Lab 1 – Product Description

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1 Introduction

In 2023, approximately 48.98 million U.S. residents ventured overseas (3) to discover new cultures, visit family and friends, or attend to business. Additionally, within the first seven months of 2024, 79 million U.S. residents traveled internationally, which is approximately 11% more than in 2023 (15). While many travelers seek authentic cultural experiences, preparing such a trip can be daunting.

To plan a trip, travelers must conduct large amounts of research from multiple sources. Additionally, this information can be incomplete, outdated, or superficial paid reviews, leaving travelers with insufficient information on their destination. This insufficient information can expose tourists to great dangers involving the law and their health and safety, not to mention it can also lead to a less fulfilling trip. Furthermore, even if tourists are area of these risks, they are unsure how to combat them. As a result, when traveling to a foreign country, many travelers stick to crowded, popular cities and fall victim to tourist traps due to uncertainty about where to explore. Therefore, WiseTraveler, a new type of application, aims to help travelers obtain complete information from a single source, avoid tourist traps, and better plan their trips altogether.

WiseTraveler is an AI-driven travel application that provides a hassle-free, comprehensive experience, allowing travelers to focus on their journey. The application encourages exploration beyond mainstream tourist spots, offering unique, culturally immersive experiences while keeping travelers informed and safe. WiseTraveler consolidates all essential travel information so users can avoid juggling multiple sources of information. WiseTraveler keeps travelers informed and delivers tailored suggestions for destinations, attractions, and activities based on user preferences, making trip planning more straightforward and personalized.

2 WiseTraveler Product Description

WiseTraveler represents a new kind of approach to traveling. As a centralized AI travel guide, the platform aims to help users focus on planning their journey. The web application will be designed to provide various types of travel information into a single, user-friendly interface, thus eliminating the need to obtain information from multiple sources. Additionally, WiseTraveler will help users to stay safe and informed on the country they are visiting, and it will allow for personalized recommendations to ensure that each user has the best experience possible.

2.1 Key Product Features and Capabilities

The WiseTraveler application offers many key product features and capabilities. For example, WiseTraveler will be equipped with an AI feature, which users can use to help research and plan for trips. This AI assistant will be in the form of a chatbot that users can talk with. Users can ask this AI assistant travel related questions, and the AI chatbot will respond with tailored recommendations, as it will have access to information from each user's profile. Additionally, WiseTraveler also aims to be a centralized platform; the application will consolidate all types of essential travel information about various countries, and users will be able to directly access these forms. An interactive map will also be featured on the web application. This map will help aid in discovery of the country that each traveler is visiting.

Moreover, WiseTraveler aims to help users stay safe on their trips. Therefore, real-time health and safety alerts are another key feature of the web application. Each health and safety alert will be specific to the country that the user is visiting. Additionally, WiseTraveler will also feature a quiz that helps users determine what country they should visit; this quiz will aim to help users narrow down which destination they should visit.

Finally, WiseTraveler will utilize a review system that allows users to rate and review local attractions, as well as view other users' reviews for various types of attractions. The program will provide this type of review system to ensure that users do not fall into any tourist traps, and instead, they can visit the best attractions that the country has to offer.

2.2 Major Components – Hardware & Software

The software for WiseTraveler will be released as a web application. The purpose of this is so that it can be utilized on any device that has access to the internet, such as mobile devices, tablets, laptops, or PCs. Additionally, the application will be built using GitHub for version control; VSCode as the IDE; HTML, CSS, and JavaScript for front-end development; Python and JavaScript for back-end development; MySQL for the database; Jest, Mocha, and Chai for framework testing; and JSDoc for documenting the code.

Furthermore, the web application will be built using the Next.js framework and it will be hosted on Vercel. The program will also utilize Vercel's built-in database servers to store all user data, and the data will be retrieved using Express.js and Node.js. Finally, the application will utilize an OpenAI API, which will allow the users to have access to the AI chat feature, and WiseTraveler will also utilize a Google Map API, which will allow the users to have access to the interactive map feature.

3 Identification of Case Study

The main users for WiseTraveler are tourists and travelers of any nature, whether it be families, couples, solo travelers, people who are traveling for business, or any other type of traveler. The WiseTraveler project addresses the ever-changing needs of travelers and tourists by utilizing technology to solve various types of travel preparation challenges. As travelers seek

more authentic experiences, the demand for complete and user-friendly travel apps continue to grow. Therefore, WiseTraveler will be developed to fulfill these needs of travelers and tourists alike.

