

Lab 2 – WiseTraveler Specification

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1. Introduction

When people travel, they seek enjoyment, cultural discovery, and relaxation. In 2023, approximately 49 million U.S. residents ventured overseas, reflecting a strong desire for global exploration (Statista Research Department, 2024). By mid-2024, international tourism had rebounded to 96% of pre-pandemic levels, with 790 million international travelers a remarkable 11% increase from the previous year (UN Tourism, 2024). Despite this surge, the process of planning a trip remains daunting for many. Travelers often navigate a maze of websites and apps to piece together basic information, only to end up with generic recommendations focused on overcrowded tourist hotspots. For those unsure of their destination, finding inspiration can feel impossible amidst the overwhelming noise of the internet.

Beyond the challenge of inspiration, travelers face risks stemming from incomplete or outdated information. Many struggles with safety concerns, language barriers, cultural differences, and a lack of localized insights, which can leave them vulnerable to crime, unsafe water, and poor sanitation, or stuck in tourist traps. This uncertainty discourages exploration of authentic, less crowded spots, diminishing the joy and relaxation they seek. Planning a trip should be part of the excitement, not a stressful chore, yet the current process often fails to meet travelers' needs.

The solution to the problem is WiseTraveler, a Centralized AI Travel Guide designed to revolutionize the travel planning experience. WiseTraveler eliminates the need to juggle multiple resources by consolidating all essential travel information in one place, providing a hassle-free and comprehensive platform. For those unsure of where to go, it offers personalized recommendations tailored to their interests and preferences, inspiring their next journey. Beyond mainstream tourist spots, WiseTraveler highlights unique, culturally immersive experiences while delivering critical safety, health, and travel alerts to ensure peace of mind.

WiseTraveler serves as more than just a planning tool it's a trusted companion for every step of a traveler's adventure. With features like a dynamic map for discovering lesser-known spots and local events, region specific risk alerts, and tailored suggestions for destinations, attractions, and activities, it empowers users to explore with confidence. By streamlining the travel planning process and encouraging exploration off the beaten path, WiseTraveler allows travelers to focus on the journey itself, turning the thrill of adventure into a stress-free and truly enriching experience.

1.1 Purpose

The purpose of this Software Requirements Specification (SRS) document is to define the functional and non-functional requirements of the WiseTraveler platform. It provides a structured framework for understanding the system's objectives, features, and constraints, ensuring clarity for stakeholders, developers, and testers. This document serves as a reference to guide the design, development, and evaluation of the platform, outlining the necessary specifications for implementation. By detailing the system's capabilities, user interactions, and performance expectations, the SRS ensures that WiseTraveler meets its intended purpose effectively.

1.2 Scope

The WiseTraveler platform is designed to revolutionize the travel planning experience by providing users with AI-powered recommendations, personalized itineraries, and real-time safety and cultural insights. The system consolidates essential travel information in one place, reducing the need for travelers to rely on multiple sources.

The WiseTraveler prototype will retain most of the core functionality of the real-world product but with limited data and scaled-down features. Users will be able to search for destinations, receive AI-generated recommendations based on their preferences, and explore

interactive maps with highlighted points of interest. The prototype will also include region-specific risk alerts and cultural insights to ensure travelers have essential information before their trips.

Registered users will be able to create profiles, save itineraries, and receive customized recommendations. However, real-time updates, third-party service integrations, and extensive global data coverage may be limited in the prototype. The primary goal is to demonstrate the effectiveness of AI-driven travel planning while refining key features before full-scale deployment.

While the WiseTraveler platform will not handle bookings directly, it will provide links to third-party services where travelers can book hotels, flights, and other travel-related services. These integrations will ensure that users can access the necessary resources to complete their travel arrangements, while WiseTraveler focuses on delivering insightful and personalized planning support.

1.3 Definition, Acronyms, and Abbreviations

Administrator: A user with elevated permissions and access levels, responsible for managing platform settings, overseeing user accounts, maintaining features, and addressing technical issues.

AI-Powered Assistance: Integration of artificial intelligence to simplify and personalize the research, planning, and trip recommendation process for users.

Centralized Platform: A unified system that consolidates essential travel information, allowing users to access everything they need in one place rather than consulting multiple sources.

Chai: An assertion library that works with Mocha for clearer and more expressive test writing.

Continuous Integration/Continuous Deployment (CI/CD): A software development practice where code changes are frequently merged into a shared repository, automatically tested, and deployed into production with minimal manual intervention.

GitLab: A web-based DevOps platform that combines version control (via Git) with CI/CD pipelines, issue tracking, and code collaboration.

Google Maps API: A third-party mapping service that provides geolocation, maps, route planning, and location-based insights.

Guest User: A user accessing the system without registering for a personal account. Guest users can explore limited features but are unable to save preferences, access personalized recommendations, or engage in user-generated content.

