).
- The user shall generate a suggested trip plan based on user inputs.
- The user shall be able to edit or customize a generated plan.
- The user shall be able to manually create a custom trip.
- The user shall be able to save trip plans.
- The user shall be able to track previous trip histories.

3.3.1.3. Recommendations & Discovery

- The user shall be able to view recommended restaurants, hotels, and attractions.
- The user shall be able to filter recommendations by distance, rating, and price.
- The user shall be able to open detailed pages for places.
- The user shall be able to view deals and sponsored ads submitted by businesses.

3.3.1.4. Maps & Navigation

- The user shall be able to search for destinations via map.
- The user shall be able to view routes and directions.
- The system shall display estimated travel cost and distance.
- The user shall be able to view nearby recommendations.

3.3.1.5. Reviews

- The user shall be able to create a review.
- The user shall be able to upload media (images) in a review.
- The user shall be able to edit or delete their existing reviews.
- The user shall be able to like, comment and react to reviews.
- The user shall be able to report inappropriate content.

3.3.1.6. Profile & Leveling System

- The user's profile shall show personal details and activity statistics.
- The system shall automatically assign Tourist Level based on the trip activity.
- The system shall automatically assign Reviewer Level based on the contribution.
- The user shall be able to edit their personal details.
- The user shall be able to view earned rewards or coupons.

3.4.2. Business Owner

A separate web dashboard for restaurants, hotels, and local service providers.

3.3.2.1. Business Registration & Setup

- The business owner shall be able to register a business account.
- The business owner shall be able to create a business profile.
- The business owner shall be able to update business details, such as:
Name, Category, Menu/services, Price range, Location, Operating hours.

3.3.2.2. Deals & Ads Management

- The business owner shall be able to create deals/promotions.
- The business owner shall be able to manage active/inactive deals.
- The business owner shall be able to promote ads within the app.

3.3.2.3. Review Interaction

- The business owners shall be able to view reviews posted about their business.
- The business owners shall be able to reply to reviews.
- The business owner shall be able to report fake or harmful reviews.

3.3.2.4. Analytics Dashboard

- The business owner shall be able to view analytics such as:

- i. Customer visits.
- ii. Engagement.
- iii. Review Trends.
- iv. Popular Menu items/Services.

3.4.3. Admin

A separate admin dashboard for management and verification of businesses as well as the content.

3.4.3.1. Business Management & Verification

- The Admin shall be able to view newly registered business profiles.
- The Admin shall be able to verify business documents and details.
- The Admin shall be able to approve or reject business accounts.
- The Admin shall be able to Suspend or Reactivate the business account.
- The Admin shall be able to resolve-business-related queries.

3.4.3.2. Content Moderation

- The Admin shall be able to review user reviews & ratings.
- The Admin shall be able to remove inappropriate or false content.
- The Admin shall be able to monitor reported reviews.
- The Admin shall be able to handle spam or abusive content.
- The Admin shall be able to track repeat offenders.
- The Admin shall be able to maintain moderation logs.

3.4.3.3. Reports & Complaints Handling

- The Admin shall be able to view all user-submitted reports.
- The Admin shall be able to categorize complaints (Business / User).
- The Admin shall be able to assign priority level.
- The Admin shall be able to take corrective action (warn / suspend / delete).
- The Admin shall be able to maintain resolutions history.

3.4.3.4. System & Access Control

- The Admin shall be able to authenticate login .
- The Admin shall be able to manage admin roles & permissions.
- The Admin shall be able to log admin activities (audit trail).
- The Admin shall be able to session monitoring.
- The Admin shall be able to view security & risk alerts.

3.4.3.5. Analytics & Monitoring

- The Admin shall be able to view review engagement statistics.
- The Admin shall be able to monitor business onboarding.
- The Admin shall be able to view review trends & patterns.

3.5. NON-FUNCTIONAL REQUIREMENTS

Non-functional requirements set forth the quality benchmarks and limitations within which WanderPlan is supposed to function. Among the mentioned characteristics are the performance, reliability, security, usability, maintainability, and so on, which affect the overall quality of the system rather than its functionality. Thus, such requirements make the application steady, seamless, and trustworthy for travelers, contributors, businesses, and the administration.

3.5.1. Performance Requirements (Quantitative)

WanderPlan must provide a smooth and responsive experience, especially since users frequently switch between budget tools, maps, recommendations, and reviews.

- **App Response Time:**
Normal screen transitions and operations should load within 5-10 seconds under a stable internet connection.
- **API Response Time:**
Requests made to the backend should generally return a response within 5 seconds.
- **Search & Recommendation Time:**
AI-assisted recommendations and place searches should ideally complete within 12 seconds.
- **Scalability Expectation:**
The system should handle growth in users, searches, and reviews without degrading performance.

3.5.2. Security Requirements (Qualitative)

Since the system keeps user accounts, reviews, and business information, at least minimum security must be guaranteed.

- User passwords must not be read easily and are to be hashed in a secure manner.
- There has to be measures taken to prevent unauthorized people from getting access to user sessions.
- No one but the authorized personnel will be allowed to carry out business-level actions or admin operations.
- All the confidential user data will be treated as top secret and only the system will be using it for its functionality.

3.5. SQA ACTIVITIES: DEFECT DETECTION

Chapter: 4

SYSTEM DESIGN

Chapter 4

SYSTEM DESIGN

4.1. INTRODUCTION

In this chapter, we present all the essential system design artifacts for WanderPlan, including its overall architecture, key design diagrams, detailed use cases, activity and sequence diagrams, component design, and the database structure (ERD). These elements collectively outline how the system functions, how different modules interact, and how the application supports the needs of tourists, contributors, and business owners.

4.2. ARCHITECTURAL DESIGN

The architectural design of WanderPlan follows a layered (n-tier) architecture to ensure modularity, scalability, and efficient data flow between its mobile application, business dashboard, backend, and database.

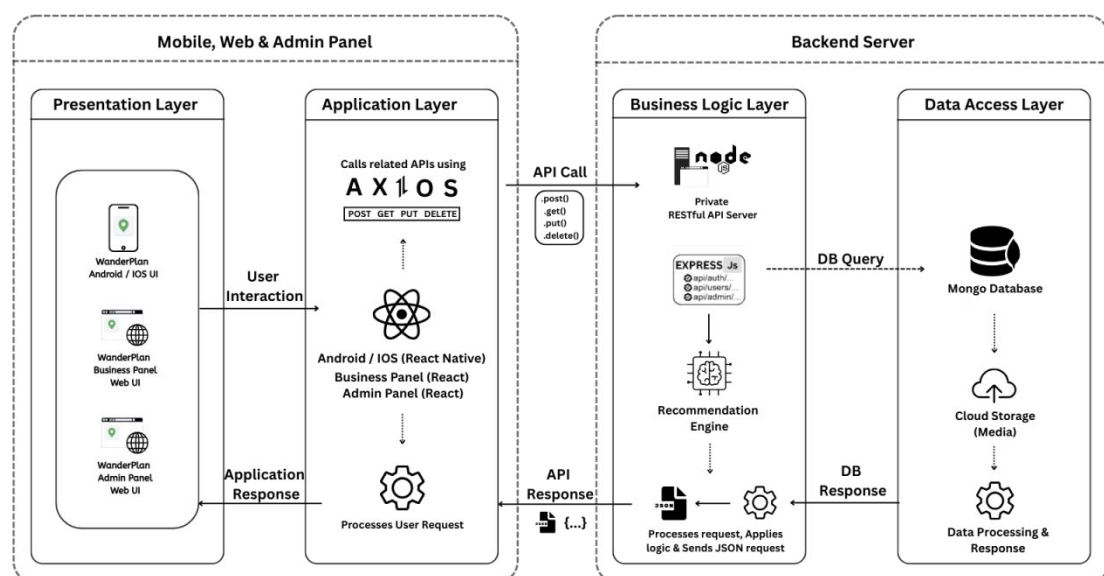


Figure . System Architecture Diagram

4.3. DETAILED DESIGN

The WanderPlan system's detailed design is shown in this section. It concentrates on how various users engage with the system via specified features. Use case diagrams are used to clearly depict system behaviour from the viewpoint of the user in the detailed design.

