Software Requirements Specification

for

Shell Today App

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Abstract

The Shell Today Web Application with Integrated Map Feature is an innovative and game-changing platform that aims to provide users with comprehensive and current information about the ever-evolving clean and sustainable energy sector. This software solution not only allows users to stay updated with the latest news articles on green energy but also offers a unique spatial perspective through its integrated map interface. By combining the power of dynamic article exploration with geographical insights, this platform empowers users to make informed decisions and actively contribute to the global shift towards clean and sustainable energy sources.

The main objective of the project is to develop a web application that prioritizes user needs and connects clean energy news with specific geographic locations. Users will be able to conveniently access a vast collection of news articles on clean energy, visually explore them on an interactive map, and effortlessly narrow down their search by filtering articles based on their regions of interest.

1.   Introduction

In an era defined by environmental consciousness and a pressing need for sustainable energy solutions, the Shell Today Web Application with Integrated Map Feature emerges as a powerful tool to foster awareness, understanding, and engagement in the world of clean energy. This transformative digital platform harmonizes the multifaceted landscape of clean energy news with the rich context of geographic visualization. The primary mission of this project is to craft a user-centric web application that fills a critical gap in the dissemination of clean energy information. It empowers users to navigate a wealth of clean energy news articles while affording them the invaluable perspective of geographic context. Users will effortlessly access an extensive repository of articles, harnessing the power of maps to filter and explore this knowledge base in an unprecedented manner.

1.1   Challenges

Development is not without its challenges, including data integration, geospatial data management, seamless user experience design, and scalability to accommodate a burgeoning user base. Cross-browser compatibility, performance optimization add further layers of complexity, curating reliable and current green energy news sources from diverse regions is a fundamental challenge. User interface design poses another hurdle, demanding an intuitive and user-friendly experience for users of varying technical backgrounds. Ensuring data privacy and security is paramount, necessitating robust protection measures and adherence to data privacy laws. Performance optimization is essential to handle the application's scalability as it manages a growing volume of articles and user traffic. Content moderation and user authentication further add layers of complexity, ensuring the quality and security of user interactions. Developing an effective recommendation engine, mobile responsiveness, and environmental impact assessment all require dedicated attention. Additionally, user education, legal compliance, and user support channels present challenges that must be thoughtfully addressed. Successful marketing, sustainability reporting, and continuous improvement are also integral for the project's long-term success. Each of these challenges demands careful consideration and expertise to create a robust and impactful application and for the successful execution of the project.

