BELLSTECH

SCTP Industry Project 1: Executive Summary

Individual Project

Prepared By	
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Signature	
Date	**18/11/2024**

Instruction:

The Individual Project consists of THREE Parts. You must complete all tasks indicated in each part.

Enterprise Profile			
Name of Enterprise	**SG-finder**	**Type of Entity:**	SME/ ~~Non-SME~~ *(*Delete where applicable)*
Vision	**To empower travellers to explore Singapore effortlessly, unlocking the city's hidden gems and crafting unforgettable experiences.**		
Mission	**To be the go-to travel companion for Singapore visitors, providing a seamless and personalized experience through:** • **Comprehensive Mapping: Offering an interactive map that pinpoints places of interest, local attractions, and hidden gems.** • **Intelligent Recommendations: Utilizing advanced algorithms to curate tailored itineraries based on user preferences, interests, and time constraints.** • **Real-time Insights: Providing up-to-date information on opening hours, crowd levels, and special events to optimize the travel experience.** • **Local Expertise: Incorporating insights from local experts to offer authentic recommendations and insider tips.** • **Seamless Navigation: Integrating with public transport information and walking directions to ensure a smooth and hassle-free journey.**		

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Type of Business	€ Private Company € ~~Public Company~~	Type of Industry	TRAVEL
Customer Segment	**Singapore Tourists – digital literate and mainly understanding English / Chinese language.**		
Products/Services	**Travel guide mapping web app with TripAI Advisor (ChatGPT feature)**		

Part 1: Website Design Blueprint	

Identify the business and user requirements for your website project.	# Business Requirements:
	
	1. **Accurate and Up-to-Date Data:**
	   a) Maintain a comprehensive and accurate database of places of interest, attractions, restaurants, and accommodations.
	   b) Regularly update information on opening hours, contact details, and pricing.
	2. **User-Friendly Interface:**
	   a) Design an intuitive and visually appealing interface that is easy to navigate.
	   b) Ensure compatibility across various devices (desktop, mobile, tablet).
	3. **Personalized Recommendations:**
	   a) Develop algorithms to recommend personalized itineraries based on user preferences, interests, and time constraints.
	   b) Consider factors like budget, travel style, and specific interests.
	4. **Real-time Information:**
	   a) Provide real-time updates on traffic conditions, public transportation schedules, and event calendars.
	   b) Integrate with relevant APIs to ensure accuracy.
	5. **Offline Functionality:**
	   a) Allow users to access key information and maps offline for seamless navigation.
	6. **Multilingual Support:**
	   a) Offer support for multiple languages to cater to a diverse international audience.
	7. **Secure User Accounts:**
	   a) Implement robust security measures to protect user data and privacy.
	   b) Allow users to create accounts and save their preferences.
	8. **Monetization Strategy:**
	   a) Explore various monetization options, such as advertising, premium subscriptions, or partnerships with local businesses.

User Requirements:

- **Easy Navigation:**
    - Simple and intuitive interface to find information quickly.
    - Clear categorization of places of interest.
- **Personalized Recommendations:**
    - Tailored suggestions based on individual preferences and interests.
    - Ability to customize itineraries.
- **Real-time Information:**
    - Up-to-date information on opening hours, crowd levels, and transportation options.
    - Timely notifications about changes or disruptions.
- **Offline Access:**
    - Ability to access essential information and maps without an internet connection.
- **Multilingual Support:**
    - Information and interface available in multiple languages.
- **Secure and Private:**
    - Protection of personal information and preferences.
- **Community Features:**
    - Option to share experiences, reviews, and photos with other users.
    - Ability to connect with other travelers.
- **Customer Support:**
    - Reliable and responsive customer support channels.
- **Accessibility:**
    - User-friendly interface for people with disabilities.