The case study group for the WiseTraveler application will consist of a diverse collection of people from different backgrounds. These participant users will frequently travel internationally, and they will consist of students studying abroad, solo travelers who are seeking authentic cultural experiences, and young professionals who are traveling for business. These participant users will consist of individuals who encompass various needs and expectations from the web application.

Throughout the case study, Team Yellow will collect user feedback about the various features and functionalities of the WiseTraveler application. For example, these users will be expected and required to provide feedback on the AI chatbot feature, the interactive map feature, the review system, the safety alerts functionality, and UI/UX of the web application. Team Yellow will actively engage participants throughout the case study by providing them with surveys and one-on-one discussions. The feedback that Team Yellow gains from this study group will assist in refining the features of the web application, enhancing the user interface, and better understanding various user preferences.

Finally, after WiseTraveler is officially launched, Team Yellow hopes to appeal to a wider variety of users from more diverse backgrounds. These users may consist of travel agencies who will utilize the web application to assist their clients, travel bloggers, tour guides, and educational institutions that are organizing study abroad programs. Ultimately, the goal of the WiseTraveler application is to create a product that appeals to a wide audience and that individuals can easily use to assist in their voyages.
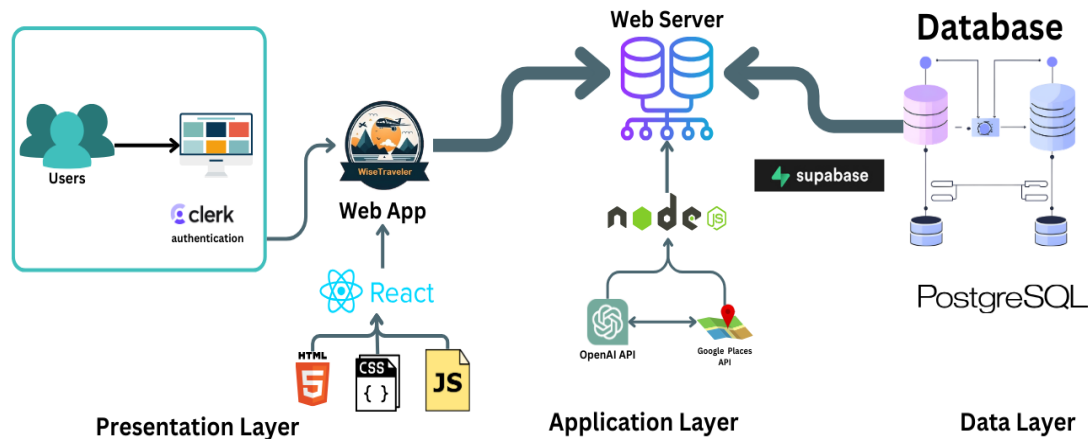
4 WiseTraveler Prototype Description

The WiseTraveler prototype will be a web application featuring a responsive design to ensure accessibility across various devices and screen sizes. The prototype will incorporate several key features to demonstrate the platform's capabilities. These features include user registration and login pages; an interactive quiz that provides the user with a location recommendation; the landing page of the web application featuring interactive UI/UX; and an AI travel chat option. The development of this prototype will involve addressing significant challenges. These include implementing data aggregation algorithms, and ensuring robust user privacy and security, while maintaining high performance and scalability. Additional prototype features include a trip schedule and itinerary optimization feature, a user review and rating system to provide authentic traveler perspectives, and an interactive Google map.

