**Software Requirements Specification for World Map Explorer**

**1. Introduction**

**1.1 Purpose**

This document outlines the specifications for the World Map Explorer, an inclusive and educational mapping tool designed for individuals with visual impairments as well as sighted users. The purpose is to detail the requirements for creating an accessible, user-friendly application that serves educational purposes and enhances the mapping experience for all users.

**1.2 Scope**

The project entails the development of the World Map Explorer, a digital map application offering features like navigation, filtering, search, zoom, bookmarks, distance calculation, layers selection, GPS location, customizable settings, and help documentation. It aims to be accessible, particularly focusing on users with visual impairments, while being beneficial for sighted users too.

**1.3 System Overview**

The World Map Explorer will be a web-based application leveraging open-source technologies and data from OpenStreetMap. It will include various accessibility features such as keyboard navigation and audio cues. The application will be developed using HTML, CSS, JavaScript, and React for the front end, with Supabase for backend functionalities.

**2. System Features**

**Feature 1: Navigation**

**Description**

The application provides three types of navigation modes: General Navigation, Inbound Navigation, and Adjustable Pointer Navigation, all designed to be accessible through keyboard shortcuts and audio feedback, catering to users with visual impairments. General and adjustable pointer will work simultaneously and Inbound navigation will enable when user selecting a place. These navigation methods will help users to get idea about places and their connections

**Functional Requirements**

1. FR1.1: The system shall allow users to navigate the map using keyboard arrow keys for directional movement.
2. FR1.2: The system shall provide audio feedback indicating the name and coordinates of the current location under the cursor.
3. FR1.3: In Inbound Navigation mode, the system shall restrict navigation within the boundaries of a selected area, providing boundary alerts via audio cues. Clicking backspace will disable boundary selection
4. FR1.4: Adjustable Pointer Navigation shall enable users to set a fixed starting point and adjust the endpoint by specifying distance and direction. And this distance and direction can be changed by either using keys or manually entering values. Here auditory feedback of the place will be place indicated by end pointer.

**Feature 2: Search Functionality**

**Description**

A search bar allows users to find specific places or locations, offering detailed information and accessible navigation options through audio cues

**Functional Requirements**

1. FR2.1: The system shall offer a text-based search function accessible with a keyboard shortcut.
2. FR2.2: Upon entering a query, the system shall present a list of relevant results, navigable via keyboard.
3. FR2.3: Selecting a search result shall center the map on the chosen location and provide an option to hear detailed information. Using arrow keys, the user can navigate among the details to be narrated.

**Feature 3: Zoom and Scale Adjustment**

**Description**

Users can zoom in and out of the map to adjust the scale for clearer visibility, controlled through keyboard shortcuts and featuring audio feedback on scale changes.

**Functional Requirements**

1. FR3.1: The system shall allow users to zoom in and out using designated keyboard shortcuts.
2. FR3.2: The system shall provide auditory feedback indicating the current scale when adjustments are made.

**Feature 4: Filtering Map Elements**

**Description**

This feature enables users to filter specific map elements such as rivers, islands, and administrative divisions, improving the focus on relevant geographical features.

**Functional Requirements**

1. FR4.1: The system shall offer a filter option to display selected types of map elements within a selected area.
2. FR4.2: Users shall be able to apply and remove filters using keyboard navigation

**Feature 5: Distance Calculation**

**Description**

A tool to calculate and display the shortest road and air distances between two points, including directional information, with results accessible through audio narration. An option to add more points between starting and end point also enabled

**Functional Requirements**

1. FR5.1: The system shall allow users to select a starting point and a destination to calculate distances.
2. FR5.2: The system shall provide the shortest road distance, air distance, and directional information between the selected points.
3. FR5.3: An option to add more points between starting and ending points, appropriate keyboard shortcuts also given. The distance will be the total distance travelled.

**Feature 6: Bookmarking Locations**

**Description**

Users can bookmark specific locations for quick access in future sessions, with bookmarks synchronized across devices.

**Functional Requirements**

1. FR6.1: The system shall enable users to bookmark locations on the map. Initially system saves all bookmarks in local storage but in case of log in the data must move into cloud.
2. FR6.2: Users shall be able to access, manage, and organize their bookmarks through the application interface.

**Feature 7: Customizable User Settings**

**Description**

A settings menu allows users to customize map settings and accessibility options, such as detail priority, custom key bindings, coordinate format and distance unit.

**Functional Requirements**

1. FR7.1: The system shall provide a settings menu accessible via keyboard shortcuts.
2. FR7.2: Users shall be able to customize their experience by changing settings such as detail narration order, GPS key activation, and coordinate format and distance unit.

**Feature 8: Help and Documentation**

**Description**

Comprehensive help documentation and a user tour introduce features and functionalities, ensuring users can effectively utilize the application.

**Functional Requirements**

1. FR8.1: The system shall include a help section with documentation on features, functionalities, and navigation.
2. FR8.2: A guided tour option shall be available for new users to familiarize themselves with the application interface and features.

**3. Non-functional Requirements**

**3.1 Performance**

* The application will respond promptly to user inputs, ensuring a smooth and efficient experience. Average response time must be in 2 seconds, users may feel annoyed if it takes more.

**3.2 Accessibility**

* Designed with accessibility at its core, the application will support screen readers, keyboard navigation, and offer audio cues for users with visual impairments.

**3.3 Compatibility**

* The application will be compatible with major web browsers and designed to be responsive across computer systems with attached keyboard.

**3.4 Security**

* User data, including bookmarks and settings, will be securely stored and managed

**4. User Interfaces**

**4.1 Main Interface**

* The main interface will feature a clean, accessible design with high-contrast options and large, easy-to-navigate elements. Which includes map, search bar and navigation icon. And buttons to zoom-in, zoom-out, find distance, filter, layers and GPS locator. A header with login, bookmark, help, and settings.

**4.2 Navigation Controls**

* Clearly labeled keyboard shortcuts and audio cues will support user navigation through the map.

**4.3 Settings Menu**

* A user-friendly settings menu will allow for customization of map features and other options.

**4.4 Help & Documentation**

* An interface will be there to list all terminologies and details of every feature

**5. System Architecture**

The World Map Explorer will utilize a client-server architecture, with the front end built using HTML, CSS, JavaScript, and React for dynamic user interactions. The back end, powered by Supabase, will handle data storage, authentication, and real-time updates.

**6. Conclusion**

The World Map Explorer is set to be a groundbreaking tool in making geographic information and navigation accessible to all, particularly benefiting those with visual impairments. Through careful planning, development, and testing, this application will offer an inclusive educational tool that enhances the mapping experience for every user.