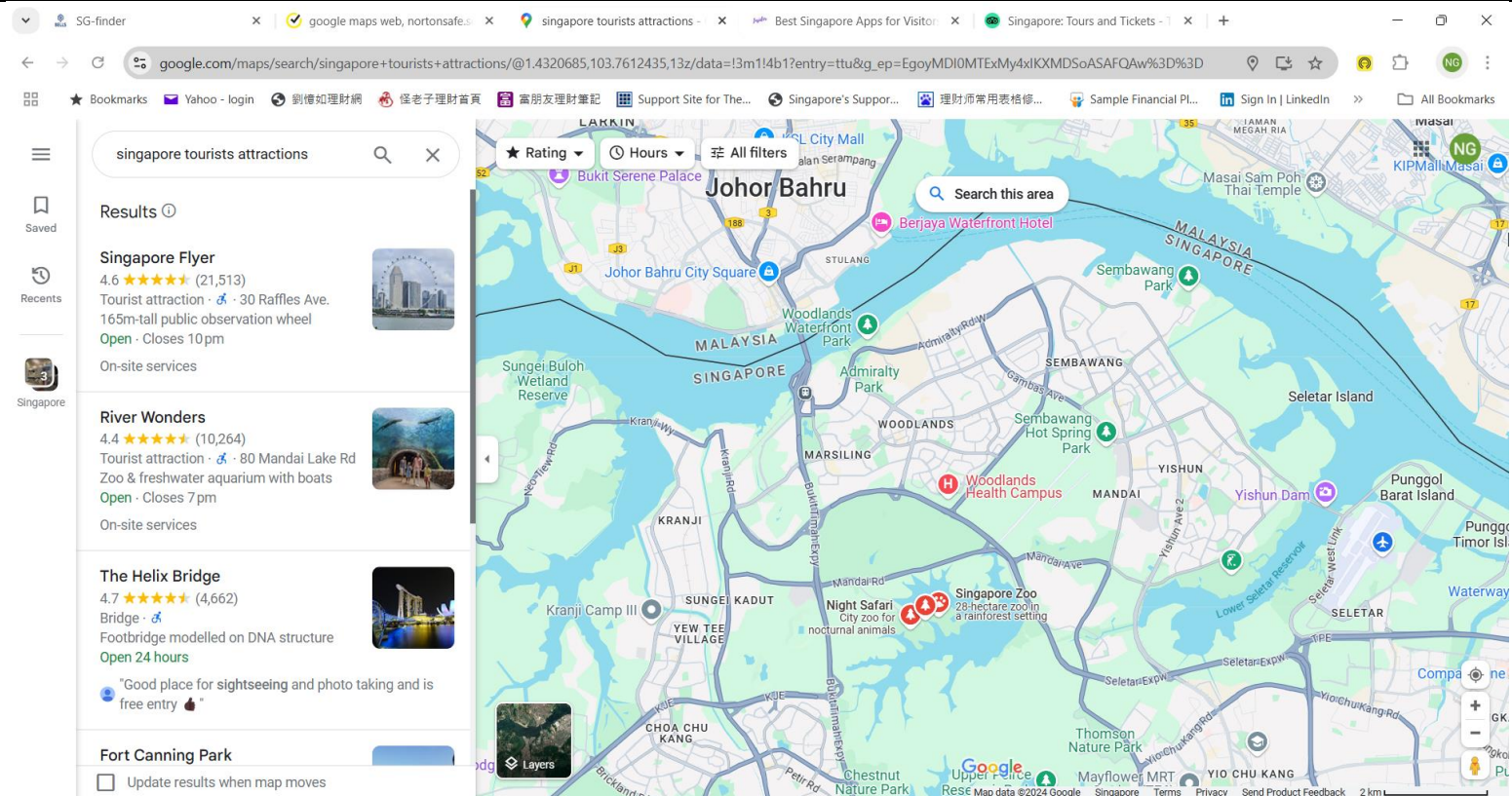| Define the purpose, target audience, and key features	# Purpose:
	
	The primary purpose of this travel guide mapping website is to provide Singaporean tourists with a comprehensive, user-friendly, and personalized platform to explore the city-state. It aims to enhance their travel experience by offering essential information, tailored recommendations, and interactive maps.
	
	# Target Audience:
	
	The target audience for this website includes:
	
	• **Domestic Tourists:** Singaporean residents exploring their own country.
	• **International Tourists:** Foreign visitors seeking to discover Singapore's attractions and cultural experiences.
	
	# Key Features:
	
	1. **Interactive Maps:**
	    o Detailed maps of Singapore, highlighting points of interest, attractions, and neighborhoods.
	    o Customizable map layers to filter information based on user preferences (e.g., food, shopping, culture).
	    o Real-time traffic updates and public transportation information.
	    o GPS-enabled navigation to guide users to their destinations.
	2. **Personalized Recommendations:**
	    o AI-powered recommendation engine to suggest itineraries based on user interests, time constraints, and budget.
	    o Customized recommendations for different traveler types (e.g., families, couples, solo travelers).
	    o Ability to save and share personalized itineraries.
	3. **Comprehensive Information:**
	    o Detailed descriptions of attractions, historical sites, and cultural landmarks.
	    o Up-to-date information on opening hours, ticket prices, and contact details.
	    o Reviews and ratings from other users.

	o Insider tips and local recommendations.
	4. **Booking and Reservation Services:**
	    o Integration with booking platforms to allow users to book accommodations, tours, and activities directly from the website.
	    o Real-time availability and pricing information.
	5. **Offline Access:**
	    o Downloadable maps and key information for offline use, ensuring a seamless experience even without an internet connection.
	6. **Multilingual Support:**
	    o Support for multiple languages to cater to international visitors.
	7. **Community Features:**
	    o User forums and social media integration to encourage user interaction and knowledge sharing.
	    o Ability to share travel experiences and photos.

Provide evidence of the research and review of the website design standards, methods, and best practices.	

Provide at least three standards and methods that align with your project.	# 1. Web Standards Compliance: • **HTML5 and CSS3:** Adhering to the latest HTML5 and CSS3 standards ensures cross-browser compatibility, semantic structure, and optimized performance.

- **W3C Validation:** Using W3C validation tools to check for errors and warnings in HTML and CSS code can help maintain high-quality standards.

2. Progressive Enhancement:

- **Gradual Enhancement:** Building a basic, functional website that works for all users, regardless of browser or device capabilities.
- **Progressive Addition of Features:** Adding more advanced features and interactivity for users with modern browsers and devices.
- **Prioritizing Core Functionality:** Ensuring that essential features like map display, search functionality, and basic information are accessible to all users.