4.3.1. Use Case Diagrams

4.3.1.1. Authentication Use Case Diagram

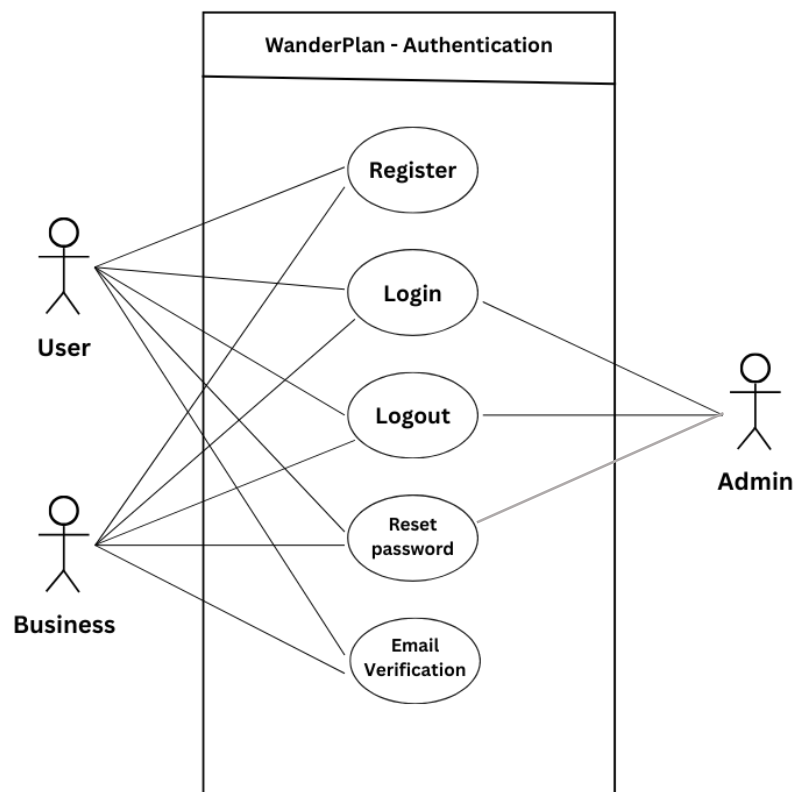


Fig011

4.3.1.2. Dashboard Use Case Diagram

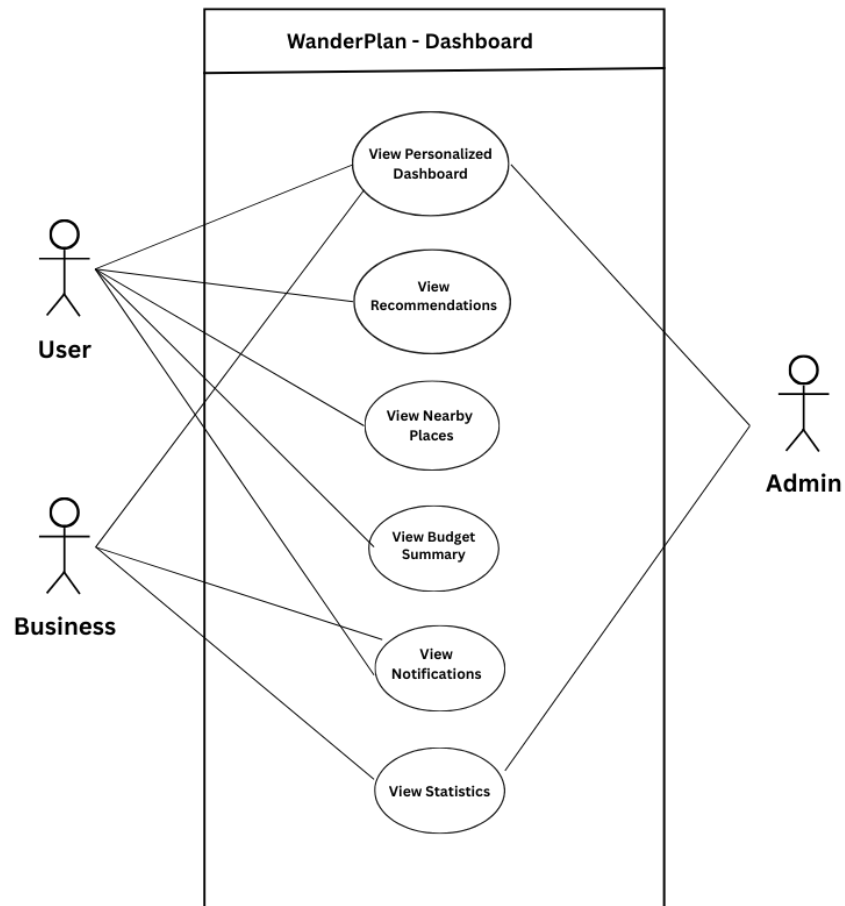


Fig0111

4.3.1.3. Recommendation & Discovery Use Case Diagram

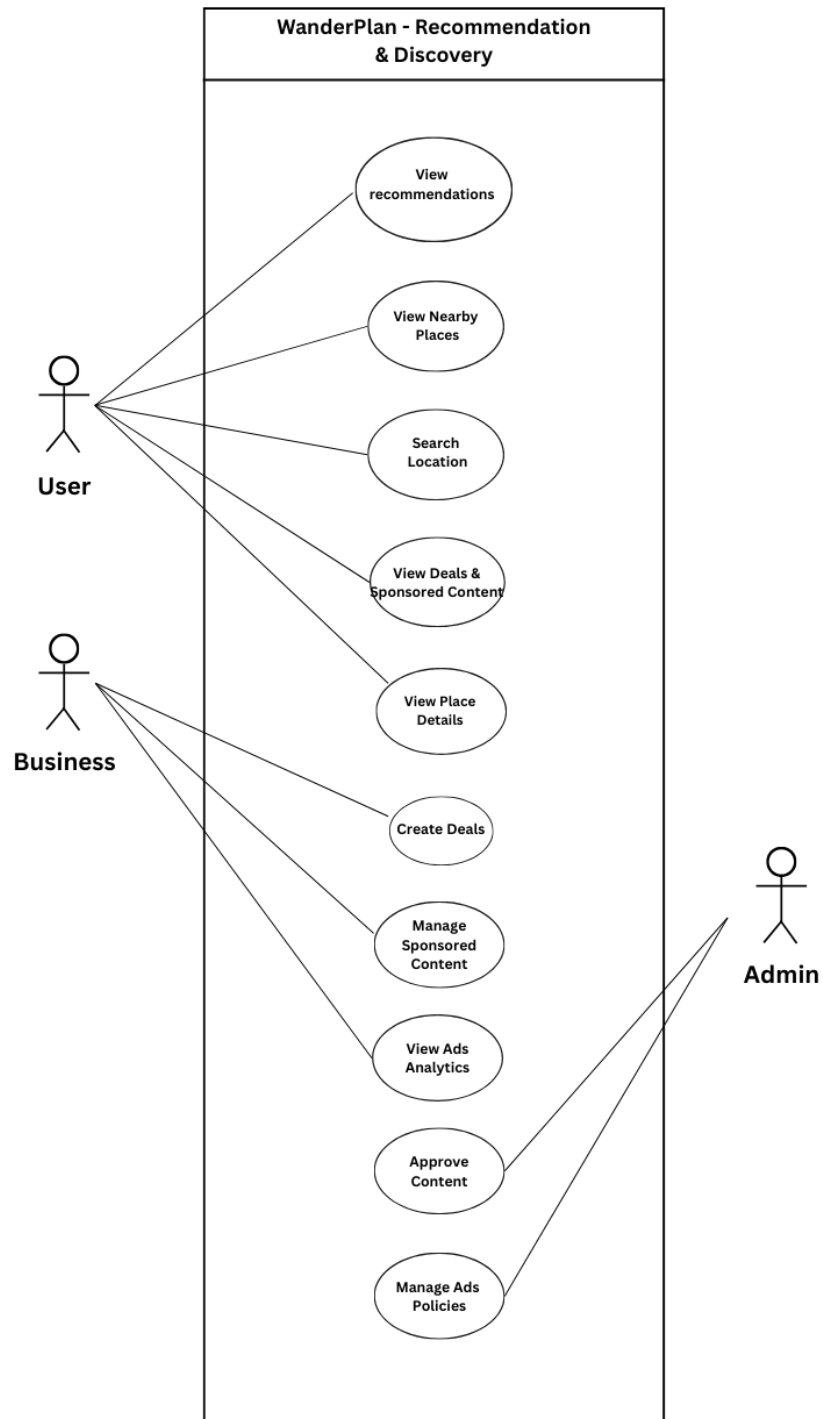


Fig0111

4.3.1.4. Reviews & UGC Use Case Diagram

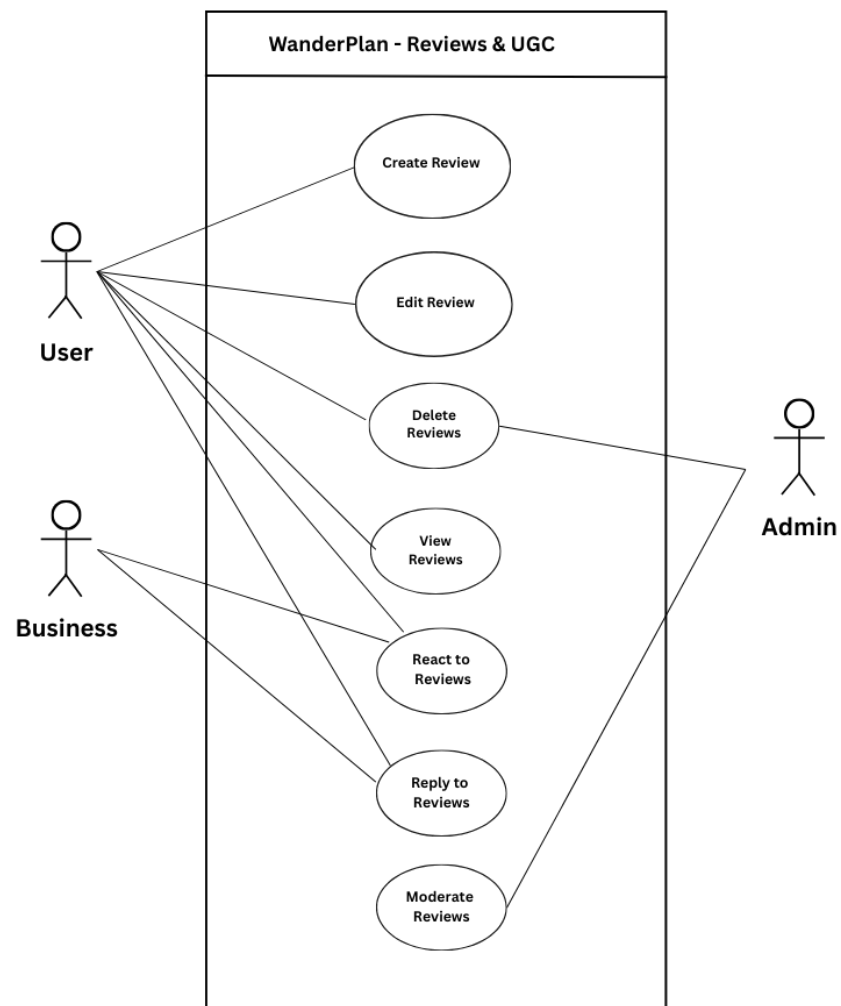


Fig01111

4.3.1.5. Trip & Budget Planning Use Case Diagram

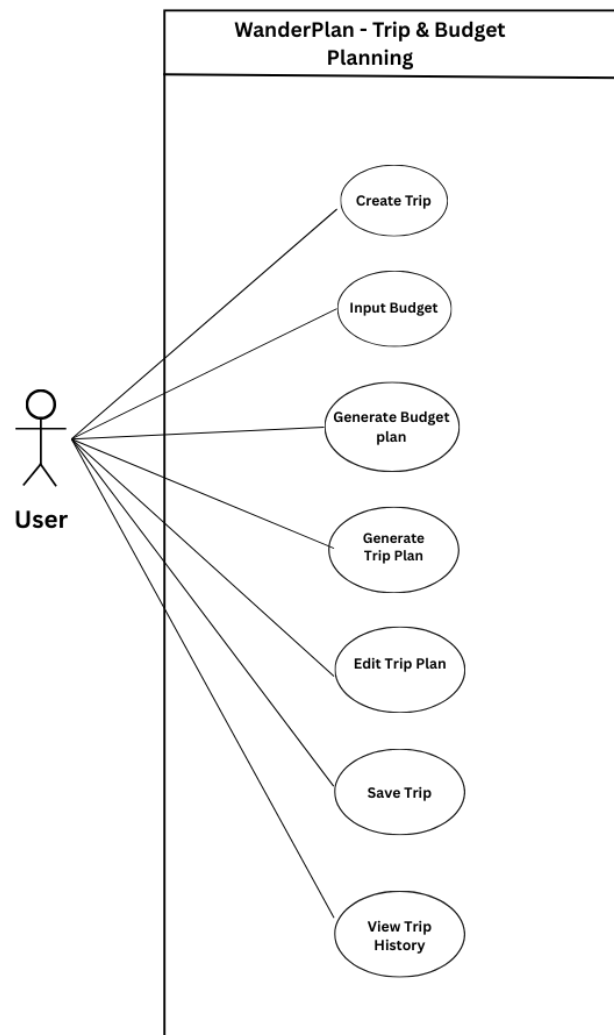


Fig0111

4.3.1.6. Profile Use Case Diagram

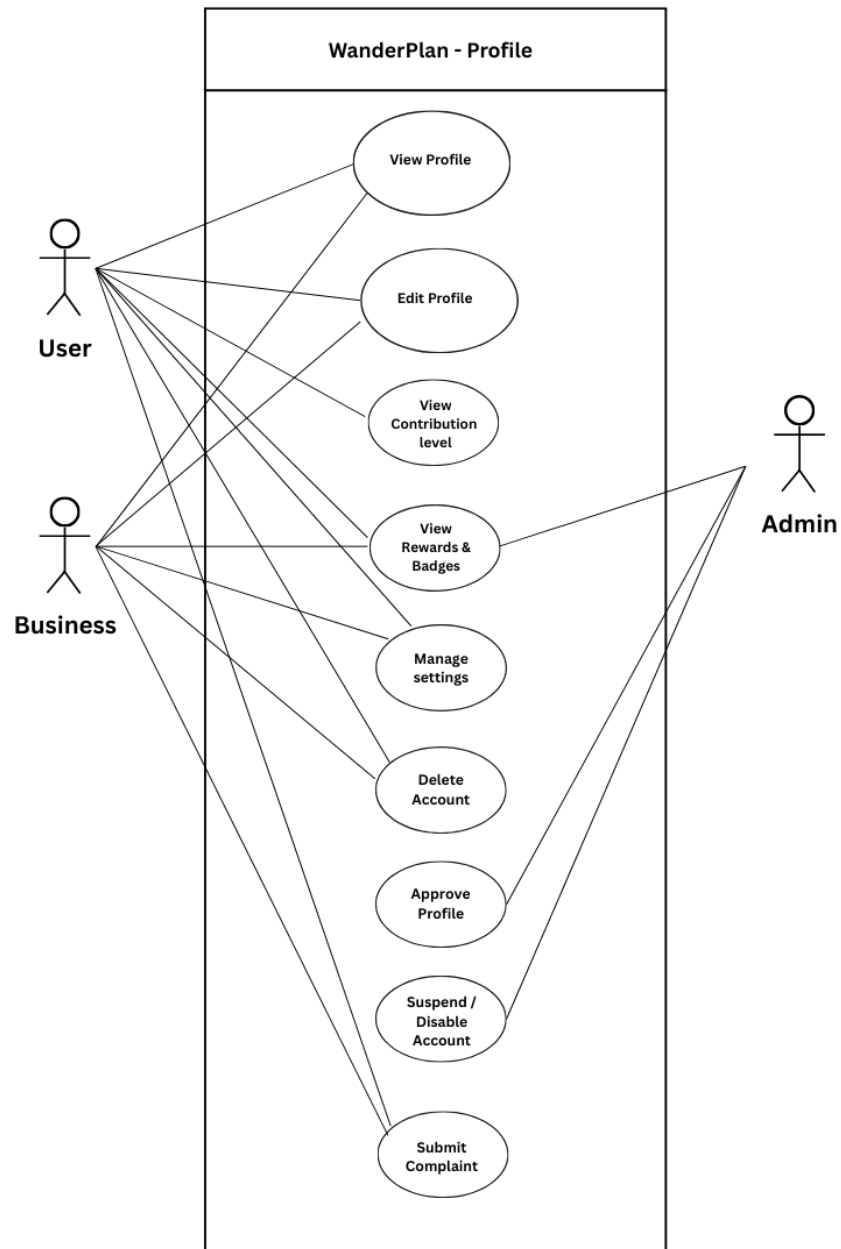
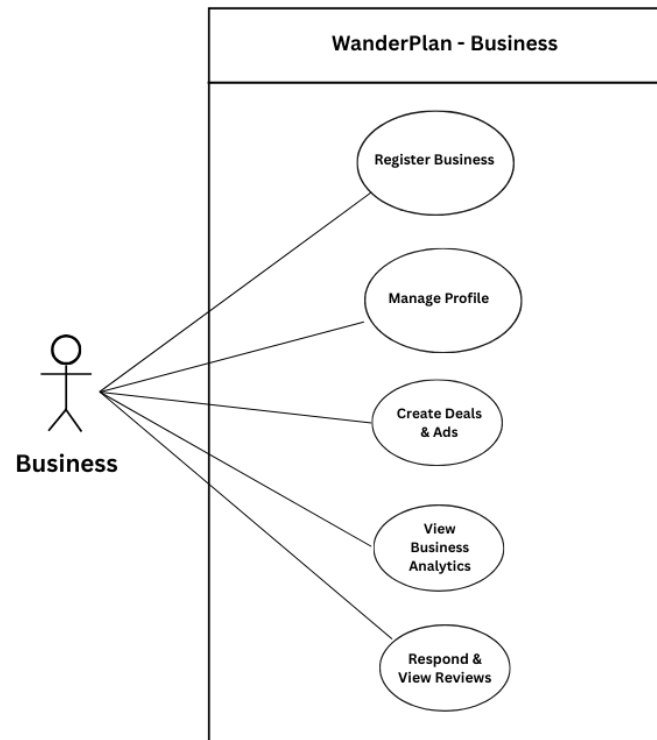
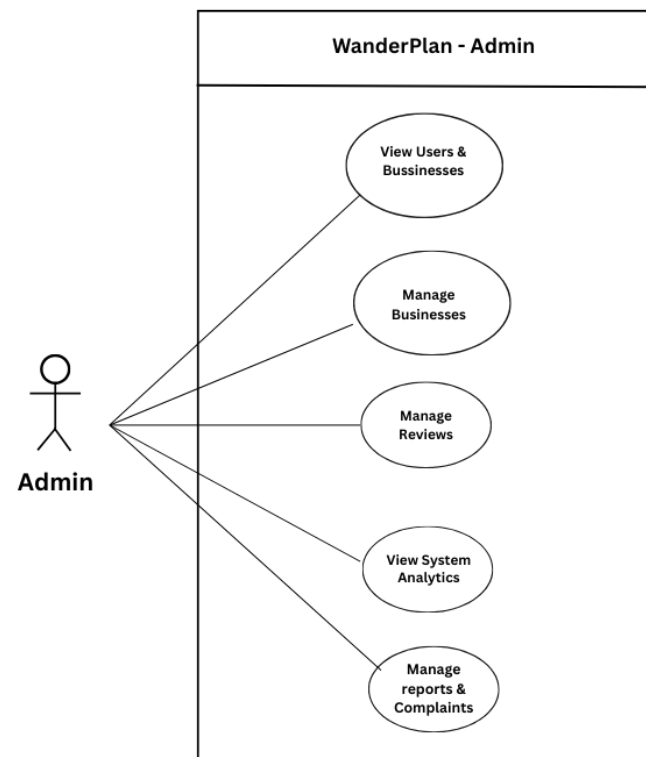


Fig0111

4.3.1.7. Business Use Case Diagram



4.3.1.8. Admin Use Case Diagram



4.3.2. Fully Dressed Use Cases

4.3.2.1. Authentication

4.3.2.1.1. Sign Up

| | | |
|------------------------|---|---|
| Use Case ID | 001 | |
| Use Case | Sign Up | |
| Actors | User | |
| Trigger | User wants to create an account | |
| Pre Conditions | User has launched into the application | |
| Post Conditions | User has successfully created account and redirected to home page. | |
| Basic Flow | Actor | System |