1.2   Solutions

The solutions for the challenges that will be incurred during the development process, a prototype has been decided.
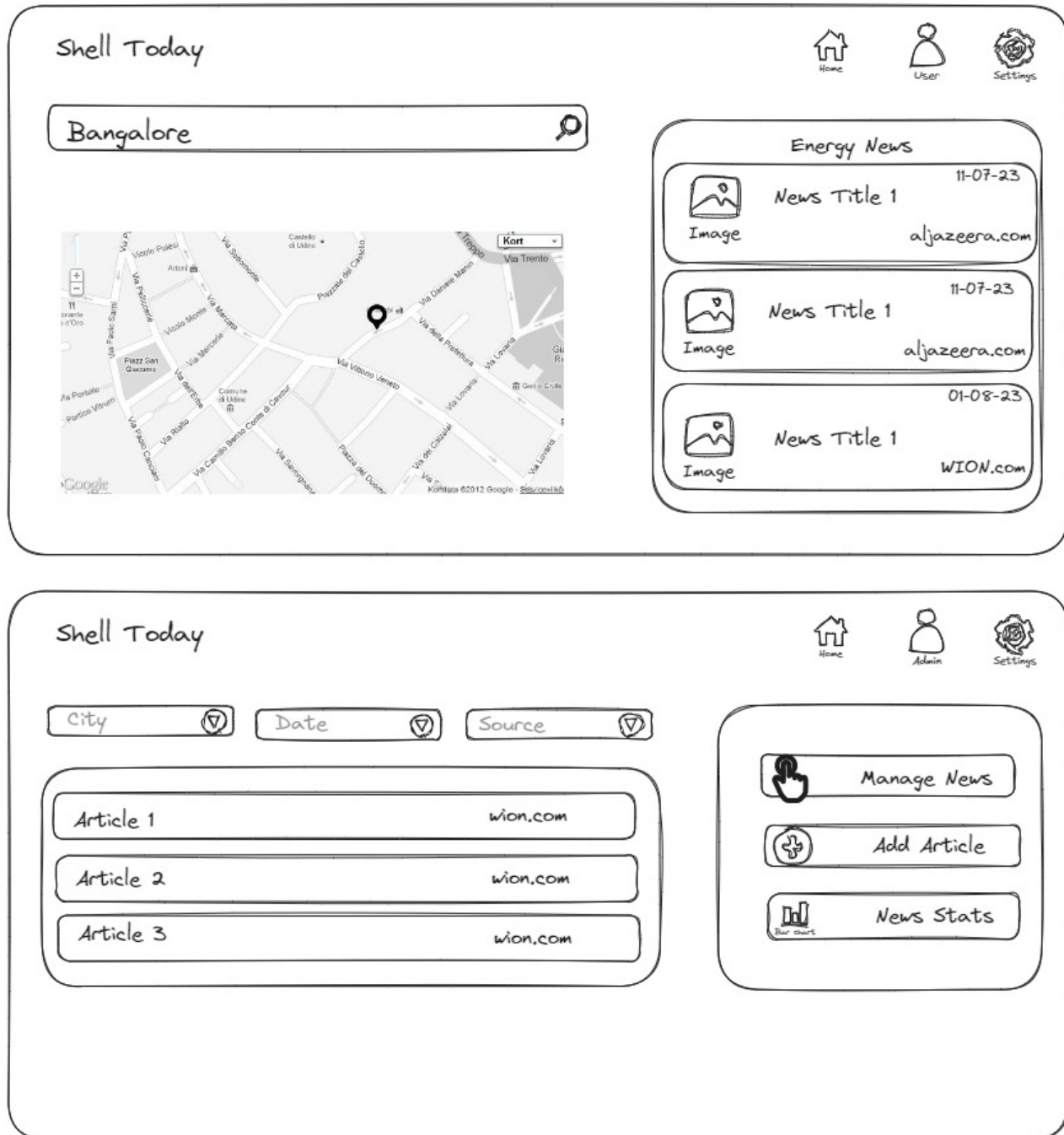
1. **News Browsing Functionality:** User Registration and Authentication: Users can register for accounts using their email or social media credentials. Authentication ensures secure access to personalized features.
   - News Feed: The application will provide a dynamic and user-friendly news feed. Users can access a vast repository of clean green energy news articles.

- Article Display: Each news article will be presented with detailed information, including a title, summary, publication date, source, and category tags.
- Pagination or Infinite Scroll: To facilitate smooth browsing, pagination or infinite scroll mechanisms will be implemented for easy navigation through the news feed.

2. **Integrated Map Feature:** Geographic Visualization: The integrated map will offer a geographic context for the news articles, with markers representing the locations of relevant stories.
   - Interactive Map: Users can interact with the map by zooming, panning, and clicking on markers to view articles associated with specific geographic regions.
   - Map Data Integration: Geographic data will be sourced from reliable mapping APIs to ensure accuracy and up-to-date information.
   - Region-Based Filtering: Users can filter news articles by selecting regions on the map, enabling them to focus on news pertinent to specific geographic areas.

3. **User Profiles and Personalization:** User Profiles: Registered users can create and manage profiles, providing the option to customize their usernames, passwords, and email addresses.
   - Notification Preferences: Users can personalize their experience by setting notification preferences, receiving updates on specific regions or topics of interest.

4. **Admin Features:** Content Moderation: Administrators will have access to content moderation tools to ensure the quality and accuracy of articles within the platform.
   - Analytics Dashboard: Admins can access an analytics dashboard to gain insights into user engagement, popular regions, and trending topics.
   - User Management: Admins can manage user accounts, including user roles and permissions.

5. **Technology Stack:**
   Frontend: HTML5, CSS3, JavaScript, React.js
   Backend: .NET C#
   Database: PostgreSQL
   Mapping API: Google Maps API (or alternative mapping service)

6. **Assumptions and Dependencies:**
   - Assumptions: It is assumed that users have access to a stable internet connection for seamless app usage.
   - Dependencies: The application relies on external data sources and APIs for news articles and map data, and thus, dependencies on the availability and reliability of these services exist.