3. Accessibility:

- **WCAG 2.1:** Following the Web Content Accessibility Guidelines (WCAG) 2.1 to make the website accessible to people with disabilities.
- **Semantic HTML:** Using semantic HTML elements to structure content and improve accessibility for screen readers.
- **Alternative Text for Images:** Providing descriptive alternative text for images to assist visually impaired users.
- **Keyboard Navigation:** Ensuring that all interactive elements can be accessed and operated using a keyboard.
- **Color Contrast:** Using sufficient color contrast between text and background to improve readability.

Choose and recommend appropriate design tools, themes, and plugins for your website project.

Design Tools:

- **Visual Studio Code:** A popular code editor with excellent support for HTML, CSS, and JavaScript. It offers features like syntax highlighting, code completion, and debugging tools.
- **Figma:** A powerful design tool for creating wireframes, mockups, and prototypes. It's great for visualizing the website's layout and user interface.

- **Adobe Photoshop:** While primarily a photo editing tool, Photoshop can be used for creating custom graphics and icons for your website.

Themes:

While there are no specific themes designed for plain vanilla JavaScript, HTML, and CSS projects, you can use CSS frameworks like Bootstrap or Tailwind CSS to create a consistent and responsive design. These frameworks provide pre-built CSS components and utility classes that can be customized to fit your website's specific needs.

Plugins:

While you won't be using traditional plugins for plain vanilla JavaScript, HTML, and CSS, you can leverage browser extensions and libraries to enhance your development process:

- **Browser Developer Tools:** Built-in tools in Chrome, Firefox, and other browsers for inspecting HTML, CSS, and JavaScript code.
- **Linter:** A tool like ESLint to check your JavaScript code for errors and potential issues.
- **Prettier:** A code formatter to automatically format your code, ensuring consistency and readability.
- **Version Control:** Git for managing your project's source code and tracking changes.

Additional Tips:

- **Responsive Design:** Ensure your website is optimized for different screen sizes and devices by using responsive design techniques.
- **Cross-Browser Compatibility:** Test your website in various browsers to ensure consistent performance and appearance.
- **Performance Optimization:** Minimize file sizes, optimize images, and use efficient JavaScript techniques to improve website loading speed.
- **Accessibility:** Prioritize accessibility by following WCAG guidelines and using semantic HTML.

	• **User Testing:** Conduct user testing to gather feedback and identify areas for improvement.

Explain your selections and how they align with the organisation's practice and design principles.	# Design Tool Selection:
	
	1. **Visual Studio Code:**
	    ○ **Alignment with Organizational Practice:** This versatile code editor is widely used in the industry and offers excellent support for web development. It's a popular choice among developers for its flexibility, customization options, and extensive plugin ecosystem.
	    ○ **Alignment with Design Principles:** By providing a clean and efficient coding environment, Visual Studio Code helps developers adhere to design principles like consistency, maintainability, and readability.
	2. **Figma:**
	    ○ **Alignment with Organizational Practice:** Figma is a collaborative design tool that enables designers and developers to work together seamlessly. It's particularly useful for creating wireframes, mockups, and prototypes, facilitating efficient design and development processes.
	    ○ **Alignment with Design Principles:** Figma's focus on user experience and design systems helps designers create visually appealing and user-friendly interfaces that align with the organization's design principles.
	
	# Theme and Plugin Selection:
	
	While there are no specific themes for plain vanilla JavaScript, HTML, and CSS, using CSS frameworks like Bootstrap or Tailwind CSS can significantly streamline the development process. These frameworks provide pre-built components and utility classes that can be customized to fit your website's specific needs.
	
	• **CSS Frameworks:**

o **Alignment with Organizational Practice:** CSS frameworks are widely adopted in the industry to accelerate development and ensure consistency. They provide a solid foundation for building responsive and accessible websites.
o **Alignment with Design Principles:** By providing a set of pre-designed components and utility classes, CSS frameworks can help developers adhere to design principles like consistency, modularity, and efficiency.

Browser Developer Tools:

- **Alignment with Organizational Practice:** These built-in tools are essential for debugging and optimizing web applications. They provide insights into HTML, CSS, and JavaScript, enabling developers to identify and fix issues quickly.
- **Alignment with Design Principles:** By providing tools for inspecting and modifying the DOM and CSS, browser developer tools help developers fine-tune the website's appearance and performance, aligning with design principles like visual appeal and efficiency.

Linter:

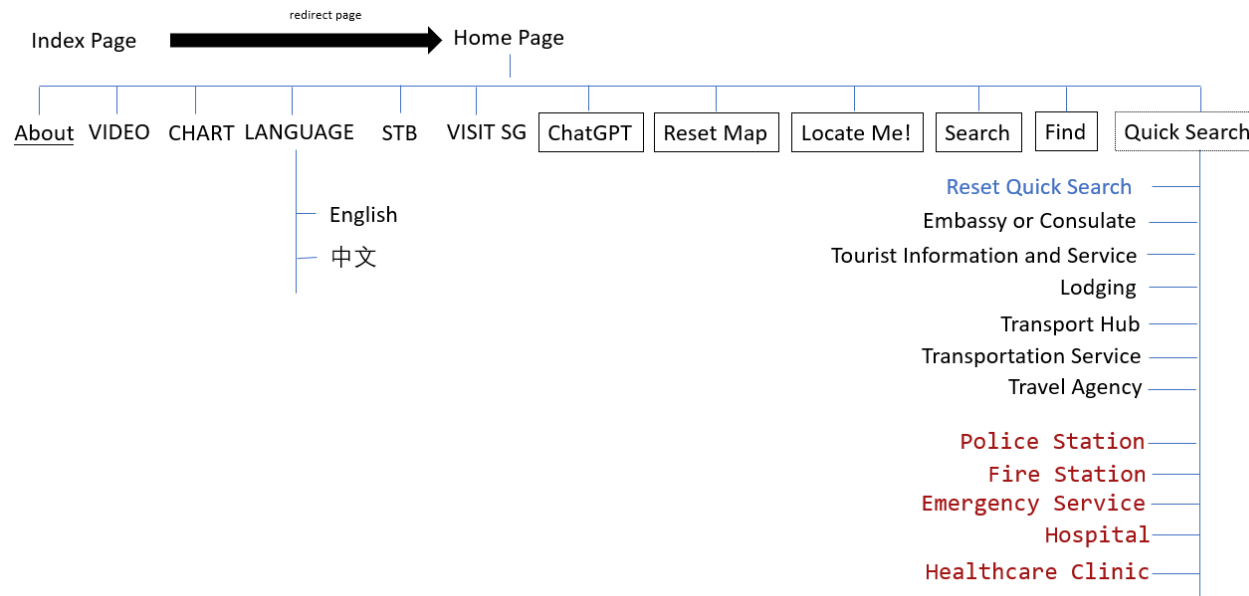- **Alignment with Organizational Practice:** Linters help maintain code quality and consistency by enforcing coding standards. They can identify potential errors, bugs, and style violations.
- **Alignment with Design Principles:** By promoting clean, readable, and maintainable code, linters contribute to the overall quality of the website and align with design principles like consistency and efficiency.

Develop a website design blueprint that outlines the structure, layout, and key components of your website. Include details about the chosen theme and framework.

Index Page → redirect page → Home Page

About · VIDEO · CHART · LANGUAGE · STB · VISIT SG · ChatGPT · Reset Map · Locate Me! · Search · Find · Quick Search

LANGUAGE:
- English
- 中文

Quick Search:
- Reset Quick Search
- Embassy or Consulate
- Tourist Information and Service
- Lodging
- Transport Hub
- Transportation Service
- Travel Agency
- Police Station
- Fire Station
- Emergency Service
- Hospital
- Healthcare Clinic