Hidden Gems: Lesser-known, unique, and culturally rich travel destinations or experiences that are off the beaten path and away from overcrowded tourist spots.

Jest: A JavaScript testing framework that allows developers to write and run tests to ensure their code is functioning as expected.

Mocha: A testing framework for Node.js that allows asynchronous testing and organizes test cases effectively.

Next.js: A React based web framework that makes building fast and scalable web applications easier. It provides features like server-side rendering and static site generation to improve performance and search engine optimization.

Node.js: A server-side JavaScript runtime environment used for building scalable and efficient backend logic.

OpenAI API: An external AI integration used to generate insights, content, and personalized suggestions for users.

Personalized Recommendations: Suggestions for destinations, activities, and attractions based on user preferences, search history, or user behavior.

PostgreSQL: An advanced, open-source relational database known for its reliability, scalability, and extensibility. It supports complex queries, ACID compliance, and real-time data processing, making it ideal for applications like WiseTraveler.

Registered Traveler: A user who has created a personal account within the WiseTraveler platform. These users can save preferences, access personalized trip recommendations, participate in community discussions, share reviews, and utilize advanced features such as itinerary planning and alerts.

Supabase: An open-source backend-as-a-service (BaaS) built on PostgreSQL. It provides database management, authentication, real-time subscriptions, storage, and serverless functions, making it a powerful alternative to Firebase.

VSCode (Visual Studio Code): A versatile, open-source code editor developed by Microsoft that supports numerous extensions and is widely used by developers.

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1.5 Overview

The WiseTraveler prototype Specifications outlines the product perspective, core functions, and user characteristics, along with constraints and assumptions. It provides an overview of the system's key features, how they interact, and the roles of different users.

2. Overall Description

WiseTraveler is an AI-powered platform designed to streamline travel planning by offering personalized recommendations, real-time insights, and an integrated map that highlights lesser-known destinations and events. It consolidates essential travel information, ensuring users can avoid overcrowded tourist spots while staying informed about health, safety, and cultural nuances. The platform also features community-driven content, intelligent itinerary planning, and real-time travel updates, fostering a seamless and engaging experience. Built with React, Node.js, and PostgreSQL, WiseTraveler utilizes APIs like OpenAI and Google Maps to enhance user experience, supported by robust testing, version control, and development tools.

2.1 Product Perspective

WiseTraveler is an AI-powered travel companion designed to simplify trip research and planning by providing personalized recommendations, real-time insights, and a dynamic map to explore hidden gems. The platform consolidates essential travel information, helping users avoid overcrowded tourist hotspots while staying informed about health, safety, and cultural risks. WiseTraveler integrates community-driven content, allowing verified users to share tips, reviews, and insights on authentic experiences. With itinerary planning, real-time travel updates, and

detailed safety precautions, the platform enhances the travel experience by fostering cultural awareness and ensuring a safer, more immersive journey.

To support the development of the WiseTraveler platform, desktop computers with sufficient processing power, memory, and storage are required for coding, debugging, and testing. The major functional components of our system, as illustrated in Figure 1, are divided into three layers. The Application Layer, which integrates APIs like OpenAI and Google Places to deliver personalized recommendations; and the Data Layer, responsible for storing and processing travel-related data. These layers work together to offer a seamless user experience.

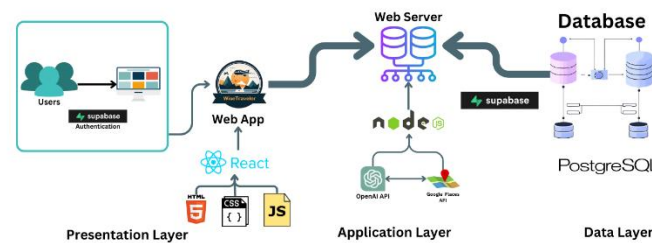


Figure 1: Major Functional Component Diagram

On the front end, React and Next.js are used for building the user interface, while the back end relies on Node.js for server-side logic. The database is built on PostgreSQL with Supabase, ensuring scalability and reliability for managing travel data. Supabase's authentication system allows secure user access. The OpenAI API and Google Maps API are integrated into the application layer, providing intelligent recommendations and location-based insights. Testing is supported by frameworks such as Jest, Mocha, and Chai, with GitLab ensuring continuous integration and deployment. GitHub is utilized for version control and collaboration, and Visual

Studio Code serves as the primary development environment. Together, these tools and technologies enable the delivery of a reliable, engaging, and powerful travel platform.

2.2 Product Functions

These are some of our main features designed to enhance the travel planning experience. Centralized Information aggregates data from multiple sources into one cohesive platform, enabling users to access relevant travel details such as destinations, accommodations, activities, and local information in one place. AI Assistance for Planning and Research leverages artificial intelligence to provide users with tailored recommendations and suggestions for their trips based on their preferences, travel history, and current trends. Personalized Travel Recommendations uses user data and machine learning algorithms to offer customized travel suggestions, ensuring each traveler receives relevant advice suited to their unique needs. Map Integration allows users to visualize their travel itineraries and locations on interactive maps, helping them plan and navigate their journeys more efficiently.

