# **Software Requirements Specification**

# **PRJ566 – Fall 2024**

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| PRJ566 – Team No.7 | Team Members |
| Name of Project:  Tanken GO Travel Planning Web Application  Project Leader: Julian Huang  Last updated: 2024/09/11 | 1. Julian Huang  2. Rong Chen  3. Hsien-Ting Liao  4. Shan-Yun Wang |

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# **1 - Introduction/Overview - Document Information**

## 1.1 Document Authors

* Julian Huang
* Rong Chen
* Hsien-Ting Liao
* Shan-Yun Wang

## 1.2 Revision History

|  |  |
| --- | --- |
| Week 02 | 1. Introduction/Overview: (ongoing)  1.1 Document Authors: Completed  1.2 Revision History (ongoing)  1.3 Document Conventions: Completed  1.4 Document Purpose: Completed  1.5 Intended Audience: Completed  1.6 Group Agreement: Completed |
| Week 03 | 2.1 Project Proposal: Completed |
| Week 04 | 2.2 Stakeholders and Users  2.5 Project Scope  2.6 System Risks  2.7 Operating Environment |
| Week 05 |  |
| Week 06 |  |
| Week 07 |  |
| Week 08 |  |
| Week 09 |  |
| Week 10 |  |
| Week 11 |  |
| Final |  |

## 1.3 Document Conventions

* Main heading font size 20, sub heading size 16, body text size 12
* Any text in red indicates an exception or error
* Any text in blue is in-progress
* Any text highlighted in yellow or **bold** is an important point
* Any text in green was recently added
* Any text *italicized* represents definitions
* Any text with ~~strike-through~~ is deleted

## 1.4 Document Purpose

The purpose of this document is to provide a comprehensive overview of the requirements, functionalities, and structure for the development of the **Tanken GO** Travel Planning Web Application. It outlines the goals, intended features, user needs, and technical specifications, serving as a guide for developers, stakeholders, and project managers to ensure the successful implementation and delivery of the project. The document also defines the *project scope*, *system risks, and design elements*, helping to align the development process with the expected outcomes.

## 1.5 Intended Audience

* **Project team members** (developers, designers, and project managers) will use this specification as a guideline for the development and implementation of the **Tanken GO** Travel Planning Web Application.
* **Stakeholders** include the **CEO**, project sponsor, and other key personnel who require an understanding of the *project’s scope*, *objectives, and functional requirements*.
* **End-users** who are interested in understanding how the system will address their needs.
* **Faculty** and **project supervisors** overseeing the progress and ensuring the project meets academic and professional standards.

## 1.6 Group Agreement

**TEAM AGREEMENT**

**Team #: 7**

**Project Title: Tanken Go Travel Planning Web Application**

**Project Time Frame:**

**Team Members: Julian Huang | Rong Chen | Hsien-Ting Liao | Shan-Yun Wang**

**Team Leadership: Julian Huang**

**Team Functions:**

* We will share information through MS Teams, OneDrive, WhatsApp, e-mails, and meetings
* We will communicate progress and share files through MS SharePoint
* We will manage project documentation and track changes using GitHub for collaborative editing and version control

**Team Meetings: Every Wednesday 12:40pm**

**Team Problems: N/A**

**Team Commitment**

The undersigned members agree to work together on the project until the end of the PRJ666 next Semester. They recognize that as a team and individually they are responsible for the quality of all deliverables.

**Name**  **Date**

|  |  |
| --- | --- |
| **Julian Huang** | 2024/09/11 |
| **Rong Chen** | 2024/09/11 |
| **Hsien-Ting Liao** | 2024/09/11 |
| **Shan-Yun Wang** | 2024/09/11 |

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# 2 - Project Overview

## 2.1 Project Proposal

### Project Background

As self-planned trips gain popularity, many existing travel platforms overwhelm users with cluttered interfaces and lack personalization. Travelers today seek simple, intuitive tools that provide tailored recommendations for a seamless planning experience.

**Tanken GO** was created to meet this need by offering an AI-powered platform that simplifies trip planning. It provides customized itineraries, interactive maps, and real-time cost estimations, addressing the growing demand for personalized, user-friendly travel solutions.

