

Lab 1 – WiseTraveler

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Lab 1 – Version 1

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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Beyond the challenge of inspiration, travelers face risks stemming from incomplete or outdated information.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.

2. WiseTraveler Product Description

2.1 Key Product Features and Capabilities

WiseTraveler is an AI-powered travel companion designed to simplify trip research and planning by providing tailored suggestions and real-time insights. As a centralized platform, it consolidates all essential travel information in one place, eliminating the need for users to search multiple sources. By offering personalized recommendations for destinations, attractions, activities, and itineraries based on user preferences, WiseTraveler makes trip planning effortless and enjoyable.

What sets WiseTraveler apart is its AI integration, which assists travelers in efficiently researching and planning their trips. Unlike traditional travel guides, it provides a dynamic map that highlights hidden gems, lesser-known spots, and local events, encouraging travelers to explore beyond overcrowded tourist hotspots. The platform also delivers real-time health and safety alerts, notifying users of region-specific risks, including high-crime areas, cultural sensitivities, and health concerns such as diseases or unsafe water. With quick guides on local laws, customs, and wildlife risks, WiseTraveler ensures that travelers remain informed and prepared, promoting safer and more respectful exploration.

WiseTraveler solves the problem of fragmented and outdated travel information by integrating community-driven content, where verified users share reviews, tips, and insights about authentic experiences. In addition, its intelligent itinerary planner helps users efficiently manage travel routes, schedule activities, and avoid overbooking. To further enhance safety, the platform provides detailed health precautions and local emergency resources, including medical centers and police contacts, ensuring that travelers feel secure throughout their journey.

Beyond logistics, WiseTraveler fosters cultural awareness and engagement by offering insights into local traditions and practices while allowing users to rate and review attractions, restaurants, and accommodations. Features like collaborative trip planning and real-time travel updates create a more interactive and engaging experience for travelers. By combining convenience, safety, and cultural immersion, WiseTraveler transforms travel planning from a stressful task into an enriching and seamless experience, ensuring that every adventure is both memorable and hassle-free.

2.2 Major Component Diagram (Hardware/Software)

To support the development and operation of the WiseTraveler platform, several key hardware components are required. Desktop computers are used by the development team for coding, debugging, and testing. These machines must have sufficient processing power, memory, and storage to handle the development tools and software dependencies needed for building the platform. The major functional components of our system, as illustrated in Figure 1, are divided into three layers. First, the Presentation Layer serves as the user interface where travelers interact with our web app, searching for destinations and receiving personalized recommendations. Next is the Application Layer, the backbone of the system, which integrates external APIs like OpenAI and Google Places. This layer facilitates communication between the APIs and our web server,

delivering the data and recommendations users need. Finally, the Data Layer is responsible for storing, managing, and processing all travel-related data. It ensures the information displayed on the web app is accurate, up to date, and readily available for seamless user interaction. Together, these layers work in harmony to provide an efficient and reliable travel planning experience.