Part 2: Website Theme Customisation and Digital Marketing Integration

Customise a website theme to align with your project requirements. Modify the theme's appearance, layout, and typography. Document your changes.	
Select and configure plugins that support digital marketing efforts. This could include SEO, social	While using plain vanilla JavaScript, HTML, and CSS can provide a solid foundation for a website, you'll need to be more creative in implementing digital marketing features without relying on complex frameworks. Here are some strategies and tools you can consider: **SEO:**
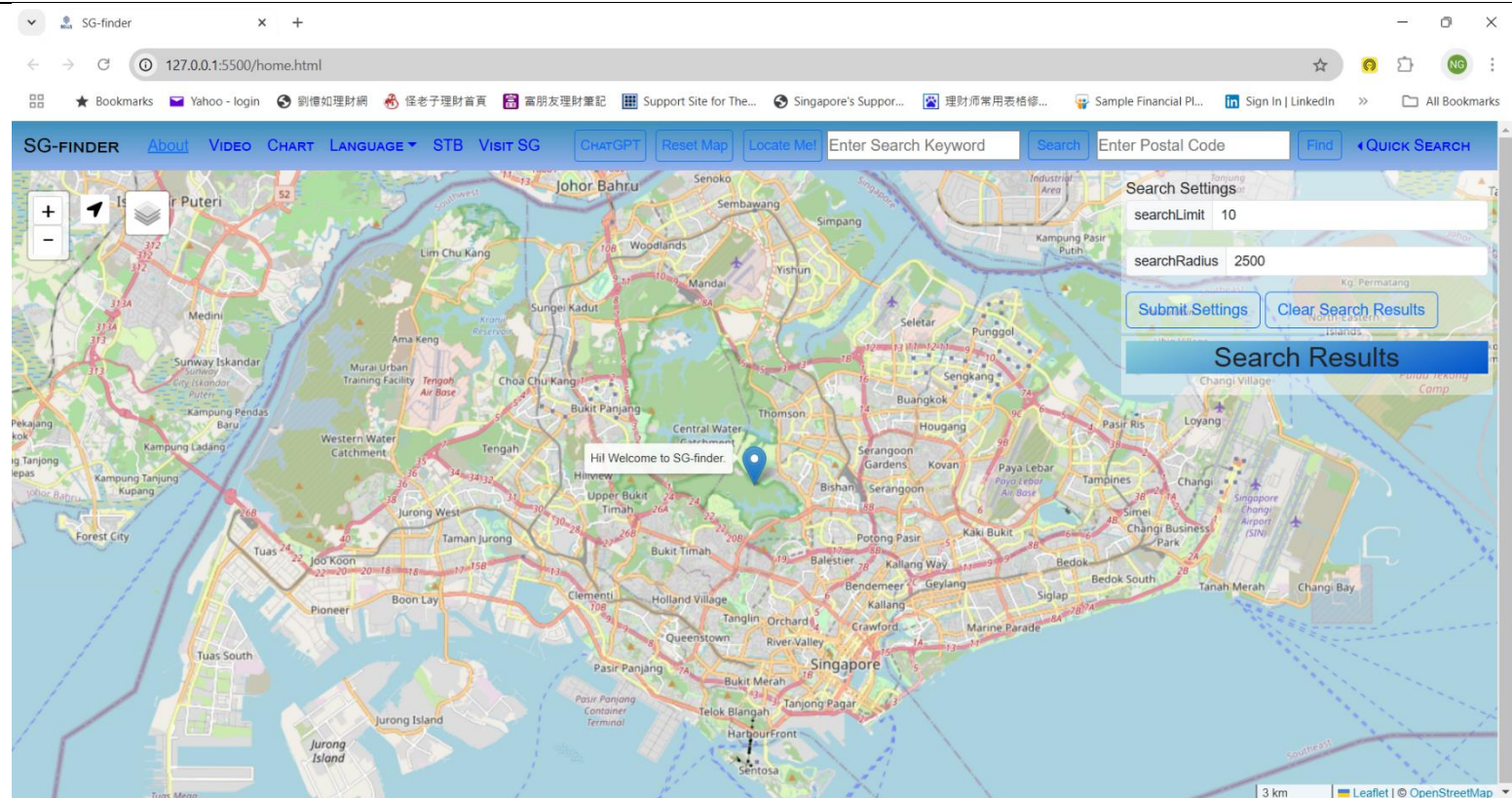
media integration, and contact forms.	**Semantic HTML:** Use semantic HTML tags like `<h1>`, `<h2>`, `<strong>`, and `<em>` to structure your content in a way that search engines can easily understand. **Meta Tags:** Manually add `meta` tags to the `<head>` section of your HTML document to specify the title, description, and keywords of your page. **URL Structure:** Use clear and concise URLs that include relevant keywords. **Image Optimization:** Compress images to reduce file size and improve page load speed. Use `alt` attributes to describe images for search engines and visually impaired users. **Sitemaps:** Create an XML sitemap and submit it to Google Search Console to help search engines discover and index your website's pages. **Social Media Integration:** **Social Media Sharing Buttons:** Use HTML and CSS to create custom social media sharing buttons. You can use JavaScript to track clicks and share counts. **Social Media Login:** While full-fledged social login might be challenging, you can create a simple login form that redirects users to social media platforms for authentication. **Contact Forms:** **HTML Form:** Create a basic HTML form with input fields for name, email, and message. **JavaScript Form Validation:** Use JavaScript to validate form input and display error messages. **Server-Side Scripting:** Use a server-side scripting language like PHP or Node.js to process form submissions and send emails. Alternatively, consider using a third-party form service like Formspree. **Additional Tips:** **Google Analytics:** While you can't directly integrate Google Analytics into plain vanilla JavaScript, you can use a simple analytics tracking script provided by Google to track page views, user behavior, and other metrics. **A/B Testing:** You can manually create different versions of your website and track their performance using Google Analytics.

- **Email Marketing:** Use a third-party email marketing service like Mailchimp or Constant Contact to capture email addresses and send marketing campaigns.

Remember that while using plain vanilla JavaScript, HTML, and CSS offers flexibility and control, it can be more time-consuming and challenging to implement advanced digital marketing features. Consider using a combination of these techniques and third-party services to achieve your desired results.

Part 3: Design documentation for the Website Project

Prepare a simple a design documentation for the website project that includes:

1. Overview of the design concept and objectives.	# Design Concept:
	The design concept for the Singapore Tourist Travel Guide Mapping website is to create a visually appealing, user-friendly, and informative platform that enhances the visitor experience. The website will feature a clean, modern design with a focus on intuitive navigation and easy access to essential information.
	Key Design Principles:
	Simplicity: A minimalist design approach will ensure a clutter-free interface, making it easy for users to find the information they need. **Responsiveness:** The website will be fully responsive, adapting to different screen sizes and devices (desktop, tablet, mobile) for optimal user experience. **Accessibility:** The website will adhere to WCAG 2.1 guidelines, making it accessible to users with disabilities. **Usability:** The user interface will be intuitive, with clear calls to action and easy navigation. **Visual Appeal:** A visually appealing design, incorporating high-quality images and engaging typography, will enhance the overall user experience.

Objectives:

1. **Provide Comprehensive Information:**
   - Offer detailed information on popular tourist attractions, including historical sites, cultural landmarks, and natural wonders.
   - Provide practical information such as opening hours, ticket prices, and contact details.
   - Offer recommendations for local cuisine, shopping, and entertainment.
2. **Create Personalized Experiences:**
   - Utilize user preferences and behavior to provide tailored recommendations.
   - Implement a user profile system to save favorite places and itineraries.
   - Offer personalized recommendations based on factors such as travel style, interests, and budget.
3. **Enhance User Experience:**
   - Implement a user-friendly interface with clear navigation and intuitive search functionality.
   - Optimize website performance for fast loading times and smooth interactions.
   - Provide offline access to key information for seamless user experience.
4. **Leverage Technology:**
   - Utilize mapping technology to provide interactive maps with real-time traffic updates and directions.
   - Integrate with social media platforms to encourage user engagement and sharing.
   - Implement a robust content management system to easily update and maintain website content.

