**IMPLEMENTATION DETAILS**

**Opensource Technologies**

# **OpenStreetMap**

OpenStreetMap (OSM) is a collaborative, open-source mapping platform which provides a free, detailed, and dynamic map of the world. The data is accessible through various tools and APIs, enabling developers to integrate OSM maps into applications for navigation, geocoding, and spatial analysis. OSM has become a valuable resource with its collaborative and open nature promoting accessibility and customization.

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# **Nominatim**

Nominatim is a search engine for geographical features, often used for geocoding and reverse geocoding. It's an open-source software that converts addresses into geographic coordinates (latitude and longitude) and vice versa. Nominatim is commonly employed in mapping applications to translate user-inputted locations into map coordinates, enabling accurate placement on maps. This tool plays a crucial role in applications that require accurate and up-to-date location information, such as mapping services, navigation systems, and location-based search functionalities.

# **SupaBase**

Supabase is an open-source Backend as a Service (BaaS) platform that can serve as the backend infrastructure to store and manage geographic data and other relevant information. We can use the PostgreSQL database provided by Supabase to organize and manage this data efficiently.

Supabase provides a built-in authentication system, making it easy for developers to implement user authentication. It offers a simple and intuitive authentication API that developers can leverage to handle user sign-ups, logins, password resets, and other authentication-related tasks. It supports OAuth providers, such as Google, GitHub, and others. And also offers data validation and security features, ensuring that the stored information is accurate, reliable, and secure.

# **Overpass API**

Overpass API is a powerful and open-source tool that enables the extraction of detailed geographic data from the OpenStreetMap database. This data can include information about countries, cities, landmarks, and other points of interest. It allows developers to filter data based on accessibility-related tags in OpenStreetMap. It supports real-time data retrieval, ensuring that the information presented on the map is up-to-date.

Overpass API can seamlessly integrate with popular JavaScript mapping libraries, such as Leaflet or Mapbox, to visualize the retrieved geographic data. Developers can customize the map interface to ensure it is user-friendly.

# **Leaflet**

Leaflet is a lightweight and open-source JavaScript library for interactive maps, widely used in web applications. It allows developers for interactive map rendering and enables to customize markers and layers to convey information effectively. Leaflet can be integrated with data sources like Overpass API to dynamically fetch and display geographic data.

Developers can create custom controls and user interface elements with Leaflet to provide additional functionalities tailored to visually impaired users. This could include buttons for zooming, panning, or toggling specific layers for enhanced map exploration.

# **Implementation**

# **Front-End**

* **HTML**

Use semantic HTML tags to provide a meaningful structure to your page

* **CSS**

Apply styles that enhance readability and provide sufficient contrast.

* **JavaScript**

Powers the dynamic aspects of the application handling map interactions, user input, accessibility accommodations and communication with back-end services.

* **React.js**

React.js can be a preferred choice due to its component-based architecture, declarative nature, and extensive ecosystem. React's modular structure allows for the creation of accessible and reusable UI components, making it easier to implement interactive and customizable features for users with visual impairments.

# **Back-End**

* **SupaBase**

Supabase: Acts as an all-in-one back-end service, offering database storage, user authentication, and real-time updates to support user preferences and bookmarking features within the application.

Its integration with PostgreSQL ensures reliable data storage and retrieval.

It's user-friendly authentication system further facilitates secure access,