Figure 1: Algorithms
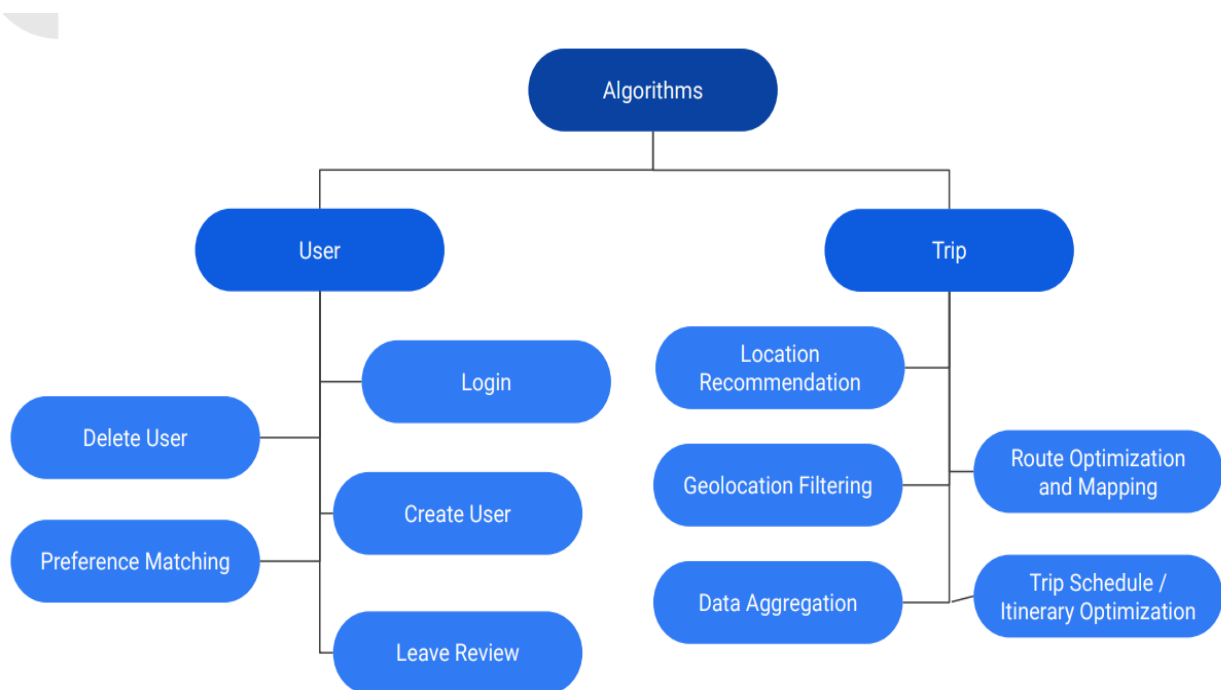
4.1 Prototype Architecture – Hardware & Software

Figure 2: Major Functional Components Diagram

The WiseTraveler prototype will be a web application with a responsive mobile and desktop design, ensuring that the application can be utilized across diverse types of smartphones, tablets, laptops, and desktops. When the user accesses the website, they will directly interact with the presentation layer. This presentation layer encompasses the UI/UX of the website, and the UI/UX will be developed using a React.js framework. On the application layer, the OpenAI API and the Google Map API will be implemented using Node.js. The user will be able to directly interact with the OpenAI API to discuss any travel related questions, and the user will be able to interact with the Google Map API to view various travel destinations. The data layer will encompass the PostgreSQL database; all user-related information will be directly sent to and stored in the database using Supabase. The database will utilize various tables that help store information relating to user accounts, trip planning, event information, site details, advisory data, user preferences, and reviews.

Figure 3: Database Schema
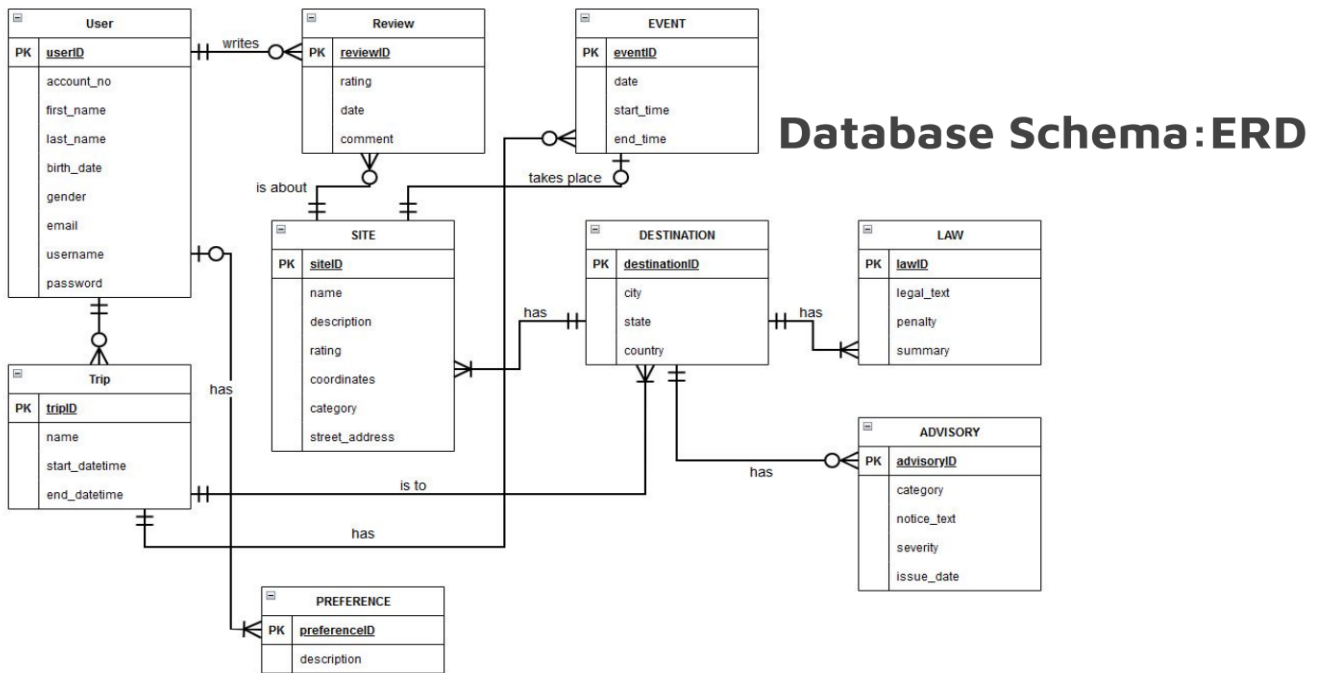
4.2 Prototype Features and Capabilities