By adhering to these design concepts and objectives, the Singapore Tourist Travel Guide Mapping website will provide a valuable resource for visitors, enhancing their overall travel experience and promoting tourism in Singapore.

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2. Detailed functional specifications, including a description of features and user interactions.

Functional Specifications:

1. Homepage

- **Hero Section:**

- o Prominent headline: "Explore Singapore, Your Way"
- o Engaging background image or video showcasing iconic Singapore landmarks
- o Search bar for quick destination search
- o Call-to-action button to start exploring
- **Featured Destinations:**
  - o A carousel or grid displaying popular tourist destinations with images and brief descriptions.
  - o Each destination link should lead to a detailed destination page.
- **Popular Itineraries:**
  - o A section showcasing pre-planned itineraries for different interests (e.g., culture, food, shopping).
  - o Each itinerary link should lead to a detailed itinerary page.

2. Destination Page

- **Destination Details:**
  - o Detailed description of the destination, including history, culture, and attractions.
  - o High-quality images and videos of the destination.
  - o Map with the destination's location and nearby attractions.
- **Things to Do:**
  - o List of popular activities and attractions in the area.
  - o Links to detailed information about each activity.
- **Nearby Attractions:**
  - o A list of nearby attractions, with links to their respective pages.
- **Reviews and Ratings:**
  - o A section for user reviews and ratings.
  - o Option for users to leave their own reviews.

3. Itinerary Page

- **Itinerary Details:**
  - o A detailed itinerary, including day-by-day plans.
  - o Information on transportation, accommodation, and dining options.

o Estimated budget for the itinerary.
- **Customize Itinerary:**
  o Option for users to customize the itinerary by adding or removing activities, adjusting the duration, or modifying the budget.
  o Ability to save customized itineraries.

4. Search Functionality:

- **Keyword Search:**
  o Users can search for destinations, attractions, or activities using keywords.
- **Filter Options:**
  o Users can filter search results by category (e.g., historical, cultural, natural), location, and budget.

5. User Profile:

- **Account Creation:**
  o Users can create accounts to save their preferences, itineraries, and reviews.
- **Profile Settings:**
  o Users can update their profile information, preferences, and password.
- **Saved Itineraries:**
  o Users can save and access their customized itineraries.
- **Review History:**
  o Users can view and edit their past reviews.

6. Offline Access:

- **Downloadable Maps:**
  o Users can download maps of specific destinations for offline use.
- **Offline Itinerary Access:**

	o Users can access saved itineraries offline.
	
	7. Interactive Map:
	
	 • **Zoomable Map:**
	  o Users can zoom in and out of the map to explore different areas.
	  o Map markers indicate points of interest.
	 • **Clickable Markers:**
	  o Clicking on a marker displays information about the corresponding point of interest.
	 • **Directions:**
	  o Users can get directions to specific destinations from their current location or another point of interest.
	
	User Interactions:
	
	 • **Clicking on links and buttons:** To navigate to different pages and sections of the website.
	 • **Searching for destinations and activities:** Using the search bar and filters.
	 • **Saving itineraries and reviews:** Creating and managing user profiles.
	 • **Zooming and panning the map:** Exploring different areas of interest.
	 • **Viewing and interacting with map markers:** Accessing information about specific locations.
	
	By implementing these features and user interactions, the Singapore Tourist Travel Guide Mapping website will provide a valuable resource for tourists, helping them plan their trips efficiently and enjoy their time in Singapore.

3. **Recommendations for website standards, methods, and tools.**	# Recommendations for Website Standards, Methods, and Tools **Standards and Methods** 1. **Web Standards Compliance:**

- o Adhere to the latest HTML5 and CSS3 standards to ensure cross-browser compatibility, semantic structure, and accessibility.
  - o Validate HTML and CSS code using W3C validation tools.
2. **Progressive Enhancement:**
  - o Build a core functionality that works on all devices and browsers, then progressively add features for modern browsers.
  - o Prioritize essential features like map display, search, and basic information.
3. **Accessibility:**
  - o Follow WCAG 2.1 guidelines to make the website accessible to users with disabilities.
  - o Use semantic HTML, provide alternative text for images, and ensure keyboard navigation.
  - o Test the website with assistive technologies.
4. **Performance Optimization:**
  - o Minimize HTTP requests, optimize images, and leverage browser caching.
  - o Minify and compress HTML, CSS, and JavaScript files.
  - o Use efficient JavaScript practices and avoid blocking rendering.
5. **Security Best Practices:**
  - o Protect against common web vulnerabilities like cross-site scripting (XSS) and cross-site request forgery (CSRF).
  - o Keep software and libraries up-to-date.
  - o Implement secure password hashing and storage.

Tools and Technologies

1. **Code Editor:**
  - o **Visual Studio Code:** A popular code editor with excellent support for HTML, CSS, and JavaScript. It offers features like syntax highlighting, code completion, and debugging tools.
2. **Version Control:**
  - o **Git:** A powerful version control system for tracking changes and collaborating with other developers.
3. **Task Runner:**
  - o **Gulp or Grunt:** Automate tasks like minification, concatenation, and linting to improve workflow efficiency.