| | 1. User will press the button “Sign Up” on the login screen. 2. User will enter the full name & email. 3 . User will enter their password. 4 . User will enter the code sent to their email. | 1.1. User will be directed to the sign up form. 2.1. System will validate the fields. 3.1 System will verify password strength. 3.2 System will redirect the user to Email verification screen. 4.1. System validates the code and redirects it to Home Page. |
| Alternate Flow | Actor | System |
| | 2a. Email is already in use. 1. User shall return to the login screen. 2. User shall enter their email along with the password to log into their existing account. 2b. Email is already registered, but user does not remember password. 1. User shall return to login screen. 2. User will click “Forgot Password” 3. User will enter their Email. | 2.1 System will verify credentials. 2.2 System will redirect user to the home page. 3.1 System Validates the Email. |

| | | |
|--|--|---|
| | 4. User clicks “Send Reset Link” 5. User shall login to the system with new password. | 4.1 System will send a reset link to their email. 5.1 System will verify credentials. 5.2 System will redirect user to home page. |
|--|--|---|

4.3.2.1.2. Sign In

| | | |
|------------------------|--|--|
| Use Case ID | 002 | |
| Use Case | Sign In. | |
| Actors | User, Business, Admin. | |
| Trigger | User wants to log into their account. | |
| Pre Conditions | User has launched into the application. | |
| Post Conditions | User has successfully logged in and redirected to home page. | |
| Basic Flow | Actor | System |
| | 1. User will enter their login credentials. 2. User will enter the verification code. | 1.1 System will verify the credentials. 1.2 System will send a verification code on the Email of user. 2.1 System will validate the code. 2.2 System will redirect user to home page. |
| Alternate Flow | Actor | System |
| | 1a. User enters wrong credentials 1. User will be prompted to enter correct credentials. 2. User will enter login credentials again. 1b. User with forgotten password 1. User will click “Forgot Password” 2. User will enter their Email. 3. User clicks “Send Reset Link” 4. User shall login to the system | 2.1 System will verify credentials. 2.2 System will redirect user to the home page. 2.1 System Validates the Email. 3.1 System will send a reset link to their email. |

| | | |
|--|--|--|
| | with new password. | 4.1 System will verify credentials. 4.2 System will redirect user to home page. |
| | 2a. User doesnot receive email. 1. User will click “Resend” 2. User will enter the verification code. | 1.1 System will send the verification code again. 2.1 System validates the code. 2.2 System will redirect user to the home page. |