### Problem Statement

|  |  |
| --- | --- |
| **The Problem of:** | Planning a trip through existing platforms can be overwhelming, time-consuming, and lacks personalization, making it difficult for travelers to create a customized travel experience that meets their specific needs. |
| **Affects:** | Travelers who prefer self-planning but struggle with the complexity of traditional travel websites, as well as stakeholders such as travel businesses and service providers looking to offer personalized experiences. |
| **The impact of which is:** | Users face frustration due to overwhelming options, poor user interface, and a lack of tailored recommendations, leading to dissatisfaction and inefficient trip planning. |
| **A successful solution would:** | Provide a simplified, AI-powered platform that offers personalized trip recommendations, customized itineraries, and intuitive navigation, enhancing the overall travel experience by saving time, reducing stress, and ensuring the trip aligns with individual preferences. |

### Product Vision

|  |  |
| --- | --- |
| **For** | Travelers who prefer customized trip planning can use AI to create personalized travel itineraries. |
| **Who** | Have difficulty navigating complex and cluttered travel planning websites and desire a more efficient, user-friendly solution that caters to their specific travel preferences. These travelers seek a platform that simplifies the planning process, offering tailored recommendations and seamless trip management. |
| **The Product Name** | **Tanken GO** - Travel Planning Web Application |
| **That** | Provides AI-powered trip recommendations, customizable itineraries, interactive maps, and cost estimations. |
| **Unlike** | Traditional travel websites that are cluttered and difficult to navigate. |
| **Our product** | Offers a simplified, personalized, and community-driven approach to travel planning. |

## 2.2 Stakeholders and Users

|  |  |
| --- | --- |
| **Stakeholder Name/Identifier** | **Category** |
| CEO (Chief Executive Officer) | Yasser Elmankabady |
| Construction Manager and Scheduler | Administration |
| Schedulers | Schedule the whole project and deadline |
| Cost Accountant | Manages Budget and Cost Control |
| Project Leader | Coordinates Development Efforts |
| Developers | Whole development member |
| UI/UX Interface | UI Designer |
| Quality Assurance (QA) Tester | System Functionality and Minimizes Bugs |

## 2.3 Functional Requirements

These specify what the software should do, such as features, interactions, and user interfaces.

## 2.4 Nonfunctional Requirements

Operational, Performance & Security Requirements

## 2.5 Project Scope

**1. Project Objectives:**

To develop a user-friendly web application that empowers travelers to plan their own trips efficiently, providing personalized recommendations and essential tools for trip management

**2. Deliverables:**

* **Functional Website**: A fully operational web application for trip planning
* **Reports**: Excel and PDF reports Business Proposal, Software Requirements Specification, Data Models such as activity diagram and program flow, and Video Presentation

**3. Project Boundaries:**

* **Included Features:** 
  + **Multi-Channel User Registration**
    - Users can easily register via Google, Facebook, or email, ensuring a seamless onboarding process
  + **Comprehensive Search & Filter for Points of Interest**
    - Users can search for points of interest with advanced filters, allowing them to effortlessly add locations to their trip plans based on preferences such as likes or budget
  + **Interactive Google Map Integration**
    - The platform includes an interactive map powered by Google Maps, enabling users to visualize and explore potential travel destinations in real-time
  + **AI-Powered Trip Planner**
    - Users can ask for personalized trip recommendations via a ChatGPT-integrated AI-powered trip planning assistant, which could provide but not limited to the following suggestions:
      * Popular Destinations
      * Packing Recommendations
      * Itinerary Suggestions
      * FAQ-Based Interaction
      * Best Travel Times
      * Restaurant/Hotel Suggestions
  + **Trip Sharing and Customization**
    - Users can share their trip plans with others on the website, allowing other users to select from popular trips suited to their preferences
  + **Community Feedback**
    - Users can engage with the community by liking and commenting on other trip plans. Popular trip plans are sorted based on likes, giving users insight into trending travel ideas
  + **Transportation Mode Filters**
    - Users can filter their trip plans by their preferred mode of transportation (e.g., car, train, walk), allowing for tailored itineraries that fit their needs and preferences
  + **Trip Cost Estimation**
    - The platform includes a trip cost calculator that estimates total expenses, including transportation, food, and attractions, helping users stay within their budget
* **Excluded Features:**
  + Booking of flights and hotels at the destinations, the app is solely focused on trip planning

**4. Project Constraints:**

* **Data Privacy Compliance**: The web application must adhere to data privacy regulations regarding user information collection and storage from third-party services
* **Technical Limitations**: Constraints imposed by third-party APIs, such as data availability