4. **Testing Tools:**
   - **Jest:** A JavaScript testing framework for unit and integration tests.
   - **Selenium:** A web browser automation tool for testing user interactions.
5. **CSS Frameworks:**
   - **Bootstrap or Tailwind CSS:** These frameworks can help accelerate development and ensure consistent styling.
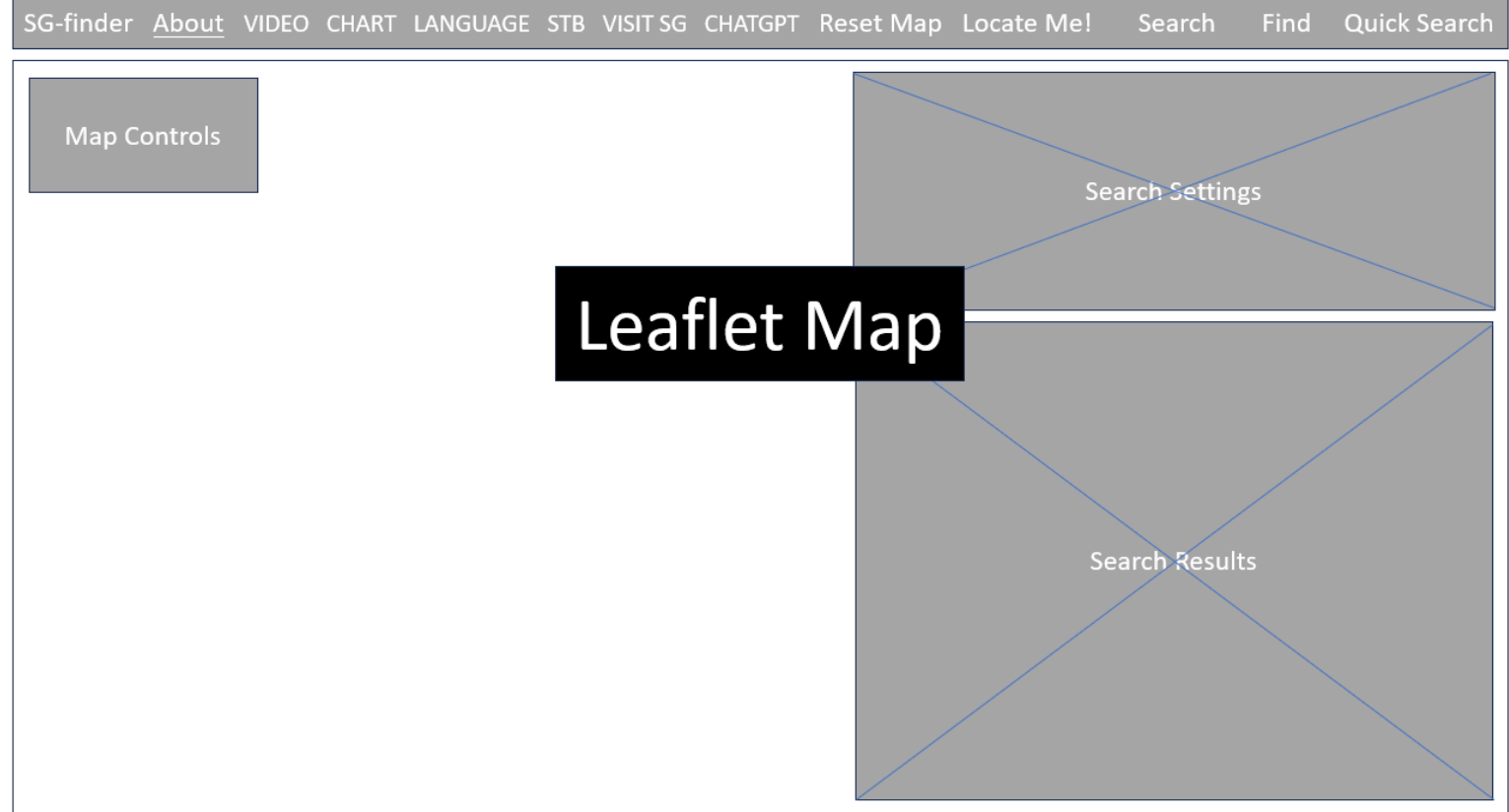6. **JavaScript Libraries:**
   - **jQuery:** A popular JavaScript library for DOM manipulation and AJAX requests.
   - **Lodash:** A utility library for functional programming and common tasks.
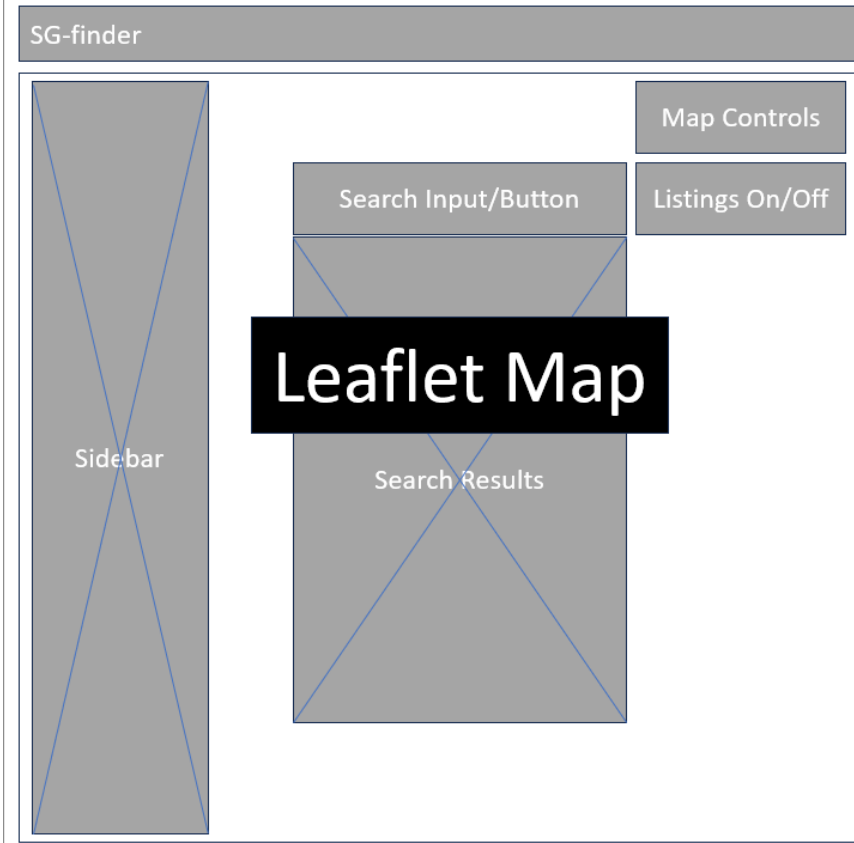7. **Mapping Libraries:**
   - **Leaflet or Mapbox GL JS:** Powerful JavaScript libraries for creating interactive maps.