4.3.2.1.3. Sign Out

| | | |
|------------------------|--|---|
| Use Case ID | 003 | |
| Use Case | Sign Out | |
| Actors | User, Business, Admin | |
| Trigger | User wants to log out of their accounts. | |
| Pre Conditions | Users are signed into their accounts. | |
| Post Conditions | User has successfully logged out of their accounts. | |
| Basic Flow | Actor | System |
| | 1. User clicks “Sign Out”. | 1.1 System clears session. |
| Alternate Flow | Actor | System |
| | 1a. User faces network problem while logging out. 1. User will have network problem. | 1.1 System will show ‘You will be logged out automatically once the network stabilize’. |

4.3.2.1.4. Reset Password

| | | |
|--------------------|-----------------------|--|
| Use Case ID | 004 | |
| Use Case | Reset Password. | |
| Actors | User, Business, Admin | |

| | | |
|------------------------|---|--|
| Trigger | User wants to reset their forgotten password. | |
| Pre Conditions | User knows the email which was used to create the account. | |
| Post Conditions | User will have successfully reset their password. | |
| Basic Flow | Actor | System |
| | 1. User will click “Forgot Password” 2. User will enter their Email. 3. User clicks “Send Reset Link” 4. User shall login to the system with new password. | 2.1 System Validates the Email. 3.1 System will send a reset link to their email. 4.1 System will verify credentials. 4.2 System will redirect user to home page. |
| Alternate Flow | Actor | System |
| | 3a. User doesnot receive email. 1. User will click “Resend” 2. User shall login to the system with new password. | 1.1 System will send the reset link again. 2.1 System will verify credentials. 2.2 System will redirect user to the home page. |

4.3.2.2. Dashboard

4.3.2.2.1. View Personalized Dashboard.

| | | |
|------------------------|--|--|
| Use Case ID | 005 | |
| Use Case | View Personalized Dashboard. | |
| Actors | User, Business, Admin | |
| Trigger | User wants a personalized space. | |
| Pre Conditions | User is logged in the system. | |
| Post Conditions | User is shown the dashboard. | |
| Basic Flow | Actor | System |
| | 1. User will verify the email. 2. Users will be shown their | 1.1 System loads specified dashboards for each user. |

| | | |
|-----------------------|--|---|
| | specified dashboards (Home Page for the mobile application). | |
| Alternate Flow | Actor | System |
| | 1a. Service Unavailable 1. User will stabilize their connection. | 1.1 System will show cached data until network is stabilized. |

4.3.2.2.2. View Recommendations.

| | | |
|------------------------|--|---|
| Use Case ID | 006 | |
| Use Case | View Recommendations | |
| Actors | User. | |
| Trigger | Users wants to explore some places. | |
| Pre Conditions | User is logged in the system. | |
| Post Conditions | User is shown all the recommended places. | |
| Basic Flow | Actor | System |
| | 1. User will be redirected to the home page. 2. User clicks on one of the recommendations. 3. User clicks the 'Bookmark' sign. | 1.1 System will show all the attractions, hotels and restaurants which the user can visit. 2.1 System redirect it on the page with that recommendation's details. 3.1 System saves that attraction to 'Saved' in the profile. |
| Alternate Flow | Actor | System |
| | 1a. No data | 1. System will show the placeholders. |

4.3.2.2.3. View Nearby Places.

| | | |
|--------------------|--------------------|--|
| Use Case ID | 007 | |
| Use Case | View Nearby Places | |
| Actors | User. | |

| | | |
|------------------------|--|--|
| Trigger | User wants to visit someplace nearby. | |
| Pre Conditions | User has enabled location permission. | |
| Post Conditions | All the nearby recommendations are shown on the map. | |
| Basic Flow | Actor | System |
| | 1. User clicks “Maps” bar. 2. User navigates on the map. 3. User searches any place nearby with the filters. | 1.1 System gets user location. 1.2 System fetches places nearby. 3.1 System fetches the location and shows it to user. |
| Alternate Flow | Actor | System |
| | | |

4.3.2.2.4. View Budget Summary.

| | | |
|------------------------|---|---|
| Use Case ID | 008 | |
| Use Case | View Budget Summary | |
| Actors | User. | |
| Trigger | User wants to see all the spendings till now. | |
| Pre Conditions | User has atleast one trip. | |
| Post Conditions | Budget summary displayed. | |
| Basic Flow | Actor | System |
| | 1. User opens their profile. 2. User clicks on “budget summary”. | 2.1 System retrieves budget data. 2.2 System shows total budget and usage. |
| Alternate Flow | Actor | System |
| | 2a. No budget. | 1. System asks the user to create budget. |

4.3.2.2.5. View Notifications.

| | | |
|------------------------|--|--|
| Use Case ID | 009 | |
| Use Case | View Notifications. | |
| Actors | User, Business, Admin. | |
| Trigger | User wants to stay alert. | |
| Pre Conditions | User is logged into the application. | |
| Post Conditions | All notifications shown. | |
| Basic Flow | Actor | System |
| | 1. User will navigate to “My Notifications”. | 1.1 System shows the user their notifications. |
| Alternate Flow | Actor | System |
| | 1a. No notifications received. | |

4.3.2.2.6. View Statistics

| | | |
|------------------------|--|---|
| Use Case ID | 010 | |
| Use Case | View Statistics. | |
| Actors | Business, Admin | |
| Trigger | User wants to see broad view of their data. | |
| Pre Conditions | Users are logged into their account. | |
| Post Conditions | Users are shown all the statistics. | |
| Basic Flow | Actor | System |
| | 1. Business Owner or Admin will go to their dashboards. 2. Business Owner or Admin will view the statistics charts there. | 2.1 System fetches the statistics data. 2.2 System renders the charts. |
| Alternate Flow | Actor | System |
| | 1a. Insufficient data. | |

4.3.2.3. Trip & Budget Planning

4.3.2.3.1. Create Trip.

| | | |
|------------------------|--|---|
| Use Case ID | 011 | |
| Use Case | Create Trip. | |
| Actors | User | |
| Trigger | User wants to make a trip. | |
| Pre Conditions | User is logged into their account. | |
| Post Conditions | User has successfully made a trip. | |
| Basic Flow | Actor | System |
| | 1. User goes to trip planning section. 2. User fills the budget. 3. User fills up the preferences. 4. User edits the trip plan. | 1.1 System asks for budget. 2.1 System asks for preferences on the trip. 3.1 System starts to make the budget and trip plan. 3.3 System shows the trip plan. 4.1 System edits the changing and provides the plan. |
| Alternate Flow | Actor | System |
| | 2a. Invalid budget. 1. User Enters the budget again. 4a. Edits which makes the increase in budget. 1. User adds something which makes the budget count more. 2. User keeps the edit in the budget. | 1.1 System provides increase in budget error. 2.1 System edits the changing and provides the plan. |

4.3.2.3.2. Input Budget.

| | |
|------------------------|--|
| Use Case ID | 012 |
| Use Case | Input Budget. |
| Actors | User. |
| Trigger | User has to input their budget for the trip. |
| Pre Conditions | User is creating a trip. |
| Post Conditions | User's budget is distributed amongst the expenses of the trip. |

| | | |
|-----------------------|--|-----------------------------|
| Basic Flow | Actor | System |
| | 1. User goes to trip planning section. 2. User inputs their budget. | 1.1 System asks for budget. |
| Alternate Flow | Actor | System |
| | 2a. Invalid budget. 1. User enters the budget again. | |