**5. Project Assumptions:**

* **API Functionality**: It is assumed that all third-party integrations (Google Maps, OpenAI) will function as intended without significant downtime.
* **Team Availability**: Team members will be available and committed throughout the project timeline

**6. Key Stakeholders:**

* **Internal Stakeholders**:
* **Julian Huang (Team Leader)**: Overall project oversight and coordination.
* **Rong Chen (Developer)**: Development of user interaction features and AI integration.
* **Hsien-Ting Liao (Developer)**: Backend development, focusing on security and cost estimation features.
* **Shan-Yun Wang (Developer)**: Front-end design and user experience enhancements.
* **External Stakeholders**:
* **Professor Yasser Elmankabady:** Providing guidance and feedback throughout the project
* **Potential Users** - Actively participating in testing phases to ensure the application functionality meets user needs and expectations

**7. Project Timeline:**

|  |  |
| --- | --- |
| Week 3 | Project Overview |
| Week 5 | Requirements Elicitation: Functional & non-functional |
| Week 6 | Activity Diagram and Wireframes/Mock-ups |
| Week 7 | User stories, use case specifications, mockups, and system use case diagrams |
| Week 8 | Finalized PPT System Mockups/wireframes (Prototype) and Video Development |
| Week 10 | Database design: ERD and Data Dictionary |
| Week 12 | Waterfall Implementation Schedule using MS Project tool |
| Week 13 | Final video presentation |

**8. Project Risks:**

* **Lack of Experience with Development Tools**:
* The team lacks experience with AWS deployment and cost management methodologies. This may lead to difficulties in optimizing cloud infrastructure and controlling costs. Completing the current AWS course by the end of the semester will help mitigate these risks before full-scale project development begins
* **Unforeseen Delays in Milestones**:
* Project timelines may be affected by team members’ availability, technical challenges, or unexpected complications, which could cause delays in reaching key project milestones
* **Scope Creep**:
* As the project progresses, there may be a tendency to introduce additional features or expand the project beyond its original scope. This could lead to increased development time, budget overruns, and difficulties in meeting the original deadlines if not carefully managed

**9. Resource Requirements:**

* **Personnel**: Julian Huang, Rong Chen, Hsien-Ting Liao, and Shan-Yun Wang (developer and designer)
* **Equipment**: AWS for hosting, OpenAI for AI functionalities, and GitHub for version control
* **Material**: Course templates and any necessary design software for prototyping

**10. Quality Standards:**

* **Usability**: Follow best design practices to ensure intuitive user navigation and interaction.
* **Testing**: All unit tests must pass with minimal bugs, ensuring system stability and performance.
* **Security**: Implement security best practices to protect user data and ensure the safe use of AI functionalities.

**11. Approval Criteria:**

* The project meets all functional and non-functional requirements as outlined
* The project is reviewed and approved by the project stakeholders, including the CEO and faculty members
* The system passes all user acceptance tests and security evaluations

**12. Communication Plan:**

* Weekly team meetings every Wednesday at 12:40 pm.
* Regular updates through MS Teams and WhatsApp.
* Documentation and project progress tracked via GitHub and MS SharePoint
* Urgent updates will be communicated through emails to all team members and stakeholders.

**13. Change Control Process:**

1. Member request to modify the project plan.
2. Key stakeholders will review the request and ensure that is executable
3. Approval the requirement and implement the change into the project plan

**14. Dependencies:**

* **Software**: Dependencies on external platforms like AWS, OpenAI, or APIs for specific functionalities
* **Resource availability**: Dependencies on other teams or departments for resources such as additional developers, testers, or hardware

**15. Exit Criteria:**

* All deliverables, including the system, documentation, and reports, must be completed and handed over
* The final working system will be delivered to users, with adequate training and support provided to ensure effective usage