By following these standards, methods, and using the recommended tools, you can develop a high-quality, accessible, and performant travel guide mapping website.

4. **A wireframe or flowchart illustrating the website's structure.**	SG-finder About VIDEO CHART LANGUAGE STB VISIT SG CHATGPT Reset Map Locate Me! Search Find Quick Search Map Controls Leaflet Map Search Settings Search Results **Laptop/Desktop devices -> UI design for large screens**

Mobile/Tablet devices -> UI design for small screens

5. A breakdown of trade-offs and their implications.	**Evaluating Trade-offs for Feature Implementation**

1. Bootstrap as CSS Framework

Functionality:

- **Pros:** Offers pre-built components like buttons, forms, and navigation bars, accelerating development.
- **Cons:** Might introduce unnecessary styles that need customization, potentially leading to bloated code.

Interoperability:

- **Pros:** Widely used and well-documented, ensuring compatibility with different browsers and devices.
- **Cons:** Overreliance on Bootstrap can limit customization and unique design.

Efficiency:

- **Pros:** Reduces development time due to pre-built components and responsive design features.
- **Cons:** Can increase website load times if not optimized, especially with large Bootstrap files.

Cost:

- **Pros:** Free and open-source, reducing development costs.
- **Cons:** Might require additional effort and time for customization and optimization.

2. AI Tool: ChatGPT

Functionality:

- **Pros:** Can generate human-quality text, such as descriptions, reviews, and itineraries, saving time and effort.
- **Cons:** Relies on the quality of the input data and the AI model's capabilities.

Interoperability:

- **Pros:** Can be integrated with various platforms and APIs to provide dynamic content.
- **Cons:** Requires careful integration to ensure seamless user experience and data privacy.

Efficiency:

- **Pros:** Automates content generation tasks, improving efficiency.
- **Cons:** Might require additional processing time and computational resources.

Cost:

- **Pros:** Free for basic usage, making it a cost-effective solution.
- **Cons:** Advanced usage or API access might incur costs.

3.Leaflet as Mapping Library

Functionality:

- **Pros:** Highly customizable and offers a wide range of features, including markers, popups, and layers.
- **Cons:** Requires more development effort compared to simpler mapping solutions.

Interoperability:

- **Pros:** Well-supported and widely used, ensuring compatibility with different browsers and devices.
- **Cons:** Might require additional configuration for specific map providers and features.

Efficiency:

- **Pros:** Can be optimized for performance by using techniques like lazy loading and tile caching.
- **Cons:** Complex maps with many layers and markers can impact performance.

Cost:

- **Pros:** Free and open-source, making it a cost-effective solution.
- **Cons:** Might require additional effort and expertise to customize and optimize.

4.FourSquare as Places API

Functionality:

- **Pros:** Provides a rich dataset of places, including venues, events, and user reviews.
- **Cons:** Relies on the accuracy and completeness of FourSquare's data.

Interoperability:

- **Pros:** Well-documented API and SDKs for easy integration.
- **Cons:** Rate limits and API key restrictions might limit usage.

Efficiency:

- **Pros:** Efficiently retrieves and processes location data.
- **Cons:** Can impact performance if used excessively or inefficiently.

Cost:

- **Pros:** Free for basic usage, with paid plans for higher usage limits.
- **Cons:** Additional costs might be incurred for premium features and increased usage.