4.3.2.3.3. Generate Trip Plan.

| | | |
|------------------------|---|--|
| Use Case ID | 013 | |
| Use Case | Generate Trip Plan. | |
| Actors | User. | |
| Trigger | User wants to see their trip plan. | |
| Pre Conditions | User enters the trip details & preferences. | |
| Post Conditions | User is shown their trip plan. | |
| Basic Flow | Actor | System |
| | 1. User enters their budget. 2. User enters their preferences. 3. User is displayed with the trip plan. | 2.1 System fetches the budget and preferences and provides all the plan within budget. |
| Alternate Flow | Actor | System |
| | 1a. Invalid Budget 1. User enters the budget again. | |

4.3.2.3.4. Save Trip.

| | | |
|-----------------------|-----------------------------------|--|
| Use Case ID | 014 | |
| Use Case | Save Trip. | |
| Actors | User. | |
| Trigger | User wants to save the trip. | |
| Pre Conditions | User has generated the trip plan. | |

| | | |
|------------------------|---|--|
| Post Conditions | The trip plan is saved. | |
| Basic Flow | Actor | System |
| | 1. User is shown the trip plan. 2. User has done all the edits they want. 3. User adds the trip plan to favorite. | 2.1 System finalizes the trip plan. 3.1 System adds the trip to saved plans in profile. |
| Alternate Flow | Actor | System |
| | | |

4.3.2.3.5. View Trip History.

| | | |
|------------------------|---|---|
| Use Case ID | 015 | |
| Use Case | View Trip History. | |
| Actors | User. | |
| Trigger | User wants to view trip history. | |
| Pre Conditions | User has atleast one trip plan. | |
| Post Conditions | User is displayed their all trips. | |
| Basic Flow | Actor | System |
| | 1. User opens the profile and looks for saved trips. | 1.1 System fetches the saved trips. 1.2 System displays all the saved trips. |
| Alternate Flow | Actor | System |
| | 1a. No saved trips. 1. User has no saved trips. | 1.1 System shows empty state. |

4.3.2.4. Reviews & User Generated Content

4.3.2.4.1. Create Review

| | |
|--------------------|---------------------------------------|
| Use Case ID | 016 |
| Use Case | Create Review. |
| Actors | User. |
| Trigger | User wants to share their experience. |

| | | |
|------------------------|--|---|
| Pre Conditions | User is logged into the account. | |
| Post Conditions | Review is published. | |
| Basic Flow | Actor | System |
| | 1. User opens the review tab. 2. User clicks on the '+' sign. | 1.1 System shows all the reviews to the user. |
| Alternate Flow | Actor | System |
| | | |

4.3.2.4.2. Edit Review

| | | |
|------------------------|---|---------------|
| Use Case ID | 017 | |
| Use Case | Edit Review | |
| Actors | User. | |
| Trigger | User wants to edit their review. | |
| Pre Conditions | Review the user wants to edit is already published. | |
| Post Conditions | Review is updated. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.4.3. Delete Review

| | | |
|------------------------|---|---------------|
| Use Case ID | 018 | |
| Use Case | Delete Review | |
| Actors | User | |
| Trigger | User wants to delete their review. | |
| Pre Conditions | Review the user wants to delete is already published. | |
| Post Conditions | Review is removed from the feed. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |

| | | |
|--|--|--|
| | | |
|--|--|--|

4.3.2.4.4. View Reviews

| | | |
|------------------------|------------------------------------|---------------|
| Use Case ID | 019 | |
| Use Case | View Reviews | |
| Actors | User, Business | |
| Trigger | User wants to view reviews. | |
| Pre Conditions | User is logged into their account. | |
| Post Conditions | User is viewing the reviews. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.4.5. React to Reviews

| | | |
|------------------------|------------------------------------|---------------|
| Use Case ID | 020 | |
| Use Case | React to Reviews. | |
| Actors | User, Business. | |
| Trigger | User wants to react to review. | |
| Pre Conditions | User is logged into their account. | |
| Post Conditions | Reaction is recorded. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.4.6. Reply to Reviews

| | |
|--------------------|-----|
| Use Case ID | 021 |
|--------------------|-----|

| | | |
|------------------------|---------------------------------------|---------------|
| Use Case | Reply to Reviews. | |
| Actors | User. | |
| Trigger | User wants to comment on the reviews. | |
| Pre Conditions | The review to reply on exists. | |
| Post Conditions | Reply is recorded. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.4.7. Moderate Reviews

| | | |
|------------------------|--------------------------------------|---------------|
| Use Case ID | 022 | |
| Use Case | Moderate Reviews. | |
| Actors | Admin. | |
| Trigger | Admin wants to moderate the reviews. | |
| Pre Conditions | Admin is logged into their account. | |
| Post Conditions | Review is moderated. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.5. Profile

4.3.2.5.1. View Profile

| | | |
|-----------------------|-------------------------------------|--|
| Use Case ID | 023 | |
| Use Case | View Profile. | |
| Actors | User, Business, Admin. | |
| Trigger | Users wants to open their profiles. | |
| Pre Conditions | User is logged into their accounts. | |

| | | |
|------------------------|-------------------------------|---------------|
| Post Conditions | User is shown their profiles. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.5.2. Edit Profile

| | | |
|------------------------|-------------------------------------|---------------|
| Use Case ID | 024 | |
| Use Case | Edit Profile. | |
| Actors | User, Business. | |
| Trigger | User wants to edit their profile. | |
| Pre Conditions | User is logged into their account. | |
| Post Conditions | The profile of the user is updated. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.5.3. View Contribution Level

| | | |
|------------------------|-------------------------------------|---------------|
| Use Case ID | 025 | |
| Use Case | View Contribution Level. | |
| Actors | User, Business. | |
| Trigger | User wants to edit their profile. | |
| Pre Conditions | User is logged into their account. | |
| Post Conditions | The profile of the user is updated. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.5.4. Manage Settings

| | | |
|------------------------|--|---------------|
| Use Case ID | 026 | |
| Use Case | Manage Settings. | |
| Actors | User, Business, Admin. | |
| Trigger | User wants to manage their account settings. | |
| Pre Conditions | User is logged into their account. | |
| Post Conditions | The changes are applied. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.5.5. Delete Account

| | | |
|------------------------|-------------------------------------|---------------|
| Use Case ID | 027 | |
| Use Case | Delete Account. | |
| Actors | User, Business. | |
| Trigger | User wants to delete their account. | |
| Pre Conditions | User is logged into their account. | |
| Post Conditions | The account of the user is deleted. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.5.6. Approve Account

| | | |
|------------------------|--|---------------|
| Use Case ID | 028 | |
| Use Case | Approve Account. | |
| Actors | Admin. | |
| Trigger | Admin needs to verify the business accounts. | |
| Pre Conditions | Business registration request is received. | |
| Post Conditions | The business is approved/disapproved. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.5.7. Disable Account

| | | |
|------------------------|---------------------------------------|---------------|
| Use Case ID | 029 | |
| Use Case | Disable Account. | |
| Actors | User, Business. | |
| Trigger | User wants to disable their accounts. | |
| Pre Conditions | User is logged into their account. | |
| Post Conditions | The account of the user is disabled. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.5.8. Submit Complaint

| | | |
|-----------------------|------------------------------------|--|
| Use Case ID | 030 | |
| Use Case | Submit Complaint. | |
| Actors | User, Business. | |
| Trigger | User wants to send complaint. | |
| Pre Conditions | User is logged into their account. | |

| | | |
|------------------------|---|---------------|
| Post Conditions | The complaint of the user is submitted. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.6. Bussiness