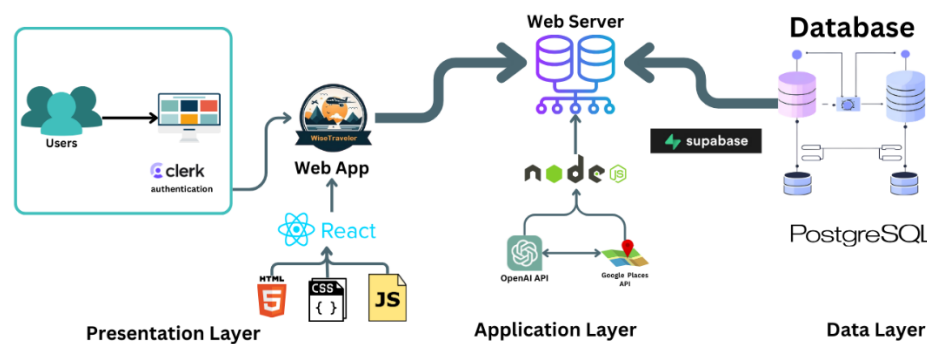


Figure 1: Major Functional Component Diagram

On the Front End, we utilize React, a JavaScript library for building user interfaces, along with HTML, JavaScript, and CSS, to create a dynamic, user-friendly experience for travelers. For the Back End, we rely on Node.js and Express, which provide a robust foundation for server-side logic and API development. Our Database is built on PostgreSQL with Supabase, offering the scalability and reliability needed to manage travel data effectively. We use Clerk for authentication to ensure secure user access. For Testing, we employ frameworks like Jest, Mocha, and Chai, supported by GitLab for continuous integration and deployment, ensuring high-quality code and streamlined development.

To facilitate collaboration and version control, we use GitHub, enabling efficient team workflows and codebase management. Our Integrated Development Environment (IDE) is Visual Studio Code (VSCode), a versatile tool that supports our coding needs with various extensions

and features. We also integrate third-party software, including the OpenAI API and Google Maps API, to enhance the platform with intelligent recommendations and location-based insights. Finally, for Hardware, we use desktop computers for development and testing. Together, these tools and technologies form the backbone of WiseTraveler, enabling us to deliver a powerful, engaging, and reliable platform for travelers worldwide.

3. Identification of Case Study

The main users of WiseTraveler are individuals seeking to enhance their travel experiences, immerse themselves in new cultures, and gain a deeper understanding of the destinations they visit. Travelers often struggle with finding authentic experiences, avoiding tourist traps, and navigating unfamiliar cultures and logistics. WiseTraveler simplifies this process by offering AI-powered recommendations, real-time travel insights, and personalized itineraries that help users explore with confidence.

Tourists frequently rely on scattered online resources and reviews to plan their trips, often leading to inconsistent or overwhelming information. WiseTraveler centralizes travel planning by providing tailored recommendations for authentic destinations, cultural experiences, and local attractions. Whether it's a business traveler attending corporate events, a student studying abroad, or a solo adventurer searching for hidden gems, WiseTraveler offers the necessary tools to create a seamless and enriching travel experience.

The platform's core feature is its ability to personalize every user's experience. WiseTraveler adapts to individual preferences, travel history, and interaction patterns, ensuring that recommendations and itineraries are uniquely crafted for each traveler. This personalized approach helps users discover the best experiences suited to their interests, whether they are looking for a relaxing vacation, a business trip with cultural insights, or a deep dive into local traditions and hidden spots.

The purpose of WiseTraveler is to enhance trip planning and navigation by offering personalized travel insights, real time updates, and local recommendations. The platform helps travelers balance safety, exploration, and cultural immersion by providing AI-powered suggestions and community-driven insights. To measure the effectiveness of WiseTraveler, a case study will be conducted using a pilot group of travelers, including business professionals, students, families, and solo adventurers. Participants will use the platform to plan trips, discover new experiences, and receive AI-driven recommendations tailored to their preferences. Their feedback will be collected through surveys, app analytics, and user interactions to refine and improve the platform's features.

As more users engage with WiseTraveler, their insights will be essential in expanding the platform's offerings. Because travel preferences and cultural norms vary across regions, customization options may be introduced to cater to different travel styles and destinations. Additionally, WiseTraveler has the potential to benefit key stakeholders such as local resort companies, Airbnb hosts, small business owners, and tourism boards. These groups can leverage the platform to attract visitors, promote unique experiences, and support sustainable tourism. By fostering connections between travelers and local businesses, WiseTraveler aims to create a more immersive and responsible travel experience.

4. Glossary

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.

Clerk: A modern authentication and user management platform that simplifies authentication with pre-built UI components and support for email/password, OAuth, magic links, and multi-factor authentication (MFA). It integrates seamlessly with WiseTraveler to handle user sign-ups, logins, and session management.

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.

Express.js: A web application framework for Node.js used for building RESTful APIs and handling server-side logic.

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.

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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