All features are illustrated in Table 1 below, which outlines the current functionality of each feature in the prototype versus the real-world product. While Language Translation Tools could be an important feature in the future, we are currently focusing on developing and refining the core features first. If time allows, we may consider adding this feature later, but at this time, it is not part of the prototype.

	WiseTraveler	Prototype	RWP
User Interface	AI assistance	Fully Functional	Fully Functional
	Safety Concerns	Partially Functional	Fully Functional
	Health Risk	Partially Functional	Fully Functional
	Cultural Discovery	Partially Functional	Fully Functional
	Local Customs	Partially Functional	Fully Functional
	User Reviews	Partially Functional	Fully Functional
	Centralized Information	Fully Functional	Fully Functional
	Language Translation tools	Not Functional	Fully Functional
	Personalized Travel Recommendations	Fully Functional	Fully Functional
	Calendar	Partially Functional	Fully Functional
	Interactive Map	Fully Functional	Fully Functional

Table 1: *User Interface Features*

2.3 User Characteristics

The Administrator is responsible for managing the platform's functionality, user activity, and overall system maintenance. This role includes overseeing content moderation, user account management, and ensuring the system runs smoothly. Admins have advanced knowledge of the platform and its backend, manage system updates, troubleshoot issues, and ensure compliance with platform policies. They also handle user behavior, resolve technical problems, and implement new features or changes.

The Registered Traveler is an authenticated user who has created an account and can access personalized features, such as saving itineraries, receiving tailored recommendations, and participating in the community by reviewing destinations or experiences. Registered travelers can save their travel recommendations and itineraries, receive personalized suggestions based on their preferences and history, and engage with the platform through reviews, comments, and feedback.

The Guest is an unregistered user who can explore the platform but has limited access to personalized features. Guests can browse destinations and general recommendations but cannot save itineraries, receive tailored suggestions, or interact with other users. Guests have the option to create an account to unlock more personalized features, but they can still explore the platform without registering.

Each of these roles interacts with the platform in different ways, ensuring that the system caters to various user needs while maintaining security and functionality.

2.4 Constraints

The following technical, customer, and security risks have been identified, along with corresponding mitigation strategies:

For technical risks, one concern is that features may be inaccessible without an internet connection. To address this, offline capabilities will be provided for essential features, allowing users to access basic functionalities even when connectivity is unavailable. Another potential issue is that problems with third-party APIs could disrupt the platform's functionality. To mitigate this, third-party services, such as OpenAI, Google Places, and Supabase, will be closely monitored, and redundancies or fallback mechanisms will be implemented to ensure the system remains operational in the event of API failures. As the platform grows, there is also a risk that it may struggle to handle a growing user base. To address this, scalable infrastructure will be used, following best practices to accommodate increasing traffic and ensure the platform can handle peak loads.

From a customer perspective, there is a risk that users may receive inaccurate or misleading information from the app. This will be mitigated by maintaining the quality of the

service, ensuring that information provided by WiseTraveler is accurate, clear, and regularly updated. Another risk is that users may lose interest in using the app. To keep users engaged, new features, regular updates, and enhanced functionality will be introduced. Additionally, users may be dissatisfied with the recommendations provided. To address this, feedback mechanisms will be implemented, allowing users to submit their opinions and experiences, which will help improve the recommendation algorithm over time.

Regarding security risks, attempts may be made to hack or hijack users' accounts. To mitigate this, multi-factor authentication (MFA) will be implemented, and strong, unique passwords will be required. Clerk will be used for authentication to ensure secure login and account management. Another security concern is the potential compromise of user data. To prevent this, all data will be encrypted in transit via HTTPS, and thorough security assessments, including penetration testing, will be conducted to identify and address vulnerabilities. Lastly, users may encounter malicious links or files that could lead to security breaches. To protect users, security warnings will be displayed when users attempt to click on external links or open files that redirect away from WiseTraveler content.

These risks and mitigation strategies will help guide the development process, ensuring that potential issues are addressed and that the platform remains secure and reliable for users.

2.5 Assumptions and Dependencies

Supabase will be used for backend services, including authentication, database management, and storage, providing scalability and reliability for handling user data and requests.

Clerk will be used for user authentication, enabling secure and seamless login functionality that integrates well with the platform.

OpenAI API will power the AI-assisted travel planning and recommendation features, providing the required functionality for real-time interactions and personalized suggestions.

Google Places API will be used for retrieving location-based data, such as maps, destinations, and place information, offering accurate and up-to-date data for travel recommendations and mapping features. data for use in travel recommendations and mapping features.