4.3.2.6.1. Register Business

| | | |
|------------------------|--|---------------|
| Use Case ID | 031 | |
| Use Case | Register Business. | |
| Actors | Business. | |
| Trigger | User wants to register their business. | |
| Pre Conditions | User has launched the web application. | |
| Post Conditions | User has successfully sent their account for verification. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.6.2. Manage Profile

| | | |
|------------------------|--|---------------|
| Use Case ID | 032 | |
| Use Case | Manage Profile. | |
| Actors | Business. | |
| Trigger | User wants to manage their profile. | |
| Pre Conditions | Business is verified and is logged into their account. | |
| Post Conditions | The business profile is updated. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |

| | | |
|--|--|--|
| | | |
|--|--|--|

4.3.2.6.3. Create Deals & Ads

| | | |
|------------------------|--|---------------|
| Use Case ID | 033 | |
| Use Case | Create deals & Ads. | |
| Actors | Business. | |
| Trigger | User wants to create an ad for their business. | |
| Pre Conditions | Business is verified and is logged into their account. | |
| Post Conditions | The ad is running on the application. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.6.4. View Business Analytics

| | | |
|------------------------|--|---------------|
| Use Case ID | 034 | |
| Use Case | View business analytics. | |
| Actors | Business. | |
| Trigger | User wants to see their sales, engagement etc. | |
| Pre Conditions | Business is verified and is logged into their account. | |
| Post Conditions | User is displayed with the charts and other data. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.6.5. Respond & View Reviews

| | |
|--------------------|-----|
| Use Case ID | 035 |
|--------------------|-----|

| | | |
|------------------------|---|---------------|
| Use Case | Respond & View Reviews. | |
| Actors | Business. | |
| Trigger | User wants to view reviews of their business. | |
| Pre Conditions | Business is verified and is logged into their account. | |
| Post Conditions | The user is displayed with all the reviews of their business. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.7. Admin

4.3.2.7.1. View Users & Businesses

| | | |
|------------------------|--|---------------|
| Use Case ID | 036 | |
| Use Case | View users & businesses. | |
| Actors | Admin. | |
| Trigger | Admin wants to view all users and businesses registered. | |
| Pre Conditions | Admin is logged into their account. | |
| Post Conditions | Admin is shown all the users and businesses registered. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.7.2. Manage Businesses

| | | |
|-----------------------|--|--|
| Use Case ID | 037 | |
| Use Case | Manage Businesses. | |
| Actors | Admin. | |
| Trigger | Admin have to verify all the business registration requests. | |
| Pre Conditions | Business verification request is notified to admin. | |

| | | |
|------------------------|---|---------------|
| Post Conditions | The business request is approved/disapproved. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.7.3. Manage reviews

| | | |
|------------------------|-------------------------------------|---------------|
| Use Case ID | 038 | |
| Use Case | Manage reviews. | |
| Actors | Admin. | |
| Trigger | Admin wants to moderate reviews. | |
| Pre Conditions | Admin is logged into their account. | |
| Post Conditions | The reviews are moderated. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.7.4. View system analytics

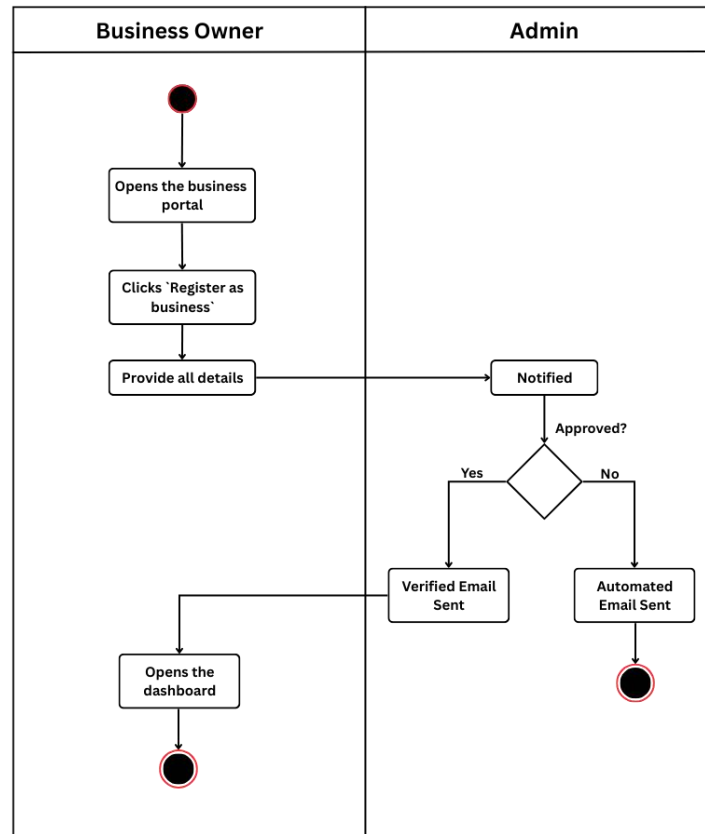
| | | |
|------------------------|--|---------------|
| Use Case ID | 039 | |
| Use Case | View system analytics. | |
| Actors | Admin. | |
| Trigger | Admin wants to view analytics of the system. | |
| Pre Conditions | Admin is logged into their account. | |
| Post Conditions | The system analytics are displayed. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.2.7.5. Manage reports & complaints

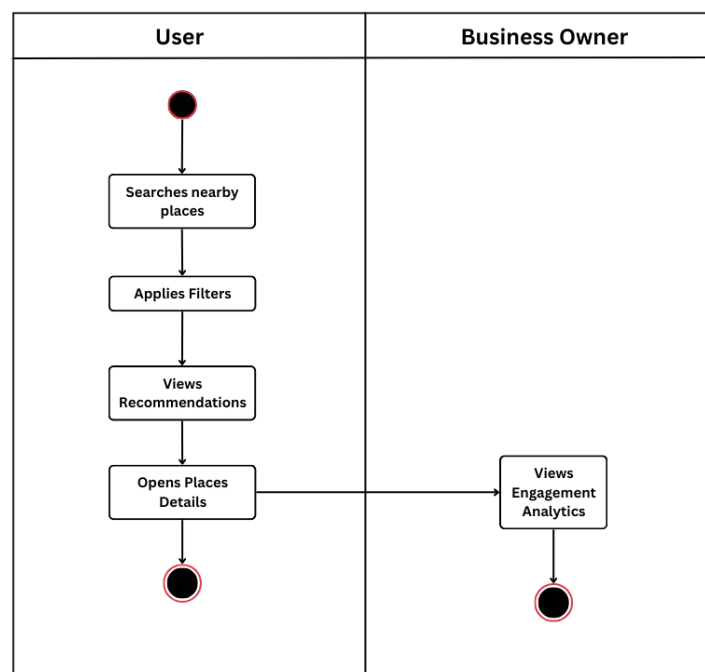
| | | |
|------------------------|---|---------------|
| Use Case ID | 040 | |
| Use Case | Manage reports & complaints. | |
| Actors | Admin. | |
| Trigger | Admin have to manage all the reports and complaints. | |
| Pre Conditions | All the reports and complaints are notified to admin. | |
| Post Conditions | Admin resolves the reports and complaints. | |
| Basic Flow | Actor | System |
| | | |
| Alternate Flow | Actor | System |
| | | |