## 2.6 System Risks

|  |  |
| --- | --- |
| **Risk** | **Response** |
| Real-time Google Map may lead to dependency on their APIs, introducing issues such as availability or up-to-date information | Implement robust error handling for API calls and set up notifications to alert the team of any integration failures. Establish caching mechanisms to store essential data temporarily when APIs are down. Regularly monitor external API services for changes and update the platform accordingly |
| If the user base grows the backend architecture may not be able to handle increased traffic | Ensure backend services are easily scalable by utilizing cloud services |
| The system collects and processes sensitive user data, including through third-party integrations (e.g., Google, Facebook). If the platform fails to comply with data privacy regulations (e.g., GDPR, CCPA), it may lead to legal issues, financial penalties, or loss of user trust | Implement strict data encryption and anonymization practices. Regularly audit the system for compliance with relevant regulations. Ensure that user consent is clearly obtained for any data sharing. Set up monitoring tools to identify and address any potential vulnerabilities in real-time |
| The AI-Powered Trip Planner may produce inaccurate or incomplete trip planning results, which could lead to user frustration and loss of trust in the platform's functionality | Continuously improve and train the AI model based on user feedback and data collection. Ensure that fallback solutions (e.g., manual trip planning tools) are available in case the AI-generated results are not satisfactory. Conduct thorough testing on AI predictions with various scenarios before full deployment |

## 2.7 Operating Environment

**Hardware:**

* **Client**:
  + Desktop and mobile devices with modern web browsing capabilities, supporting HTML5, JavaScript, and CSS3
  + Recommended Screen Resolutions: 1920x1080 or higher for desktops; adaptive layout for mobile devices
* **Server**:
  + Cloud-based servers (e.g., AWS EC2 instances) with the necessary capacity to handle traffic, API requests, and storage for trip data
  + Backup servers for redundancy and high availability, especially for critical services like the database

#### **Software:**

* **Client**:
  + **Web Browsers**: Latest versions of Chrome, Safari, Firefox, Edge, or Brave, supporting ES6+ JavaScript standards
* **Server**:
  + **Backend**: Node.js with Express.js for managing API requests and handling business logic
  + **Database**: Cloud-hosted PostgreSQL for relational data, or MongoDB for NoSQL requirements, providing scalability and flexibility
  + **AI Integration**: Python (e.g., Flask or FastAPI) for running AI algorithms, interfacing with the Node.js backend
  + **Authentication**: OAuth 2.0 or JWT for secure user authentication and authorization, using services like Google, Facebook, or email-based sign-ups

#### **Network Connection:**

* **Client**:
  + **Internet**: Minimum 4G connectivity for mobile devices; broadband (10 Mbps or higher) recommended for desktop usage to handle real-time data updates and map rendering.
* **Server**:
  + **Network Speed**: High-speed, reliable internet (with low latency) for API calls, cloud database access, and real-time interaction with external services (e.g., Google Maps, AI services).
  + **Uptime & Latency**: Ensure 99.9%+ uptime and latency under 100 ms for optimal user experience.

#### **Cloud Services:**

* **AWS**:
  + **Compute**: EC2 instances for hosting the backend and AI components.
  + **Storage**: S3 for storing user data and media (e.g., trip photos, saved itineraries).
  + **Database**: RDS or DynamoDB for hosting the database.
  + **Scaling**: Auto-scaling groups to manage traffic surges.
* **OpenAI**:
  + **AI Services**: Use OpenAI’s APIs for generating AI-powered trip recommendations, integrated into the backend.

## 2.8 UI/UXD Interface Mock-ups

# **3 - Process and Data Modeling**

## 3.1 UML/DFD Modeling and Data Modeling

### Activity Diagrams and Data Flow diagram

## 3.2 Business Rules

|  |  |  |
| --- | --- | --- |
| Business Rule Number | Business Rule Description | Related UC |
| BR01 | User must provide a username, email and password to register for the app. | UC01 |
| BR02 | Post length can be no longer than 300 characters | UC02 |
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## 3.3 Use Case Specifications with corresponding interface mockups:

**Each use case needs to have the following:**

1- **Business Rules.**

**2- System Use Case Diagrams.**

**3- Use Case Descriptions.**

**4- Corresponding Mockups**

# 4 - Domain Class Diagram

# 5 - Database

# 6 - Work Breakdown Structure (WBS)

## 

## 6.1 Work Breakdown Structure

Sample WBS:

Diagram

Description automatically generated

# 7 - Milestones and Acceptance Criteria

* 1. Milestone one

Definition

Acceptance Criteria

* …
* ….
* ….
  1. Milestone Two
  2. Milestone Three
  3. ..
  4. …
  5. …
  6. ..
  7. ..
  8. ...etc.

# 8 - Implementation Schedule

Implementation Schedule using MS Project (Waterfall)

OR

Product Backlog (Agile-Scrum)

# 9 - Client / Faculty Sign-off

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

X .

Name of Client/Rep/Professor