7. **Future Enhancements:**

The scope includes the potential for future enhancements, such as incorporating additional news sources, extending map functionality, and implementing user-generated content features.

1.3   Project Scope

The scope of the project is vast and can evolve in several directions to have a more significant impact on environmental awareness and sustainability. Here are some potential future directions and enhancements for the project:

1. **Global Expansion**: Initially, the project could focus on specific regions, but the future scope may involve expanding its coverage to include a wider range of regions, countries, and languages, allowing users from all over the world to access green energy news relevant to their locations. Translate the application into multiple languages to make it more accessible to non-English-speaking users around the world.

2. **Multi-Platform Support:** Extend the project to mobile apps (iOS and Android) to reach a broader user base. Developing dedicated mobile applications can enhance user engagement and accessibility.

3. **Enhanced Personalization:** Continuously improve the recommendation engine to provide users with even more tailored content based on their interests, behavior, and environmental concerns. Implement features like personalized newsletters and notifications.

4. **Community Engagement:** Add social features like user forums, discussion boards, and user-generated content. Encourage community engagement and discussions around green energy topics, fostering a sense of belonging among environmentally conscious users.

5. **Environmental Impact Measurement:** Develop tools and features to help users track their own environmental impact, such as calculating their carbon footprint and suggesting ways to reduce it. Provide users with statistics on the collective impact of their eco-friendly actions through the platform, such as the reduction in CO_2 emissions or the number of trees saved.

6. **Partnerships and Collaborations:** Forge partnerships with environmental organizations, renewable energy companies, and government agencies to access more reliable data sources, expand the content library, and promote sustainability initiatives.

7. **Accessibility Features:** Ensure the application is accessible to individuals with disabilities by implementing accessibility standards and conducting regular accessibility audits.

8. **Energy-Efficient Technologies:** Investigate and implement energy-efficient server technologies and green hosting options to further reduce the carbon footprint of the application itself.

9. **Offline Access:** Enable users to save articles for offline reading, ensuring access to green energy news in regions with limited internet connectivity or during emergencies.

10. **Educational Resources:** Expand the educational component by adding comprehensive resources on green energy technologies, climate change, and sustainable living practices.

The future scope of the project depends on emerging technologies, user feedback, environmental developments, and evolving sustainability goals. Continuously adapting and expanding the project can help it remain a relevant and influential tool in the ongoing effort to address environmental challenges and promote green energy adoption.

2.   Requirements

2.1   Functional Requirements

The functional requirements are as follows:

1. **User Registration and Authentication:** Users should be able to create accounts with a valid username and password.

2. **News Content:** The app should fetch and display green energy news articles from various sources and categorize them by location.

3. **Geolocation Integration:** The app should have a map feature that displays the locations related to the news articles, such as where green energy projects are taking place.
    - Users should be able to filter news articles by location on the map.
    - Clicking on a location on the map should provide more information about the news articles related to that location.

4. **Content Management:** Administrators should have a dashboard for managing and curating news articles.
    - Admins should be able to add, edit, or remove articles and assign geolocations to them.

5. **Performance and Scalability:** The app should be optimized for performance and able to handle a growing user base and news content.
6. **Security:** Implement security measures to protect user data and prevent unauthorized access.
    - Ensure secure transmission of data between the client and server.
    - The user login details database should have encryption.

7. **Accessibility and Usability:** Ensure that the app is accessible to users with disabilities and complies with relevant accessibility standards.
    - Conduct usability testing to improve the user interface and user experience.