4.3.3. Activity Diagrams

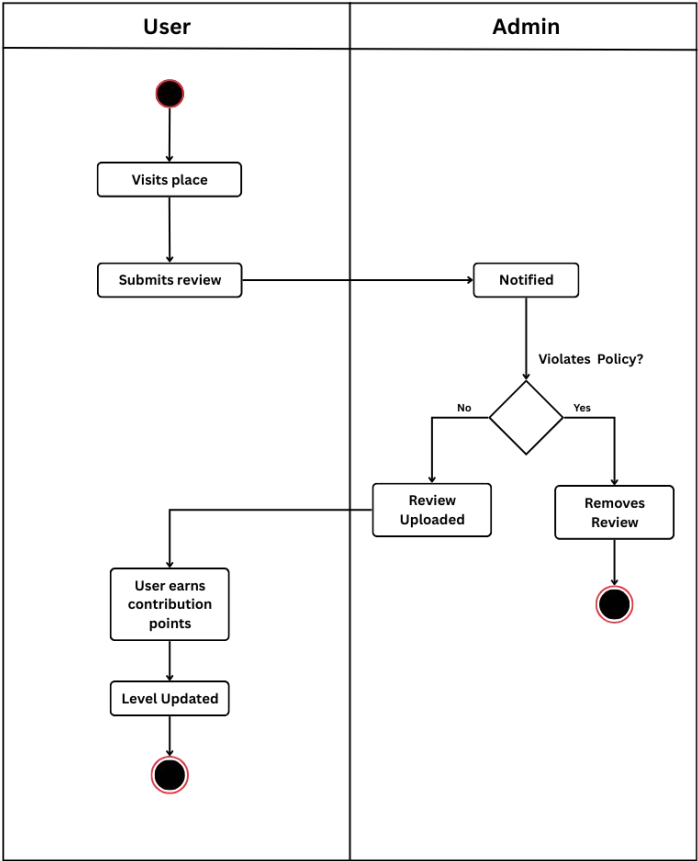
4.3.3.1. Bussiness Registration



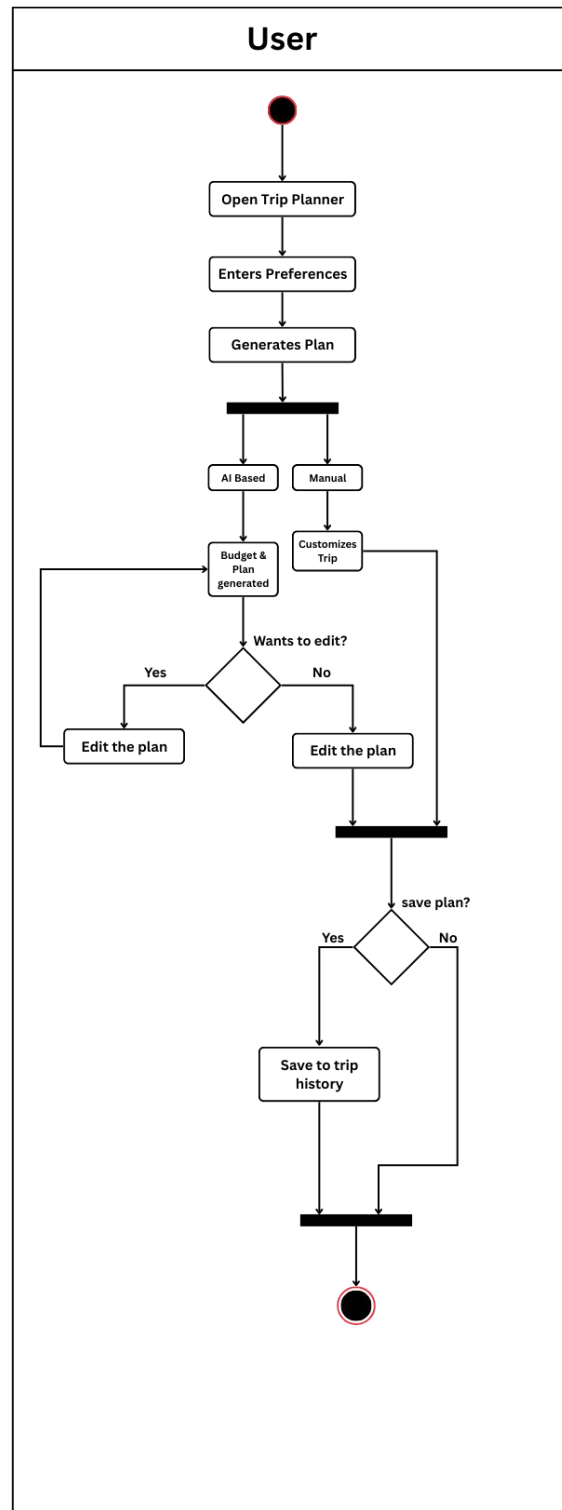
4.3.3.2. Recommendation & Discovery



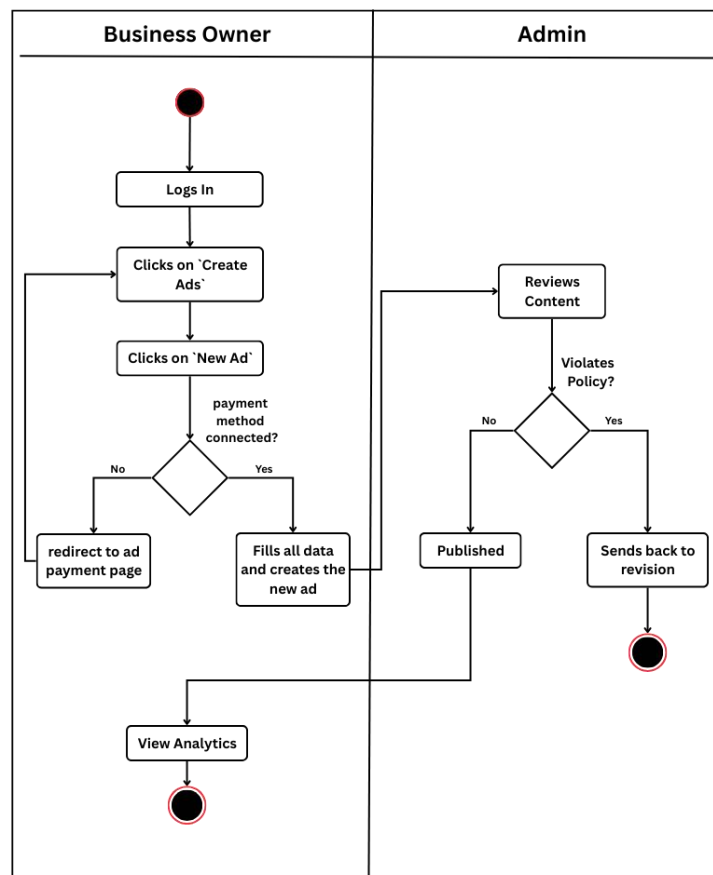
4.3.3.3. Reviews & Contributions



4.3.3.4. Trip Planning & Budget



4.3.3.5. Ads & Deals



4.4. DATABASE DESIGN

4.5. SQA ACTIVITIES: DEFECT DETECTION

Chapter: 5

IMPLEMENTATION

Chapter 5

IMPLEMENTATION

5.1. ENDEAVOR (TEAM WORK + WORK + WAY OF WORKING)

5.1.1. Team

- Abdullah Ahtsham 45679
- M. Nabeel Awais 43944
- M. Bilal Butt 44712

5.1.2. Work Breakdown Structure

5.1.3. Roles & Responsibility Matrix

| WBS Name | Activity | Roles (Responsible, Accountable, Consulted, Informed) | | |
|----------|----------|---|---------------|----------------|
| | | Abdullah Ahtsham | M. Bilal Butt | M.Nabeel Awais |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

5.1.4. Way of Working

5.1.4.1. Abdullah Ahtsham - Documentation, UI/UX & Wireframes, Testing.

5.1.4.2. M. Bilal Butt - Mobile Application, Backend Server & Database.

5.1.4.3. M. Nabeel Awais - Business Panel, Admin Panel.