The prototype features and capabilities for the WiseTraveler application will be demonstrated through the user registration and login pages, the interactive location recommendation quiz, the UI/UX for the web application, the AI travel chat, the implemented back-end database, the health and safety alerts feature, and the interactive map. These accomplishments are significant because they demonstrate that the WiseTraveler application has already begun the development phase and travelers can already utilize its features and capabilities. Furthermore, these features will be demonstrated during the CS 411W prototype demo presentations throughout the semester.

The prototype will address the CS 410 project risk mitigation by demonstrating key features that are essential for the application's functionality, including consolidating travel

related into a single platform through the interactive quiz, health and safety features, map, user

profiles, the AI travel chat, and the database implementation. Furthermore, these same features

also correspond to the functional goals. Together, the goals and objectives of the WiseTraveler

application offer an engaging, secure, and personalized experience for users. These features meet

both technical and functional requirements for travel planning.

Table of Comparison Between Prototype and Real World Product

	Feature	Prototype	RWP
User Interface	AI assistance for planning and research	Fully functional	Fully Functional
	Safety Concerns (dangerous animal sightings, criminal activity, etc.)	Partially functional	Fully Functional
	Health Risks	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
Testing	Unit Testing	Fully Functional	Fully Functional
	System Testing	Fully Functional	Fully Functional
	Integration Testing	Fully Functional	Fully Functional
Account Manager	Web Application	Partially Functional	Fully Functional
	Account Creation	Fully Functional	Fully Functional
	Login	Fully Functional	Fully Functional

4.3 Prototype Development Challenges

There will be several development challenges for the WiseTraveler application, such as data aggregation, the implementation of a personalization algorithm, user privacy and security, and performance and scalability. Data aggregation will pose a challenge due to integrating multiple API sources and ensuring data accuracy and timeliness. Moreover, the program will utilize diverse types of encryption algorithms to ensure user information and data remain secure; this can pose a challenge concerning user privacy and security. Finally, the application will also require real-time data processing, supporting concurrent users, and maintaining low latency, all of which will be challenging to overcome.

5 Conclusion

Altogether, WiseTraveler represents a solution to the challenges of travel planning. By integrating artificial intelligence, accessible information, and user-centric design, the platform aims to help travelers prepare for their travels. The software will help address critical gaps in current travel resources, which prioritizes safety, cultural understanding, and personalized exploration. As millions of people worldwide are constantly traveling, WiseTraveler will provide travelers with the knowledge needed to explore the world better and more authentically.

6 Glossary

Tourist Trap: An unfulfilling, and generally expensive, foreign attraction, activity, or event.

AI (Artificial Intelligence): A program that can perform tasks that normally require human intelligence.

API (Application Programmable Interface): A predefined piece of code that can be changed or manipulated to mold to a specific software application.

Centralized Platform: An application that concentrates large amounts of data in a single location.

Geolocation: The identification of the real-world geographic location of an object.

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