2.2   Non-Functional Requirements

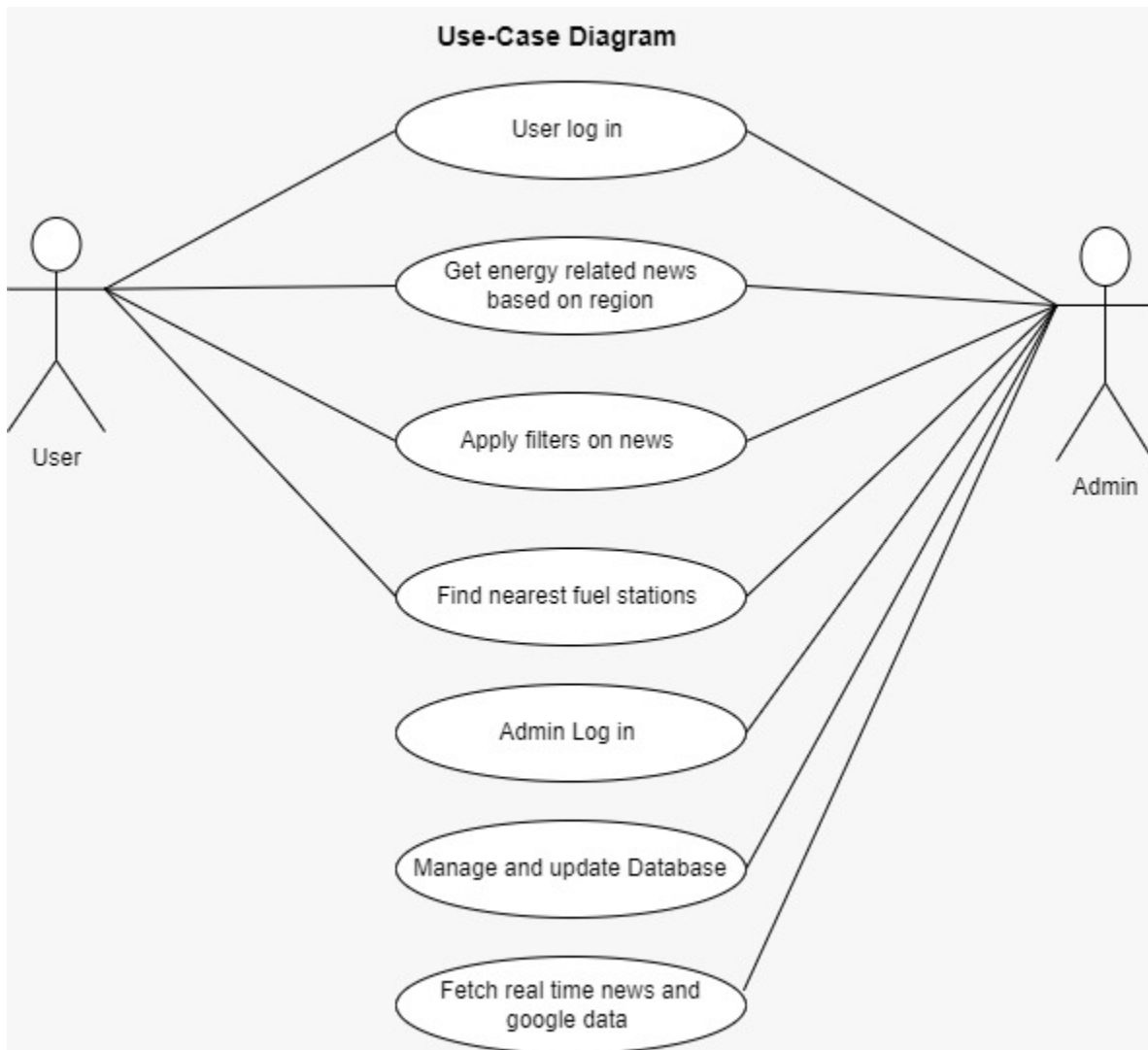The non-functional requirements are as follows:

1. **Performance:** The app should load news articles and map data within 2 seconds on average.
    - It should be able to handle concurrent user requests with minimal latency.
    - Response times for interactions (e.g., liking an article) should be under 1 second.
2. **Scalability:** The app should be able to scale horizontally to accommodate increasing user traffic.
    - Scalability should be seamless, with the ability to add new servers or resources as needed.
    - Database scalability should support the growth of news articles and user data.

3. **Availability:** The app should aim for 99.9% uptime. Implement failover and redundancy mechanisms to ensure service availability in case of server failures.

4. **Security:** Data transmission should be encrypted using industry-standard protocols (e.g., TLS) to protect user data.
   - Implement proper authentication and authorization mechanisms to ensure data privacy.
   - Regularly conduct security audits and penetration testing to identify and address vulnerabilities.

5. **Reliability:** Minimize system downtime and errors by conducting thorough testing and quality assurance.
   - Implement proper error handling and logging to facilitate debugging and issue resolution.

3.   System Features

3.1   Users

3.2   Use-Case Diagram

3.3   ER Diagram